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REVIEW ARTICLE

Substance Use Among Lawyers and Law Students: A Scoping Review

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Introduction: Lawyers are uniquely vulnerable to substance use and disorders due to the use of different substances mainly because of the demanding and adversarial nature of the legal profession. Substance use often begins during law school years.
Aims: This study aims to examine substance use and disorders due to the use of different substances.
Methods: A scoping review was adopted to collect literature from January 2000 to November 2023. The review followed the Arksey and O'Malley framework. Literature was retrieved from CINAHL Complete, PubMed, PsycINFO, Web of Science, and Scopus. A total of 1,808 studies were retrieved and 14 were included for the final synthesis. The combined sample size was 16,722, comprising 15,150 lawyers and 1,572 law students. Data was extracted into a data matrix and then synthesized into the results.
Results: Many lawyers and law students have experienced substance use disorders or problematic use. Alcohol and tobacco were the most used substances among them. Suicide due to substance use was also detected. Findings reveal the use of illicit substances, demographic disparities in substance use, and unprofessional behavior such as substance use during working hours. The role of support systems in battling substance use was critical among lawyers and law students. Even though few lawyers sought help for substance use related issues, treatment was effective.
Conclusions: Substance use is pervasive in the legal profession. Although various health promotion and education interventions have been carried out to address this problem, the scale of the problems means that stakeholders must do more to effectively tackle the issue.

Keywords: substance use, alcohol drinking, tobacco use, lawyers, legal profession, and law students

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Introduction

Substance use refers simply to the act of consuming substances like alcohol, tobacco, or drugs, without implying whether this use is responsible or harmful (Volkow & Blanco, 2023; American Psychiatric Association, 2014). Disorders due to the use of different substances result when substance use becomes harmful, leading to negative outcomes such as health problems, risky behaviors, or neglect of responsibilities (Kalin, 2020; WHO, 2023). Episodes of harmful use occur when an individual struggles to control the use of substances despite experiencing adverse consequences (Volkow & Blanco, 2023; WHO, 2023). The most severe forms of disorders due to the use of different substances are harmful patterns of use and dependence (Volkow& Blanco, 2023; WHO, 2023).

Substance use could potentially lead to severe mental illness (Shegaw et al., 2022). This can be a public health problem even when it does not rise to the level of disorders due to the use of different substances (Shegaw et al., 2022; Volkow & Blanco, 2023).

Almost a quarter of the world's population uses tobacco, resulting in a tobacco epidemic (WHO, 2021). This tobacco epidemic, according to the World Health Organization, is one of the biggest public health challenges in the world (WHO, 2021). Tobacco kills over eight million people a year, with about 75% of this case-specific mortality due to direct tobacco use and 25% of the mortality among non-smokers who are exposed to tobacco smoke (WHO, 2021). According to the World Health Organization, about 35 million people are affected by substance use problems annually (WHO, 2024). Also, three million yearly deaths are attributed to alcohol, implying that alcohol-related disorders account for 5% of deaths across the world (WHO, 2024). A recent study showed that 3.7% of all Disability-Adjusted Life Years (DALYs) were associated with alcohol use (Murray et al., 2020). Additionally, 7.9% of all DALYs were attributed to tobacco smoking (Murray et al., 2020). In other words, a total of 11.6% of the global disease burden is associated with alcohol drinking and tobacco smoking (Murray et al., 2020).

Given the ominous global burden of substance use, it is important to examine the problem among segregated, at-risk populations. Certain professionals are known to be more susceptible to problematic substance use than others. A Hungarian study underscored this point by suggesting that law enforcement students averaged a higher incidence of caffeine use disorder than the general population (Erdős, 2023). Attorneys, or lawyers, are one of the at-risk populations for problematic substance use (Rothstein, 2008). This is largely due to the adversarial and "winner-takes-all" nature of lawyering and the stress associated with the work (Rothstein, 2008). Often, the legal profession is a zero-sum game, putting immense pressure on attorneys to deliver results (Rothstein, 2008). In their quest to meet client demands, some attorneys use alcohol and other forms of substances as a coping mechanism (Rothstein, 2008; Wyler et al., 2022).

Lawyers are meant to be custodians of the law, and many of the substances that lawyers use are illegal in many jurisdictions (Rothstein, 2008). This portends a worrying concern – the people tasked with upholding the law break it (Rothstein, 2008). Furthermore, society is at risk of chaos if the mental health and well-being of lawyers spirals out of control (Organ et al., 2016). Lawyers ensure the rule of law, which is a cornerstone of every well-functioning society, including democracies and monarchies alike (Organ et al., 2016). Among others, lawyers defend individual rights, ensure compliance with laws at local, national, and global levels, and advise governments on legislation (Organ et al., 2016). They advise in deal-making, create employment opportunities, and contribute to national GDPs (Organ et al., 2016; Rothstein, 2008). The role of lawyers cannot be overstated.

Evidence shows that American lawyers' misuse of different substances does not begin immediately after practicing but starts even before entering the profession(Organ et al., 2016; Wyler et al., 2022). This is likely a direct result of the general population starting to use substances like alcohol and tobacco in adolescence (Organ et al., 2016; Wyler et al., 2022; Volkow & Blanco, 2023). Therefore, this study seeks to determine the prevalence of substance use, such as alcohol, tobacco, and other substances among lawyers and law students. Also, this study explores disorders due to the use of different substances among the same population. The study maps out the extant evidence across the world. Furthermore, the study examines the factors underlying the use of these substances. Common attributes in the legal industry across the world mean that the results of this study can be applied universally.

Methods

A scoping review, also known as a systematic scoping review, was conducted to identify the prevalence of substance use, disorders due to the use of different substances, and their associated factors, among attorneys and

law students (Peters et al., 2015). We deemed the scoping review appropriate for this study because its aim was consistent with the rationale behind scoping reviews (Peters et al., 2015; Stern et al., 2020). The essence of scoping reviews is to broadly understand nascent research subjects (Stern et al., 2020). In this study, a scoping review allowed the researchers to search, retrieve, collect, and synthesize a vast array of literature on substance use and its associated factors among lawyers and law students.

The directories of Prospero, Figshare, and Open Science Framework (OSF) were searched to identify whether any protocol for a similar study existed or was in progress. With no relevant registration, this scoping review was developed following the Arksey and O'Malley framework. This study also conforms with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols (PRISMA-P) and the latest PRISMA Extension for Scoping Review Checklist (PRISMA ScR), which guided the structure and organization of the review (Tricco et al., 2018).

To ensure the robustness of this study, two frameworks were integrated. Since its inception about twenty years ago, Arksey and O'Malley's has been widely adopted by researchers in conducting scoping reviews (Westphaln et al., 2021). The framework's rigor has been well-established (Arksey & O'Malley, 2005; Daudt et al., 2013; Westphaln et al., 2021). Even though the framework has six stages, only the first five steps are required. The sixth stage is an extra step which researchers have the discretion to ignore. The other five stages of the Arksey and O'Malley framework are elaborated below. They include identifying the research question, identifying the relevant studies, selecting the studies to be included, charting the data as well as collating, summarizing, and reporting the findings (Arksey & O'Malley, 2005).

The Arksey and O'Malley framework was complemented by the PRISMA Extension for Scoping Reviews (PRISMA-ScR) (Arksey & O'Malley, 2005; Tricco et al., 2021). Just like the Arksey and O'Malley framework, PRISMA-ScR is a template for developing protocols for scoping reviews and meta-analysis (Tricco et al., 2021). Even though similarities exist between the Arksey and O'Malley framework and PRISMA-P, the latter one culminated in a PRISMA Scoping Review Extension Checklist (PRISMA ScR), which is a 27-item worksheet for conducting structured and organized reviews (Arksey & O'Malley, 2005; Daudt et al., 2013; Tricco et al., 2018; Levac et al., 2010). Following these 27 points enhanced the methodological rigor of this study. The items were integrated into the five stages of the Arksey and O'Malley framework.

Identifying the Research Question

The review question considered in this study was guided by the Population, Concept and Context (PCC) mnemonic (Peters et al., 2015). The population included lawyers and law students. It also included judges, barristers, solicitors, and prosecutors. The concept of interest was substance use, its disorders, its prevalence, its abuse as well as its associated factors. The context was global; the study was not limited to a geographical location. This culminated in the question for this review: "What are the prevalence and factors of substance use and abuse among lawyers and law students"?

Identifying Relevant Studies

The objective of the search strategy was to uncover published literature. A preliminary, restricted search of PsycINFO and PubMed was conducted to produce a general overview of studies on the subject. The key terms in the titles and abstracts of these articles, along with the index terms employed to describe these articles, formed the basis for constructing a comprehensive search plan. Five databases, including CINAHL Complete, PubMed, PsycINFO, Web of Science, and Scopus, were used for the search. Keywords – "substance use", "alcohol", "drugs", "prevalence", "factors", "law students" and "lawyers" – were composed into a search string. Some MeSH terms and synonyms were used in the final search string. An advanced search, limited to the search title, was conducted. The search was limited to the title of the studies to ensure the precision of the results. Before finalizing the search string and limiting the search to the title of the articles, multiple iterations of the keywords were run in PsycINFO and PubMed. Table 1 shows the database-specific search strings, including Booleans, wildcards, and truncations.

Table 1. Search strings used to retrieve studies from the various databases

Database	Search strings
PsycINFO	TI (amphetamine* OR substance OR alcohol OR tobacco OR cigarette OR drugs OR cannabis OR marijuana OR wee) AND TI (use OR abuse OR prevalence OR factors OR dependence OR addiction) AND TI (attorney* OR lawyer* OR "law student*" OR barrister* OR solicitor* OR judge* OR justice*)
PubMed	((amphetamine* OR substance OR alcohol OR tobacco OR cigarette OR drugs OR cannabis OR marijuana OR wee[Title]) AND (use OR abuse OR prevalence OR factors OR dependence OR addiction[Title])) AND (attorney*[Title] OR lawyer*[Title] OR "law student*"[Title] OR barrister*[Title] OR solicitor*[Title] OR judge*[Title] OR justice*[Title])
Scopus	(amphetamine* OR substance OR alcohol OR tobacco OR cigarette OR drugs OR cannabis OR marijuana OR wee) AND (use OR abuse OR prevalence OR factors OR dependence OR addiction) AND (attorney* OR lawyer* OR "law student*" OR barrister* OR solicitor* OR judge* OR justice*)
CINAHL Complete	TI ((amphetamine* OR substance OR alcohol OR tobacco OR cigarette OR drugs OR cannabis OR marijuana OR wee)) AND TI ((use OR abuse OR prevalence OR factors OR dependence OR addiction)) AND TI ((attorney* OR lawyer* OR "law student*" OR barrister* OR solicitor* OR judge* OR justice*))
Web of Science	TI=(((amphetamine* OR substance OR alcohol OR tobacco OR cigarette OR drugs OR cannabis OR marijuana OR wee) AND (use OR abuse OR prevalence OR factors OR dependence OR addiction) AND (attorney* OR lawyer* OR "law student*" OR barrister* OR solicitor* OR judge* OR justice*)))

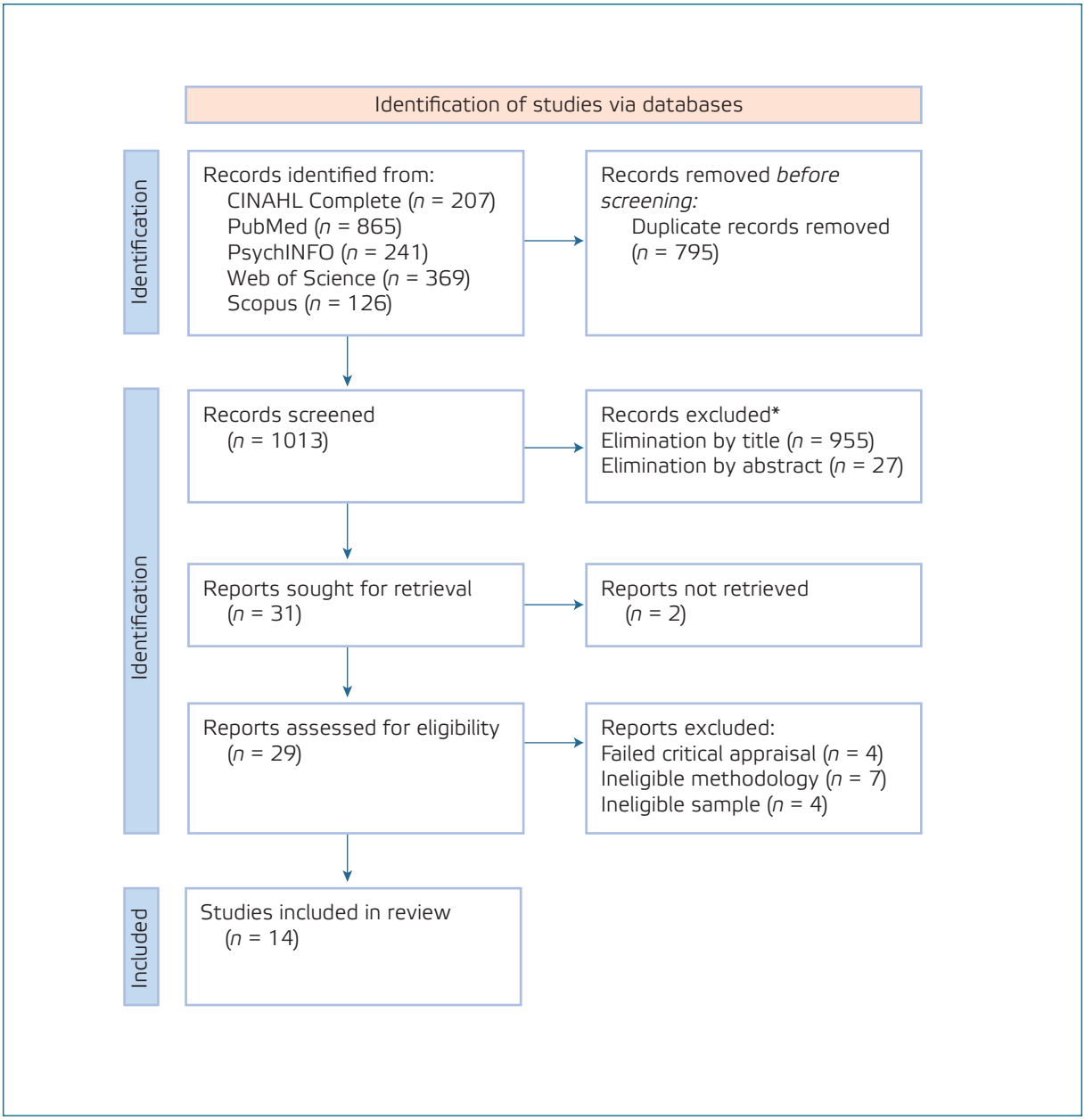
Study Selection

Studies were included in this scoping review if they were published in English. Studies that were published before January 2000 were excluded, while studies from January 2000 to November 2023 were eligible for inclusion. Editorials, narrative reviews, scoping and systematic reviews opinions, perspectives, books and book reviews, and conference abstracts were not included in this scoping review. Likewise, anecdotal and personal accounts were not included in this study. Various types of study designs, both quantitative and qualitative, were considered. Studies were included irrespective of their study site. Geographical locations were not a basis for exclusion because this was a global study.

After the search, all the studies were exported into Mendeley Reference Manager where duplicates were identified and merged. The studies were reviewed first by title, and then by abstracts; that is, studies whose titles and abstracts were not consistent with the purpose of this study were eliminated. The two researchers independently conducted the study selection process and any disagreements regarding whether to include a study were resolved through mutual agreement.

In total, 1,808 studies were retrieved from the five databases. Specifically, 207 were from CINAHL Complete, 865 were from PubMed, 241 were from PsycINFO, 369 were from Web of Science, and 126 were from Scopus. After removing duplicates, 1,013 studies remained. Afterwards, 955 studies were eliminated by title and an additional 27 were eliminated by abstract leaving 31 studies. Two full-text articles were not available. Fourteen studies were included in the final synthesis. Figure 1 is the PRISMA chart that summarizes the search process. Relevant findings from the included studies were extracted into a data matrix according to the author(s) and year of publication; the purpose of the study; methodology; sample; and key findings and recommendations. Table 2 shows the data matrix.

Figure 1. PRISMA diagram of identified studies



* Exclusions were manually performed without any automation tool.

Collating, Summarizing, and Reporting the Results

The collating, summarizing, and reporting procedure adhered to the reporting guidelines of the PRISMA Extension for Scoping Reviews (PRISMA-ScR) (Peters et al., 2015). A basic descriptive analysis was performed to establish the country setting, sample, and years in which the studies were published. The findings extracted from the data matrix were independently assigned codes. These codes were then compared and deliberated upon to establish an agreement between the researchers. Similar codes were merged into sub-themes, and related sub-themes were grouped into overarching themes, as detailed in the results section.

Table 2. Data matrix of the included studies

No	Author, date	Purpose of the study	Methodology	Sample	Key findings and recommendations
1.	Bogowicz et al., 2018	To establish the prevalence of substance use, including alcohol, among law and medical students in the United Kingdom	Cross-sectional study using standardized questionnaires. Alcohol Use Disorders Identification Test (AUDIT) scores were used to estimate alcohol abuse and dependence. Alcohol use disorder was identified by an AUDIT score of more than 8	353 law students, including 201 first-year students, 110 second-year students, and 42 third-year students in the UK	• The prevalence of smoking was as follows: first year (10.6%), second year (19.0%), and final year (12.5%) • Alcohol use disorders was highly prevalent among the law students: first year (67.2%), second year (69.5%), and final year (47.4%) • Alcohol dependence was present in about 10% of the first-year and second-year law students • Current prevalence of substance use, determined by usage within the past year, was 39.1%, 42.4% and 18.9% among the first-year, second year and third-year law students respectively • Cannabis was the most commonly used substance among the law students and this was followed by cocaine and nitrous oxide • Overall, law students recorded a higher prevalence of smoking and alcohol use disorder than medical students at all levels
2.	Buick, 2000	To determine the prevalence of substance and its relations with stress and depression among law students	Longitudinal study sampling students using four standard instruments, including the Core Alcohol and Drug Survey	244 law students in private law schools in Northeastern America. The sample comprised of 178 full time students and 66 part time (evening) students.	• In the two weeks preceding the study, 35% of the students had more than five drinks at a sitting • Students who had lower scores on the Beck Anxiety Inventory less than five drinks at a sitting and those who recorded higher scores had more than five drinks at a sitting • 20% of the students used marijuana at least three times a week • Majority of the students started consuming alcohol and marijuana before they turned 18 years. By contrast, majority of the students started using cocaine, amphetamines, sedatives, and hallucinogens after they turned 18 years • Students who started using cocaine before their 18th birthday had significantly higher Brief Symptom Inventory scores • A significant correlation and a small percentage variance was established between family history of alcohol and drug use and Beck Depression Inventory II
3.	Chrobak-Kasprzyk and Jośko-Ochojska, 2020	To assess risky drinking, harmful drinking and alcohol addiction among Polish lawyers	A cross-sectional study using the AUDIT	206 lawyers—102 women and 104 men in Poland	• 3% of the lawyers had problems of alcohol addiction • 22.33% of the lawyers were at risk of risk drinking, harmful drinking and alcohol addiction • Male lawyers were significantly more likely to consume alcohol than female lawyers • Even though the number of work hours did not show a statistically significant relationship with alcohol consumption, alcohol consumption decreases with age • Lawyers who were married were significantly less likely to consume alcohol than lawyers who were not married. • Likewise, lawyers who had children were significantly less likely to consume alcohol than lawyers who did not have children
4.	Gupta et al., 2019	To determine the prevalence and associated factors of tobacco use among law students in Indore City	A descriptive cross-sectional study	278 law students in India	• Higher proportion of students consumed tobacco by smoking than smokeless tobacco: 32% smoked tobacco and 2.5% consumed smokeless tobacco. • 66.5% of the students consumed tobacco under peer pressure • Only 6.5% of the students considered smoking tobacco whereas 23.4% of the students indicated that they were not interested in quitting tobacco consumption • Male law students were about two times more likely to consume tobacco than female students • Students who have a family history of tobacco consumption were three times more likely to consume tobacco than their peer who had no history of tobacco smoking • Cigarettes (24.8%) and hookah (5.8%) were the most common tobacco that the students smoked • The most commonly used smokeless tobacco were: gutka (0.7%), chewing tobacco (0.4%), dip (0.4%), and betel quid with tobacco (0.4%) • Majority of the students started smoking tobacco from ages 14 to 20 • The prevalence of alcohol consumption among the students was 26.6%

(continued on the next page)

Table 2. continued

No	Author, date	Purpose of the study	Methodology	Sample	• Key findings and recommendations
5.	Krill et al., 2016	To examine the use of substance among attorneys	Cross-sectional survey using the Alcohol Use Disorders Identification Test	12,825 licensed and employed attorneys in the United States of America	• 20.6% of the attorneys had problematic drinking • 36.4% of the attorneys had scores which reflected hazardous drinking or possible abuse or dependence • Attorneys who were younger than 31 years old were more likely to have clinically significant drinking than their older colleagues • Those who have been practicing for more than ten years were less likely to record clinically significant scores than those who have been practicing for less than ten years. • Attorneys who were less than 31 years old were more likely to consume more alcohol than those who were more than 30 years old • Alcohol was the most commonly used substance (84.1%), followed by tobacco (16.9%), sedatives (15.7%), marijuana (10.2%), opioids (5.6%), stimulants (4.8%), and cocaine (0.8%) • 6.8% of the attorneys reported that they previously sought treatment for alcohol and/or drug use. Out of this, 21.8% indicated that they used intervention that are meant for legal professionals • Those who reported using tailored interventions recorded lower AUDIT scores than those who did not use programs tailored to attorneys • 44.2% of those who ever sort treatment and 23.4% of those who never sort treatment reported that confidentiality and privacy were barriers to treatment-seeking behavior
6.	Leignel et al., 2014	To examine the level of substance use among self-employed attorneys. The study also examined the level of substance use among pharmacists as well as mental health and risk factors of psychological distress among self-employed attorneys and pharmacists	Cross-sectional survey using self-reported questionnaires	A total of 1282 self-employed lawyers responded to the survey, out of a sample of 3600 lawyers from the Paris area, France	• Even though the average number of drinks (alcohol) was significantly higher among pharmacists than lawyers, the prevalence of alcohol use was significantly higher among lawyers than pharmacists (53% v 44%) • 16% of the lawyers reported alcohol abuse • 11% of the lawyers reported using drugs (anxiolytic, antidepressants, and hypnotic) • Specifically, 5% used anxiolytic drugs, 4% used antidepressants, and 1% used hypnotic drugs • The prevalence of tobacco smoking among the attorneys was 26%. This was compared to 13% prevalence among pharmacists and the difference was statistically significant • Use of any drug (aOR=2.56), use of anxiolytic drugs (aOR=4.69), use of hypnotic drug (aOR=4.4) and tobacco smoking (aOR=1.5) predicted poor mental health among the lawyers
7.	Murdoch, 2004	To examine the alcohol and substance use among law students	Cross-sectional study using Drug Abuse Screening Test and Michigan Alcoholism Screening Test	216 completed questionnaires of a sample of 229 law students University of British Columbia, Vancouver, Canada	• 37.2% of the students recorded potential alcohol dependence and abuse • 7.6% reported potential drug abuse and dependence
8.	Reed et al., 2016	To examine, among other things, the level of substance use among law students	A combination of cross-sectional study and longitudinal study, with two follow-ups at four months intervals	375 law students in the Midwestern part of the USA	• The prevalence of alcohol consumption within the past 30 days was 84.6% and 90.4% consumed alcohol within the past year • On average, students reported having 4.31 drinks per week, and 51% reported having at least five drinks per week (binge drinking) • 11.7% smoked marijuana, 8.7% used sedatives, 4.8% used prescription drugs without prescription, and 1% used cocaine within the past year • No significant difference were observed in substance use within the law students according to their class groups • There were no changes in the longitudinal data—the level of substance use among 1Ls did not significantly change over their first year of study

(continued on the next page)

Table 2. continued

No	Author, date	Purpose of the study	Methodology	Sample	• Key findings and recommendations
9.	Rosky et al., 2022	To determine the difference in substance use among law students who took "Mindfulness Training" and those who did not it	Non-randomized, quasi-experimental study involving control groups	61 law students in Utah, USA—31 cases and 33 controls	• The intervention group recorded an average score of 4.9 on the alcohol scale at baseline and the comparison group recorded a score of 3.0 at baseline • At time 2, the average disordered alcohol score for the intervention group was 3.8 and the average score for the comparison group was 3.3 • There were significant differences between the intervention group and the comparison group concerning the disordered alcohol use outcomes. On average, individuals participating in the mindfulness course exhibited more substantial decreases in alcohol misuse behaviors and related problems compared to those in the comparison group. [$F(1, 62) = 6.858$, $p = .011$, d = 0.67]
10.	Seear, 2023	To reflect on substance use addiction among lawyers	Exploratory qualitative study	48 Australian lawyers	• Addiction is the principal effect of legal strategy • Alcohol use addiction is a "genuine" problem in the legal industry • Alcohol addiction is a major influencer of family violence
11.	Seear, 2017	To explore the experience of lawyers regarding alcohol use	Exploratory qualitative study	23 lawyers from Australia and Canada—7 from Australia and 16 from Canada	• Lawyers play the role of quasi-expert on alcohol addiction in four main ways • First, they play this role when they decide on which prospective client to accept as a client • Second, they play this role when they advocate for a client in court • Third, they play this role when they settle disputes on behalf of their clients • Fourth, they play this role when in the process of developing cases
12.	Shore, 2001	To establish the linkage between drinking and type of practice	Cross-sectional study	559 attorneys from two midwestern cities in US	• The average amount of any kind of alcoholic drink consumed daily was 10.94 ml (0.37 oz of absolute alcohol) • Women were less likely to drink than men [$F(1, 553) = 17.14$, $p < .001$] • There was no significant relationship between type of practice and alcohol consumption • 31.8% of the participants had drinks while conducting business • The average number of occasions that the participants had drinks while conducting business was 2.7 and the average number of drinks consumed per occasion was 2.32 • Drinking while conducting business according to practice type are also follows: practice group (61.0%), solo (78.6%), government (87.6%), and corporate (80.0%). This difference was statistically significant • 68.9% of the participants drank during social events related to work • The average number of occasions that the participants drank during social events was 4.08 and the average number of drink per occasion was 3.43
13.	Stack & Bowman, 2023	To establish a relationship between suicide among lawyers and substance use	Secondary analysis of 2003 to 2006 data from the CDC's National Violent Death Reporting System	30,570 cases, out of which 132 were lawyers, from 17 US states	• 15.2% of lawyers who committed suicide had known substance or drug abuse issues. This is compared to 23.7% of nonlawyers who committed suicide with known substance or drug abuse problems, and the difference is statistically significant
14.	Sweeney, 2004	To examine the treatment outcomes of attorneys with substance abuse disorders	Analysis of secondary clinical data from 1994 to 2002	75 cases from Florida	• 57% of the attorneys were treated for alcohol abuse, 25% for cocaine abuse, 8% for opiates abuse, 3% each for benzodiazapenes, GHB and methamphetamine, and 1% for marijuana • The average length of treatment for substance abuse was 10.6 weeks (one day to nine months as the range) • The overall completion rate of treatment was 64% • A special program, the Recovering Attorneys' Program was instituted in 1999. The completion rate before the program was 47% and the completion rate after the program was 79%

Results

Characteristics of the Study

The combined sample from the 14 included studies was 16,722, comprising 15,150 lawyers and 1,572 law students. Out of the included studies, 7 (50%) were conducted in the USA. One study each was conducted in the UK, Poland, France, India, and Australia. The remaining one study was a multi-country study which sampled participants from Canada and Australia.

The highest number of included studies was published in 2004, 2016 and 2023. One study each was published in 2000, 2001, 2017, 2018, 2019, and 2020. No studies were published from 2005 to 2013.

Prevalence of Substance Use Among Lawyers and Law Students

Fewer studies investigated the prevalence of alcohol consumption among lawyers than among law students. In France, 53% of lawyers consumed alcohol according to a study by Leignel et al. (2014). The lifetime prevalence of alcohol use among some British law students ranged from 47.4% to 69.5% with final-year law students accounting for the lowest and second-year students accounting for the highest (Bogowicz et al., 2018). Prevalence within the past year was lower among law students; it was as low as 18.9% and as high as 42.4% (Bogowicz et al., 2018). In India, 26.6% of law students consume alcohol (Gupta et al., 2019). A higher lifetime prevalence of alcohol use – 90.4% – was recorded among law students in the midwestern part of the US (Reed et al., 2016). The highest current prevalence of alcohol consumption was recorded among students in the Midwestern United States of America: 84.6% (Reed et al., 2016).

The findings also demonstrated the frequency of alcohol use. The average amount of any kind of alcoholic drink consumed daily by lawyers in two midwestern cities in the United States was 10.94 ml (Shore, 2001). This translated to a daily average of 0.37 oz of absolute alcohol (Shore, 2001). Even though about 32% of these lawyers drank during business hours, most of the drinking, about 70%, occurred during social events (Shore, 2001). Additionally, in Northeastern America, 35% of law students reported that they had more than five drinks per occasion (Buick, 2000). More than half of the law students in another American sample consumed at least five drinks per week (Reed et al., 2016). This, according to the authors, constituted binge drinking (Reed et al., 2016). On average, a lawyer drank about 4 drinks per social occasion (Shore, 2001).

The studies also reported findings on the prevalence of tobacco smoking among law students and lawyers. The prevalence of tobacco smoking among French attorneys was 26% (Leignel et al., 2014). In the United Kingdom, the prevalence of smoking among law students ranges from 10.6% to 19.0% with first-year law students recording the lowest prevalence and second-year law students recording the highest prevalence (Bogowicz et al., 2018). A longitudinal study among law students in the northeastern part of the United States America (USA) found that one out of every five students smoked or consumed marijuana at least three times weekly (Buick, 2000). About one out of every ten French lawyers used drugs such as anxiolytics, antidepressants, and hypnotics (Leignel et al., 2014).

Regarding the onset of substance use, most U.S. law students started using alcohol before they turned 18 years old (Buick, 2000). By contrast, most law students in the same study started using cocaine, amphetamines, sedatives, and hallucinogens after their 18th birthday (Buick, 2000).

Substance Use Problems Among Lawyers and Law Students

A cross-sectional study to screen for alcohol use disorders among U.S. lawyers established that one out of every five participants engaged in problematic drinking (Krill et al., 2016). Additionally, 36.4% of the attorneys exhibited scores that reflected hazardous drinking or possible abuse or dependence (Krill et al., 2016). A similar study conducted among Polish lawyers found that 22.3% of lawyers were at risk of alcohol addiction (Chrobak-Kasprzyk & Jośko-Ochojska, 2020). According to another study in Poland, 3% of lawyers were battling alcohol addiction (Buick, 2000). Using self-administered questionnaires, researchers observed alcohol abuse among 16% of French lawyers (Leignel et al., 2014).

In Canada, a cross-sectional study using the Drug Abuse Screening Test and Michigan Alcoholism Screening Test revealed that 37.2% of law students registered potential alcohol dependence and abuse (Murdoch, 2004). Also, potential drug abuse was observed in 7.6% of the law students (Murdoch, 2004). In the United Kingdom, clinical levels of alcohol dependence were observed among 10% of law students (Bogowicz et al., 2018).

Commonly Used Substances Among Lawyers and Law Students

Without factoring in alcohol, tobacco was the most used substance among U.S. attorneys (Krill et al., 2016). About 6% of the attorneys used opioids (Krill et al., 2016). Findings from a secondary analysis of clinical data, collected in Florida, revealed that about one in every four lawyers used cocaine (Sweeney et al., 2004). Pertaining to law students, cannabis was the most used substance among British law students (Bogowicz et al., 2018). This was followed by cocaine and nitrous oxide (Bogowicz et al., 2018). Cigarettes were the most used substance among Indian students, and this was followed by hookah (Gupta et al., 2019). Marijuana was the most used substance among some U.S. students (Reed et al., 2016). About 1% of the students used cocaine (Reed et al., 2016).

Factors, Drivers, and Health Effects of Substance Use Among Lawyers and Law Students

Male lawyers were more likely to consume alcohol than female lawyers (Chrobak-Kasprzyk & Jośko-Ochojska, 2020; Gupta et al., 2019). Alcohol consumption and the likelihood of problematic drinking decreases with age (Chrobak-Kasprzyk & Jośko-Ochojska, 2020; Krill et al., 2016). The number of hours that attorneys worked did not show a significant relationship with alcohol consumption (Chrobak-Kasprzyk & Jośko-Ochojska, 2020). Lawyers who were married, and also lawyers who had children, were less likely to consume alcohol (Chrobak-Kasprzyk & Jośko-Ochojska, 2020).

Family history had a relationship with substance use among law students (Buick, 2000; Gupta et al., 2019). Indian law students who had a family history of tobacco use were three times more likely to use tobacco than those who did not have a family history of substance use (Gupta et al., 2019). Likewise, a family history of substance use was associated with substance use among American law students (Buick, 2000).

Law students who had more than five drinks per occasion were more likely to show higher mean scores on the Beck Depression Inventory II than law students who had less than five drinks per occasion (Buick, 2000). The onset of cocaine usage before the age of 18 years increased the clinical symptoms associated with its use (Buick, 2000). These included symptoms of interpersonal sensitivity, anxiety, hostility, phobic anxiety, psychoticism, obsessive-compulsive, paranoid ideation and somatization (Buick, 2000). Peer pressure accounted for 66.5% of tobacco use among law students in India (Gupta et al., 2019).

Substance use did not only contribute to sickness among lawyers, but also to death. Substance abuse accounted for 15.2% of suicides among lawyers (Stack & Bowman, 2023). Alcohol addiction among attorneys was attributed to legal strategy (Seear, 2023). Alcohol addiction reflects throughout the legal process (Seear, 2017). Its impact is felt from client intake through the litigation process and other parts of the life cycle of a lawsuit (Seear, 2017, 2023).

Treatment and Interventions

Only about 7% of attorneys sought treatment for their substance use problems (Krill et al., 2016). Treatment and substance use interventions produced results (Rosky et al., 2022; Sweeney et al., 2004). The average duration of treatment for substance use was eleven weeks (Sweeney et al., 2004). Those who sought treatment were less likely to record clinically significant levels of substance use than their peers who did not seek treatment (Krill et al., 2016). Special interventions that are tailored to the substance use needs of lawyers resulted in about a 80% treatment completion rate (Sweeney et al., 2004). By contrast, the completion rate of treatment for substance use among the lawyers before the special intervention was 47% (Sweeney et al., 2004).

Discussion

The lowest prevalence of alcohol among law students was recorded in India (26.6%) and the highest prevalence of alcohol use was observed among midwestern students in the United States (90.4%). Among lawyers, a French study established that the prevalence of alcohol consumption was around 53%. The findings from this study largely differ from findings in previous studies that investigated the prevalence of alcohol use among lawyers and law students. A study in the 1990s found that the lifetime prevalence of alcohol consumption among lawyers and law students was 82% and 75% respectively in the United States (Organ et al., 2016). The prevalence of alcohol consumption within the profession has not substantially changed even though various efforts have been aimed at

reducing the prevalence of alcohol use in the profession indicates that a lot of work remains to be done (Rothstein, 2008). Perhaps the prevalence of alcohol use steadied due to these interventions, but the consensus is that more needs to be done to stem alcohol consumption among lawyers (Organ et al., 2016; Rothstein, 2008).

The difference in alcohol consumption observed among law students in India and the United States is not surprising. Within the general population, patterns of alcohol consumption in India and the United States differ. The prevalence of alcohol consumption in the general population in India is about 60% lower than the prevalence of alcohol consumption in the United States, and these differences likely accounted for the differences among law students too (Sivapuram et al., 2020; NIAAA, 2024). Based on the findings of this study and the findings among the general population of India and the United States, the prevalence of substance use among university students is higher compared to the general population (Sivapuram et al., 2020; NIAAA, 2024; Reed et al., 2016; Gupta et al., 2019). This underscores a unique alcohol use among law students.

The findings on alcohol use-related disorders demonstrate the susceptibility of lawyers and law students to problematic alcohol use. Over 50% of American lawyers engaged in binge drinking, which is more than the prevalence of binge drinking among the general public ((Reed et al., 2016 ; Cheng et al., 2015). Predictably, depressive symptoms were common among some American law students who consumed more than five drinks in one sitting (Buick, 2000).

Substance use did not only result in morbidity among some lawyers, but it also contributed to mortality in certain cases. Substance abuse accounted for 15.2% of the suicides among lawyers (Stack & Bowman, 2023). Alcohol addiction among attorneys was attributed to legal strategy (Seear, 2023). Alcohol addiction reflects throughout the legal process (Seear, 2017). Its impact is felt from client intake through the litigation process and other parts of the life cycle of a lawsuit (Seear, 2017, 2023). Various forms of problematic drinking were observed among a substantial proportion of the lawyers (Chrobak-Kasprzyk & Jośko-Ochojska, 2020; Krill et al., 2016). The finding on problematic alcohol consumption in the U.S, among lawyers is higher than the prevalence of problematic alcohol drinking among physicians in the U.S., which was recorded at 16.8% (Halsall et al., 2023). Likewise, the proportion of U.S. nurses who engaged in problematic drinking was 27.0% (Halsall et al., 2023). Similarly, the proportion of lawyers engaged in problematic drinking was over three times the proportion of the general American population that was engaged in problematic drinking (NIAAA, 2024; Krill et al., 2016). In sum, the legal profession seems to be confronted with a peculiar, cultural challenge regarding alcohol consumption.

This situation is worrying, especially since our study established that 30% of lawyers drink during business hours (Shore, 2001). The majority of drinking by lawyers is done outside working hours, but there is a risk that drinking during work hours could become a norm. Another worrying observation on substance use among lawyers was that the problem is resulting in deaths. Substance abuse accounted for 15.2% of suicides among lawyers (Stack & Bowman, 2023). This represents a substantial proportion of lawyers who lose their lives due to substance use.

Findings were also made on the prevalence of tobacco smoking among lawyers and law students, which ranged from 10.6% among British law students to 26% among French lawyers (Leignel et al., 2014; Bogowicz et al., 2018). This finding is generally consistent with tobacco smoking among the public, including other professionals. Global and regional studies have demonstrated that the average prevalence of tobacco smoking is about 18% (Cornelius et al., 2022; Nilan et al., 2019; WHO, 2019). It does not appear, therefore, that lawyers and law students have peculiar issues with tobacco use.

Instances of using illegal substances also occurred. In the United States, some lawyers and law students use contraband substances such as cocaine and cannabis (Bogowicz et al., 2018; Buick, 2000; Krill et al., 2016; Sweeney, 2004). This is a concern as lawyers are meant to be the custodians of the law (Rothstein, 2008). For this reason, the law is a self-regulating profession in many jurisdictions (Rothstein, 2008). Here, the findings showed that not all lawyers, and aspiring lawyers, are accountable to themselves. Some lawyers break the law to suit their cravings. There were likely more lawyers and law students who engaged in the use of illicit substances than those who reported doing so. People are not always candid about subjects like substance use (Aidam & Adawudu, 2023).

This study also highlighted drivers and associated factors of substance use among lawyers and law students. Male lawyers were more likely to consume alcohol than female lawyers. Various mainstream studies have established a relationship between substance use and gender (Cornelius et al., 2022; Degenhardt et al., 2018; Htet et al., 2020; Lorant et al., 2013; Nilan et al., 2019; WHO, 2019). This finding was, therefore, not surprising. Lawyers are a subset of society. It makes sense that certain observations on the association between demographic

characteristics and substance use in the general society were reflected among lawyers. Additionally, this study proved that alcohol consumption and the likelihood of problematic drinking decreases with age. The explanation could be that older lawyers, who are likely more experienced, learn how to manage alcohol consumption over time (Berger & Zhang, 2016; Coulton et al., 2012; Shaw et al., 2012). Reasons such as risk-taking, experimentation, social pressure, positive expectations and inadequate support systems could explain why younger attorneys consume more alcohol than older attorneys (Gray & Brown, 2009; Wild et al., 2001; Veerbeek et al., 2019).

The role of social systems in alcohol use among lawyers was underscored in this study in two respects. First, it was discovered that the marital status of lawyers had a significant relationship with alcohol consumption in the sense that lawyers who were married, and also, lawyers who had children, were less likely to consume alcohol. Second, a family history of substance use increased the likelihood of substance use among law students. These two findings are consistent with the extant literature on the role of social support and family history regarding substance use (Birkeland et al., 2021; Lookatch et al., 2019; Polcin & Korcha, 2017). Social support systems, such as spouses, can make a difference in substance use (Birkeland et al., 2021; López et al., 2021). Also, children can motivate parents to avoid potentially destructive behavior such as substance use (Birkeland et al., 2021; Lookatch et al., 2019; Polcin & Korcha, 2017). Conversely, a family history of substance use encourages people, including law students and lawyers, to do likewise (Beaulieu et al., 2021; Birkeland et al., 2021; Lookatch et al., 2019).

This study also proved that interventions targeting the prevention of substance use are effective. Lawyers who participated in such interventions experienced improvements in their mental health and wellbeing (Sweeney, 2004). This finding supports the established view that substance use problems are not death sentences; they are treatable (Baldwin, 1991; López et al., 2021). Substance use prevention programs, especially vertical programs, were effective in creating awareness among lawyers and law students as well as improving their mental health seeking behavior (Baldwin, 1991; Beaulieu et al., 2021; López et al., 2021). The effectiveness of substance use interventions gives hope to lawyers who are battling any form of problematic substance use.

Strenghts and Limitations

This study is the first to investigate substance use among lawyers and law students on a large scale using a rigorous methodology. The study includes literature from different parts of the world, describing various substances. This study is not without limitations. Eliminating a bulk of studies that were initially retrieved because they were not peer-reviewed articles resulted in the relative lack of a high volume of studies on the subject. Also, even though the aim of scoping reviews is to provide an overall overview of the subject rather than a detailed insight into a specific geographical location, the patterns of changes in substance use over time and varying socio-demographic factors make it difficult to compare findings across different geographical locations and timelines. Furthermore, most of the studies used screening tools to collect data in cross-sectional studies. A more accurate source of data would have been a secondary analysis of clinical data. Finally, this study included only studies that were published in English. As a result, certain studies that were published in other languages may have been omitted.

Conclusion, Implications and Future Directions

Substance use has morphed into a cultural and historical problem in the legal profession. Because of the critical role that lawyers play in society, their substance use issues can be consequential for themselves, their families, and even society. A substantial portion of lawyers drink during work hours, which is an indictment of their professionalism. Interventions that are tailored to the needs of lawyers are generally effective. There was a geographical imbalance in the available studies. This scoping review did not include any studies from the Middle East and Africa due to the paucity of literature on the subject in these regions. Also, analytical studies that use secondary data, collected from clinical sources, would present more accurate diagnostic data on substance abuse and disorders among lawyers and law students. Leaders in the legal profession should capitalize on these measures to stem the problem of substance use among lawyers. Some of these measures include lawyer assistance programs to help lawyers struggling with substance use, substance use health promotion and education, and regulating working hours. These interventions should be extended to law students because the problems start even before law students become lawyers.

List of abbreviations

OSF Open Science Framework
PCC Population, Concept and Context
UK United Kingdom
U. S. United States (of America)
WHO World Health Organization

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Author contribution

Kizito AIDAM: conceptualization, design, methodology, investigation, project administration, data management, formal analyses, interpretation, supervision, writing original draft, writing review, and editing.
Emefa A. ADAWUDU: conceptualization, methodology, investigation, formal analyses, interpretation, writing review, and editing.

Declaration of interest statement

The authors have no conflicts of interest to disclose.

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All data matrix has been added to the manuscript.

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References

Aidam, K., & Adawudu, E. A. (2023). Prevalence and Predictors of Substance Use Among Senior High School Students: An Institution-Based Cross-Sectional Study in Ghana. *Science Journal of Public Health*, *11*(6), 186–194. https://doi.org/10.11648/j.sjph.20231106.11

Baldwin, J. N. (1991). Treating Drug Problems, Volume 1: A Study of the Evolution, Effectiveness, and Financing of Public and Private Drug Treatment Systems. *American Journal of Health-System Pharmacy, 48*(5). https://doi.org/10.1093/ajhp/48.5.1104

Beaulieu, M., Tremblay, J., Baudry, C., Pearson, J., & Bertrand, K. (2021). A systematic review and meta-analysis of the efficacy of the long-term treatment and support of substance use disorders. *Social Science and Medicine*, *285*, Article 114289. https://doi.org/10.1016/j.socscimed.2021.114289

Berger, L., & Zhang, L. (2016). Substance Use and Street Violence: An Interview with Ruben Burgos, Senior Lecturer in Criminal Justice and Retired Police Lieutenant of the Milwaukee Police Department. *Journal of Social Work Practice in the Addictions*, *16*(1–2), 222–228. https://doi.org/10.1080/1533256X.2016.1141018

Birkeland, B., Weimand, B., Ruud, T., Maybery, D., & Vederhus, J. K. (2021). Perceived family cohesion, social support, and quality of life in patients undergoing treatment for substance use disorders compared with patients with mental and physical disorders. *Addiction Science and Clinical Practice*, *16*, Article 44. https://doi.org/10.1186/s13722-021-00252-8

Bogowicz, P., Ferguson, J., Gilvarry, E., Kamali, F., Kaner, E., & Newbury-Birch, D. (2018). Alcohol and other substance use among medical and law students at a UK university: a cross-sectional questionnaire survey. *Postgraduate Medical Journal, 94*(1109), 131–136. https://doi.org/10.1136/postgradmedj-2017-135136

Buick, W. P. (2000). Stress and Substance Abuse Among Law Students [Dissertation]. The University of Connecticut.

Cheng, H. G., Deng, F., Xiong, W., & Phillips, M. R. (2015). Prevalence of alcohol use disorders in mainland China: A systematic review. *Addiction*, *110*(5), 761–774. https://doi.org/10.1111/add.12876

Chrobak-Kasprzyk, K. S., & Jośko-Ochojska, J. (2020). Assessment of risky drinking, harmful drinking and alcohol addiction among lawyers. *Psychiatria Psychologia Kliniczna*, *20*(4), 259–266. https://doi.org/10.15557/PIPK.2020.0032

Cornelius, M. E., Loretan, C. G., Wang, T. W., Jamal, A., & Homa, D. M. (2022). Tobacco Product Use Among Adults – United States, 2020. *Morbidity and Mortality Weekly Report*, *71*(11), 397–405. https://doi.org/10.15585/mmwr.mm7111a1

Coulton, S., Newbury-Birch, D., Cassidy, P., Dale, V., Deluca, P., Gilvarry, E., Godfrey, C., Heather, N., Kaner, E., Oyefeso, A., Parrott, S., Phillips, T., Shepherd, J., & Drummond, C. (2012). Screening for Alcohol Use in Criminal Justice Settings: An Exploratory Study. *Alcohol and Alcoholism*, *47*(4), 423–427. https://doi.org/10.1093/alcalc/ags048

Degenhardt, L., Charlson, F., Ferrari, A., Santomauro, D., Erskine, H., Mantilla-Herrara, A., Whiteford, H., Leung, J., Naghavi, M., Griswold, M., Rehm, J., Hall, W., Sartorius, B., Scott, J., Vollset, S. E., Knudsen, A. K., Haro, J. M., Patton, G., Kopec, J., ... Vos, T. (2018). The global burden of disease attributable to alcohol and drug use in 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet Psychiatry*, *5*(12), 987–1012. https://doi.org/10.1016/S2215-0366(18)30337-7

Erdős, Á. (2023). Coffee, Energy Drinks Consumption and Caffeine Use Disorder Among Law Enforcement College Students in Hungary. *European Journal of Mental Health*, *18*, e0008. https://doi.org/10.5708/EJMH.18.2023.0008

Gray, M. K., & Brown, K. L. (2009). Drinking and drug use by college students: Comparing criminal justice majors and non-majors. *Journal of Criminal Justice*, *37*(3), 234–240. https://doi.org/10.1016/J.JCRIMJUS.2009.04.003

Gupta, S., Mishra, P., Nagarajappa, S., Kumar, S., & Lalani, A. (2019). Prevalence of Tobacco and associated risk factors among university law students in Indore City. *Indian Journal of Dental Research*, *30*(1), 10–14. https://pubmed.ncbi.nlm.nih.gov/30900649/

Htet, H., Saw, Y. M., Saw, T. N., Htun, N. M. M., Mon, K. L., Cho, S. M., Thike, T., Khine, A. T., Kariya, T., Yamamoto, E., & Hamajima, N. (2020). Prevalence of alcohol consumption and its risk factors among university students: A cross-sectional study across six universities in Myanmar. *PLoS ONE*, *15*(2), e0229329. https://doi.org/10.1371/journal.pone.0229329

Krill, P. R., Johnson, R., & Albert, L. (2016). The Prevalence of Substance Use and Other Mental Health Concerns among American Attorneys. *Journal of Addiction Medicine*, *10*(1), 46–52. https://doi.org/10.1097/ADM.0000000000000182

Leignel, S., Schuster, J.-P., Hoertel, N., Poulain, X., & Limosin, F. (2014). Mental health and substance use among self-employed lawyers and pharmacists. *Occupational Medicine*, *64*(3), 166–171. https://doi.org/10.1093/occmed/kqt173

Lookatch, S. J., Wimberly, A. S., & McKay, J. R. (2019). Effects of social support and 12-Step involvement on recovery among people in continuing care for cocaine dependence. *Substance Use & Misuse*, *54*(13), 2144–2155. https://doi.org/10.1080/10826084.2019.1638406

López, G., Orchowski, L. M., Reddy, M. K., Nargiso, J., & Johnson, J. E. (2021). A review of research-supported group treatments for drug use disorders. *Substance Abuse Treatment, Prevention, and Policy*, *16*, Article 51. https://doi.org/10.1186/s13011-021-00371-0

Lorant, V., Nicaise, P., Soto, V. E., & D'Hoore, W. (2013). Alcohol drinking among college students: College responsibility for personal troubles. *BMC Public Health*, *13*, Article 615. https://doi.org/10.1186/1471-2458-13-615

Murdoch, L. L. (2004). *Psychological distress and substance abuse in law students: The role of moral orientation and interpersonal style*. Simon Fraser University.

Murray, C. J., Aravkin, A. Y., Zheng, P., Abbafati, C., Abbas, K. M., Abbasi-Kangevari, M., ... & Borzouei, S. (2020). Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet*, *396*(10258), 1223–1249. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30752-2/fulltext

Nilan, K., McKeever, T. M., McNeill, A., Raw, M., & Murray, R. L. (2019). Prevalence of tobacco use in healthcare workers: A systematic review and meta-analysis. *PLoS ONE*, *14*(7), 1–26. https://doi.org/10.1371/journal.pone.0220168

Organ, J. M., Jaffe, D. B., & Bender, K. M. (2016). Suffering in Silence: The Survey of Law Student Well-Being and the Reluctance of Law Students to Seek Help for Substance Use and Mental Health Concerns. *Journal of Legal Education*, *66*(1), 116–156. https://jle.aals.org/home/vol66/iss1/13/

Peters, M. D. J., Godfrey, C. M., Khalil, H., McInerney, P., Parker, D., & Soares, C. B. (2015). Guidance for conducting systematic scoping reviews. *International Journal of Evidence-Based Healthcare*, *13*(3), 141–146. https://doi.org/10.1097/XEB.0000000000000050

Polcin, D. L., & Korcha, R. (2017). Social Support Influences on Substance Abuse Outcomes Among Sober Living House Residents with Low and Moderate Psychiatric Severity. *Journal of Alcohol and Drug Education*, *61*(1), 51–70.

Reed, K., Bornstein, B. H., Jeon, A. B., & Wylie, L. E. (2016). Problem signs in law school: Fostering attorney well-being early in professional training. *International Journal of Law and Psychiatry*, *47*, 148–156. https://doi.org/10.1016/j.ijlp.2016.02.019

Rosky, C. J., Roberts, R. L., Hanley, A. W., & Garland, E. L. (2022). Mindful Lawyering: a Pilot Study on Mindfulness Training for Law Students. *Mindfulness*, *13,* 2347–2356. https://doi.org/10.1007/S12671-022-01965-W

Rothstein, L. (2008). Law students and lawyers with mental health and substance abuse problems: Protecting the public and the individual. *University of Pittsburgh Law Review*, *69*(3), 531–566. https://doi.org/10.5195/LAWREVIEW.2008.106

Seear, K. (2017). The emerging role of lawyers as addiction 'quasi-experts'. *International Journal of Drug Policy*, *44*, 183–191. https://doi.org/10.1016/j.drugpo.2017.05.008

Seear, K. (2023). Making addicts: critical reflections on agency and responsibility from lawyers and decision makers. *Psychiatry, Psychology and Law*, *30*(1), 33–50. https://doi.org/10.1080/13218719.2022.2112099

Shaw, D., McCluskey, K., Linden, W., & Goodall, C. (2012). Reducing the harmful effects of alcohol misuse: The ethics of

sobriety testing in criminal justice. *Journal of Medical Ethics*, *38*(11), 669–671. https://doi.org/10.1136/medethics-2011-100304

Shore, E. R. (2001). Relationships between drinking and type of practice among U.S. female and male attorneys. *Journal of Social Psychology*, *141*(5), 650–659. https://doi.org/10.1080/00224540109600578

Stack, S., & Bowman, B. A. (2023). Suicide among lawyers: Role of job problems. *Suicide and Life-Threatening Behavior*, *53*(2), 312–319. https://doi.org/10.1111/sltb.12945

Stern, C., Lizarondo, L., Carrier, J., Godfrey, C., Rieger, K., Salmond, S., Apostolo, J., Kirkpatrick, P., & Loveday, H. (2020). Methodological guidance for the conduct of mixed methods systematic reviews. *JBI Evidence Synthesis*, *18*(10), 2108–2118. https://doi.org/10.11124/JBISRIR-D-19-00169

Sweeney, T. J., Myers, D. P., & Molea, J. (2004). Treatment for Attorneys with Substance Related and Co-Occurring Psychiatric Disorders: Demographics and Outcomes. *Journal of Addictive Diseases*, *23*(1), 55–64. https://doi.org/10.1300/J069v23n01_05

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., ... & Straus, S. E. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Annals of Internal Medicine*, *169*(7), 467–473. https://doi.org/10.7326/M18-0850

World Health Organization. (2021). *WHO Global Report on trends in the prevalence of tobacco use 2000-2025* (4th ed.). https://www.who.int/publications/i/item/9789240039322

World Health Organization. (2023). *International classification of diseases for mortality and morbidity statistics* (11th Revision). https://www.who.int/standards/classifications/classification-of-diseases

World Health Organization. (2024). *Global status report on alcohol and health and treatment of substance use disorder*. https://www.who.int/publications/i/item/9789240096745

Wild, T. C., Newton-Taylor, B., Ogborne, A. C., Mann, R., Erickson, P., & MacDonald, S. (2001). Attitudes Toward Compulsory Substance Abuse Treatment: A comparison of the public, conselors, probationers and judges' views. *Drugs: Education, Prevention and Policy*, *8*(1), 33–45. https://doi.org/10.1080/09687630124249

Wyler, H., Maisch, A., Berger, T., Kieser, U., Schleifer, R., & Liebrenz, M. (2022). Alcohol use disorder and disability insurance in Switzerland: the attitudes and views of lawyers, insurance medical experts, and addiction-specialist therapists. *Substance Abuse Treatment, Prevention, and Policy*, *17*, Article 69. https://doi.org/10.1186/s13011-022-00495-x

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PERSPECTIVE ARTICLE

Integration of Perinatal Mental Health into Maternal and Child Care: Progress and Challenges from the World Health Organization's Perspective

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Introduction: Perinatal mental health is essential for maternal and child well-being, and its promotion has the potential to improve health outcomes while reducing social and healthcare costs in both the short and long term. The World Health Organization (WHO) is making efforts to integrate mental health into maternal and child health services on a global scale.
Areas covered: Since 2001, the WHO has addressed mental health in its documentation, emphasizing the importance of safeguarding child health and supporting caregivers. However, perinatal mental health has primarily been developed within maternal and child health care strategies. The publication of the "Guide for Integration of Perinatal Mental Health in Maternal and Child Health Services" (2022) marks a significant advancement through providing specific recommendations for implementing perinatal mental health within healthcare systems.
Expert opinion: Despite these advances, integrating perinatal mental health into healthcare systems faces challenges, including the integration of care for fathers and families, training healthcare professionals, and considering women's lived experiences. Barriers include gender and age discrimination, mental health stigma, and deficiencies in healthcare infrastructure, particularly in low- and middle-income countries (LMICs).
Conclusion: Comprehensive maternal and child health care has the potential to improve maternal and child well-being while reducing long-term costs. To enhance perinatal mental health globally, it is essential to integrate it at all levels of healthcare, incorporating user experiences, strengthening professional training, and ensuring adequate resources within healthcare systems.

Keywords: World Health Organization, mental health, perinatal mental health, mother-child health, human rights

Introduction

The right to mental health is a fundamental human right, constituting an essential part of individuals' health and well-being; a key element for individual, community, and socio-economic development (WHO, 2006; WHO, 2022e; WHO, 2022f). The World Health Organization (WHO) is the United Nations agency responsible for promoting the highest possible level of health for all people, and its recommendations are critical in shaping healthcare system policies. Over the past quarter-century, the WHO has developed a framework to recognize, protect, and promote mental health, which has progressively incorporated the specificities of the perinatal period

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(WHO, 2022a). It is estimated that one in five women experience some form of mental health issue during pregnancy and/or the first year postpartum (WHO, 2022a). Scientific evidence has demonstrated that promoting maternal health and positive experiences during the perinatal period and early childhood yields short- and long-term benefits for both maternal and child health and well-being (United Nations, 2003; Powell et al., 2022; Roque et al., 2022). Additionally, perinatal mental health problems carry an extremely high economic burden, often requiring healthcare, social and judicial resources in the short and medium term (Conecta Perinatal, 2022). A 2014 study by the London School of Economics found that 28.0% of the additional costs are directed toward maternal care, while 72.0% are allocated to the care of children over their lifetimes (Bauer et al., 2014). This study estimates that the long-term costs of perinatal depression, anxiety disorders and psychosis reach £8.1 billion per birth cohort per year. Therefore, the early detection and treatment of perinatal mental health disorders can be highly cost-effective strategies for healthcare systems.

Despite this, perinatal mental health care remains insufficient in many regions of the world (Tripathy, 2020; Paricio del Castillo, 2024). In part, this is due to a historically prevailing approach to maternal and child health that focuses on mother-baby survival rather than on promoting well-being, given the dramatic maternal and infant mortality rates that still persist in many countries (WHO, UNICEF, UNFPA, 2023). However, with the arrival of the 21st century, the WHO has intensified its efforts to achieve the highest possible level of health and well-being for mothers and their babies, beyond mere survival. In parallel with the WHO's work, numerous authors have recognized the value of preventing and addressing maternal distress, and this has begun to materialize in clinical practice. In several countries, clinical practice guidelines have been implemented, encouraging obstetric and medical teams to assess the emotional state and stress adaptation of pregnant women. A notable example is the guideline issued by the National Institute for Health and Care Excellence (NICE) in 2007, which advocated for the routine evaluation of maternal mental health in the prenatal context (NICE, 2007).

This paper conducts the WHO's documentary review to outline the historical evolution of the organization protecting perinatal mental health and developing its comprehensive perinatal care model. The review also aims to assess the challenges faced and opportunities arising in healthcare systems worldwide in implementing the WHO's integrated maternal and child healthcare model.

WHO's Work in Protecting Perinatal Mental Health

The WHO has been a pioneering organization in recognizing the importance of mental health care within healthcare systems. In 2001, the WHO's annual report on world health addressed mental health for the first time in a dedicated monograph (WHO, 2001b). That same year, the "Mental Health Atlas" was published, a document that has since been updated several times, with the most recent version released in October 2021 (WHO, 2001a; WHO, 2021b). These documents marked a turning point through acknowledging the need for measures to reduce the burden of mental disorders and to improve the capacity of nations to respond to the challenges posed by these disorders' prevalence. The WHO highlighted that mental health issues incur significant economic costs and are inadequately resourced, further noting that individuals with mental disorders often suffer severe human rights violations.

In 2002, the 55th World Health Assembly endorsed the WHO's "Global Mental Health Action Programme", which placed mental health on the global public health agenda (WHO, 2002). Subsequently, in 2008, the WHO launched the "Mental Health Gap Action Programme" (mhGAP), aimed at low- and middle-income countries (LMICs), to expand mental health services by means of increasing financial and human resources through government and stakeholder commitments (WHO, 2008b). This program emphasized the integration of mental health care into non-specialized healthcare services, an approach that would later become crucial in developing the framework for perinatal mental health care. In that same year, under Bertolotto's leadership, the WHO convened a group of experts to analyze pregnant and postpartum women's mental health and its impact on child survival and well-being (WHO, 2008a).

Over a decade later, in 2019, the WHO launched the "Special Initiative for Mental Health (2019-2023): Universal Health Coverage for Mental Health", a five-year program backed by a $60 million investment aimed at ensuring affordable access to quality care for individuals with mental disorders in 12 priority countries (WHO, 2019).

In response to the 2012 World Health Assembly resolution on the global burden of mental disorders and the need for a comprehensive, coordinated response by countries' health and social services, the WHO adopted the "Comprehensive Mental Health Action Plan 2013-2020" (WHO, 2013). This global plan provided guidance for national action plans and highlighted strategies for mental health promotion and prevention. However, by 2022,

after the "Mental Health Atlas 2020" revealed insufficient progress in several countries, the WHO updated this plan as the "Comprehensive Mental Health Strategic Plan 2013-2030", approved during the 74th World Health Assembly (WHO, 2022c). This updated plan seeks to improve mental health through more effective governance, emphasizing mental health promotion, prevention for at-risk populations, and ensuring universal coverage for mental health services through community-based approaches. It also stresses the importance of strengthening mental health research.

In 2022, the WHO released the "World Mental Health Report: Transforming Mental Health for All", which asserts that improving a country's mental health would yield significant societal progress and calls on governments to accelerate its implementation (WHO, 2022e). The report identifies two key strategies for mental health reform: promoting mental health for all and protecting those at risk, especially children and adolescents. It emphasizes that mental health care should be provided within communities and integrated into general health services, ensuring that responsibility for mental health care extends beyond the health sector alone.

Chapter 6 of this report underscores the need for "multisectoral promotion and prevention for all", with particular attention given to early childhood, childhood, and adolescence as critical periods of vulnerability and opportunity in mental health (WHO, 2022e, p. 7). The report recognizes the profound impact that early caregiving and childhood experiences have on mental health across the lifespan: "Supportive caregiving and learning environments can be enormously protective of future mental health. Conversely, adverse childhood experiences increase the risk of mental disorders" (WHO, 2022e, p. 8). The strategies proposed to reduce risks and promote protective factors for child mental health policies feature supporting mental health, caregiver support, and the improvement of community and digital environments.

Although the WHO's mental health documents acknowledge the importance of promoting the mental health of caregivers and ensuring supportive childhood environments, they do not explicitly describe the need to protect perinatal mental health, which is often addressed under the broader scope of "youth health" (United Nations, 2022). Critics have pointed out that initiatives like the pan-European Mental Health Coalition, which aims to improve mental health across Europe through inclusive policies, prevention, and access to quality services, have only partially integrated perinatal mental health into these efforts (WHO, 2022b). The lack of a specific focus on perinatal mental health risks underestimating its importance, highlighting the need to address it as a distinct priority.

Conversely, in the WHO's documents and strategies related to maternal and child health, there is a long-standing focus on perinatal mental health, with considerable attention given to maternal well-being and child care. Based on a human rights framework, the WHO emphasizes the importance of centering women's preferences, values, and autonomy in the healthcare provided throughout their reproductive processes, encouraging active participation in improving care quality and promoting positive experiences. The WHO also supports integrating psychosocial care into health promotion activities during pregnancy, childbirth, and the postpartum period.

Women's rights in reproductive health, as well as the significance of their experiences with maternity care, are prominently reflected in the 2014 statement "Prevention and Elimination of Disrespect and Abuse during Facility-based Childbirth" (WHO, 2014c). This declaration calls attention to the global mistreatment of women during childbirth, which not only violates their right to respectful care but also threatens their rights to life, health, physical integrity and non-discrimination. It urges stronger "action, dialogue, research, and support to address this major public health and human rights issue" (WHO, 2014c, p. 1).

Between 2016 and 2022, the WHO updated its recommendations on pregnancy, childbirth, and postnatal care, presenting a trilogy of guidelines where women's experiences and their perceived quality of care play a central role. This is evident in the titles of the recommendations: "Antenatal Care for a Positive Pregnancy Experience", "Intrapartum Care for a Positive Childbirth Experience" and "Postnatal Care for the Mother and Newborn for a Positive Postnatal Experience" (WHO, 2016; WHO, 2018; WHO, 2022d).

In 2020, the WHO published its guidelines on "Improving Early Childhood Development", identifying maternal mental health as a foundational pillar for child development (WHO, 2020). The document highlights that achieving optimal child development requires affectionate caregiving, and often, caregivers need support to provide this. It also emphasizes the need to integrate specific psychological interventions for maternal mental health support into early childhood health and development services.

However, the first WHO document specifically dedicated to perinatal mental health was the "Guide for Integration of Perinatal Mental Health in Maternal and Child Health Services" (WHO, 2022a). This guide represents a major milestone, due to not only placing perinatal mental health at the forefront but also providing specific recommendations for integrating maternal mental health care into service provision and evaluating the impact of established programs. It outlines a comprehensive approach to perinatal mental health, ranging from promoting

mental health and preventing disorders to treating affected mothers, providing early mental health interventions within maternal and child services, and addressing vulnerable groups. The guide proposes a personalized and stepped-care intervention model, tailored to each woman and context of care.

In Annex III, the guide includes a list of quality indicators for assessing the proper implementation of mental health care within maternal and infant care services (WHO, 2022a). Key metrics to monitor these include mental health promotion, screening and detecting mental health issues, social support, psychological interventions, medication, health professional training, provider supervision, and service coordination. For each of these areas, it suggests various indicators, such as the number of perinatal mental health programs, the number of women served, their satisfaction levels, screening coverage, the number of women identified with perinatal mental health problems, medication prescriptions, the types of psychotropic drugs used, the number of psychological interventions provided, the number of professionals trained to perform first-level psychological interventions, among others (WHO, 2022a).

Implementation of Perinatal Mental Health Services: A Critical Discussion

As advocated by the WHO, perinatal mental health care includes its integration into pediatric and maternity services (WHO, 2022a). Developing maternal and child health services with comprehensive care requires significant structural changes. Some of these changes entail training and educating the professionals involved, allocating resources for service coordination, involving fathers and families in care, and taking the experiences into consideration as reported by the women using the services, among other issues (WHO, 2022a).

The challenges to integrating perinatal mental health into maternal and child healthcare are numerous. Some of the barriers to achieving adequate perinatal mental health care are the same as those that hinder the comprehensive care of mental health in healthcare systems. The WHO notes that, despite the increase in resources allocated to mental health in recent years, most health systems worldwide still fail to adequately invest in its care (WHO, 2018). Furthermore, individuals with mental health issues often suffer the unfavorable effects of other social determinants of health, such as poverty, violence, or unequal power relations, and often become stigmatized within healthcare systems (WHO, 2013). As a result, people with mental health issues often face greater difficulties in receiving adequate, quality, and non-discriminatory healthcare.

In the case of perinatal mental health care, additional gender-based discrimination against women and age-based discrimination in early childhood also come into play. The discrimination that many women still face in healthcare is evident in cases such as obstetric violence (WHO, 2014c; United Nations, 2019). Therefore, it is essential to train healthcare professionals in gender perspectives and fight against women's structural discrimination within healthcare systems (WHO, 2014c; López-Martín, 2021; United Nations, 2023). On the other hand, infants and young children, who have not yet developed a verbal language, are often not treated as full individuals, and healthcare efforts are not always made to ensure good communication with them (WHO, 2014a; WHO, 2014b; WHO, 2017).

The inequalities arising from different levels of economic development between countries cannot be ignored. According to WHO data, almost 800 women died each day in 2020 due to preventable causes related to pregnancy and childbirth, equivalent to nearly one maternal death every two minutes globally, and 95.0% of these deaths occurred in LMICs (WHO, 2023). Therefore, in many parts of the world, the primary investment in maternal and child health aims at training and educating maternity professionals (mainly midwives) to combat this scourge. In health systems where a large number of women are not even attended to during childbirth by specialized healthcare professionals, additional training in perinatal mental health competencies unfortunately poses a significant challenge. Nevertheless, the WHO has also been a key actor in efforts to integrate mental health care into maternal health services in LMICs. These initiatives have included task-shifting to non-medical professionals, such as nurses or social workers, and training community members to implement basic interventions aimed at improving maternal mental health (WHO, 2015).

It cannot be overlooked that improving the living conditions in which maternity and child-rearing take place means an essential part of protecting women's and early childhood mental health; this, however, goes beyond the competencies of health systems (WHO, 2022a). Indeed, social and economic policies are needed to adequately protect women from all discrimination based on maternity, ensuring paid maternity leave, decent working and housing conditions, and adequate public childcare systems, among other necessary measures.

Despite the challenges and difficulties, the WHO's efforts to improve perinatal mental health globally offer undeniable opportunities. In addition to improving access to mental health care for women who contact healthcare

systems for the first time for the care of their pregnancies and childbirths, the organization's comprehensive model can facilitate the therapeutic adherence of those reluctant to attend specific psychiatric services (WHO, 2022a). Furthermore, protecting and promoting perinatal mental health offers a privileged opportunity to improve population health, as the investment in this vital stage not only enhances the health of affected women and their babies but has been associated with long-term health improvements. Finally, and no less importantly, the early treatment of perinatal mental health disorders could reduce the significant economic costs associated with them in the short, medium, and long term (Bauer et al., 2014).

Conclusion

Paraphrasing the WHO's motto, "there is no health without mental health" (WHO, 2001b), we can also assert that there is no maternal and child health without perinatal mental health. Comprehensive care for mothers and their babies is a strategy that can improve population health by means of reducing the disease burden, while also contributing to the sustainability of healthcare systems by lowering associated economic costs.

The WHO's efforts to promote an integrated maternal and child healthcare model, which also includes perinatal mental health care, culminated in 2022 with publishing its first and only document dedicated specifically to perinatal mental health. This document represents a critical step toward achieving comprehensive, quality healthcare for mothers and their babies worldwide.

However, there are barriers that hinder the development of this model within healthcare systems, such as the discrimination faced by women and young children, the persistent stigma surrounding individuals with mental health issues, and the severe shortcomings in maternal and child healthcare that many healthcare systems, particularly in LMICs, still exhibit.

Although the prospect of adequate global perinatal mental health services remains distant, the current awareness of its importance is encouraging. To advance in this direction, it is essential for governments, international organizations, and stakeholders to work together to implement the WHO's recommendations, promoting policies and programs that integrate perinatal mental health into all levels of care.

Furthermore, it is crucial to strengthen the training of healthcare professionals in this field, ensure sufficient resources, and promote ongoing research on best practices in perinatal mental health care, incorporating the experiences of mothers, fathers, and families into healthcare services.

Only through a sustained and collective effort can a true transformation in maternal and child mental health care be achieved, ensuring that all mothers and babies receive the support and care they need to reach their full health and well-being potential.

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Author contribution

Rocío PARICIO-DEL-CASTILLO: conceptualization, design, methodology, investigation, funding acquisition, investigation, project administration, data management, formal analyses, interpretation, supervision, writing original draft, writing review and editing.

Declaration of interest statement

The author has no conflicts of interest to disclose.

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References

Bauer, A., Parsonage, M., Knapp, M., Iemmi, V., & Adelaja, B. (2014). *The costs of perinatal mental health problems*. Centre for Mental Health and London School of Economics. http://dx.doi.org/10.13140/2.1.4731.6169

Conecta Perinatal. (2022). Mejorar el cuidado de la salud mental perinatal. Fundamentos, propuestas y peticiones [Improving Perinatal Mental Health Care: Fundamentals, Proposals, and Requests]. *Naciendo, 2*, 103–153. https://doi.org/10.52961/02.trzx3056

López-Martín, A. G. (Principal Investigator). (2021-2026). *CEDAW 40 years later: Are women's rights liquid?* (Reference: PID2021-122788OB-I00). Ministry of Science and Innovation, National R&D&I Program.

National Institute for Health and Care Excellence. (2007). Antenatal and postnatal mental health: Clinical management and service guidance (Clinical guideline CG45). NICE. https://www.nice.org.uk/guidance/cg45

Paricio Del Castillo, R. (2024). Salud materno-infantil y salud mental perinatal: un ámbito de mejora en la sanidad española [Maternal and Child Health and Perinatal Mental Health: an area of improvement in Spanish Healthcare]. *Revista Española de Salud Pública, 98*, e202404031. https://pubmed.ncbi.nlm.nih.gov/38639202

Powell, C., Bedi, S., Nath, S., Potts, L., Trevillion, K., & Howard, L. (2022). Mothers' experiences of acute perinatal mental health services in England and Wales: A qualitative analysis. *Journal of Reproductive and Infant Psychology, 40*(2), 155–167. https://doi.org/10.1080/02646838.2020.1814225

Roque, A. T. F., Lasiuk, G. C., Radünz, V., & Hegadoren, K. (2017). Scoping review of the mental health of parents of infants in the NICU. *Journal of Obstetric, Gynecologic, and Neonatal Nursing, 46*(4), 576–587. https://doi.org/10.1016/j.jogn.2017.02.005

Tripathy, P. (2020). A public health approach to perinatal mental health: Improving health and wellbeing of mothers and babies. *Journal of Gynecology Obstetrics and Human Reproduction, 49*(6), Article 101747. https://doi.org/10.1016/j.jogoh.2020.101747

United Nations. (2003). *Committee on the Rights of the Child. General Comment No. 4: Adolescent health and development in the context of the Convention on the Rights of the Child (CRC/GC/2003/4)*. https://digitallibrary.un.org/record/503074?v=pdf

United Nations. (2019). *Report of the Special Rapporteur on violence against women, its causes and consequences: A human rights-based approach to mistreatment and violence against women in reproductive health services, with a focus on childbirth and obstetric violence*. https://documents-dds-ny.un.org/doc/UNDOC/GEN/N19/213/30/PDF/N1921330.pdf?OpenElement

United Nations. (2022). *Youth Mental Health.* https://sdgs.un.org/partnerships/youth-mental-health

United Nations. (2023). *Committee on the Elimination of Discrimination against Women (CEDAW), Views adopted by the Committee under article 7(3) of the Optional Protocol concerning Communication No. 154/2020. CEDAW Committee Views No. 154/2020, of 24 February 2023 (CEDAW/C/84/D/154/2020)*. https://digitallibrary.un.org/record/4008329?ln=es&v=pdf

World Health Organization. (2001a). *Mental Health Atlas*. https://www.who.int/teams/mental-health-and-substance-use/data-research/mental-health-atlas

World Health Organization. (2001b). *The world health report 2001: Mental health: New understanding, new hope*. https://iris.who.int/handle/10665/42390

World Health Organization. (2002). *Global mental health action plan: 55th World Health Assembly*. https://iris.who.int/bitstream/handle/10665/259364/WHA55-2002-REC1-eng.pdf

World Health Organization. (2006). *WHO Resource book on mental health, human rights, and legislation*. http://www.lhac.eu/resources/library/who_resource-book-on-mental-health-human-rights-and-legislation--2.pdf

World Health Organization. (2008a). *Maternal mental health and child health and development in low and middle income countries: Report of the meeting held in Geneva, Switzerland, 30 January – 1 February 2008*. https://www.who.int/publications/i/item/9789241597142

World Health Organization. (2008b). *Mental health gap action programme (mhGAP)*. https://www.who.int/publications/i/item/9789241596206

World Health Organization. (2013). *Comprehensive mental health action plan 2013-2020*. https://www.who.int/publications/i/item/9789240031029

World Health Organization. (2014a). *Every newborn: An action plan to end preventable deaths*. https://www.who.int/publications/i/item/every-newborn-an-action-plan-to-end-preventable-deaths

World Health Organization. (2014b). *Integrated management of childhood illness*. https://www.who.int/publications/m/item/integrated-management-of-childhood-illness---chart-booklet-(march-2014)

World Health Organization. (2014c). *The prevention and elimination of disrespect and abuse during facility-based childbirth*. https://www.who.int/publications/i/item/WHO-RHR-14.23

World Health Organization. (2015). Thinking Healthy: A Manual for Psychosocial Management of Perinatal Depression. https://www.who.int/publications/i/item/WHO-MSD-MER-15.1" \t "_blank

World Health Organization. (2016). *WHO recommendations on antenatal care for a positive pregnancy experience*. https://iris.who.int/bitstream/handle/10665/250796/9789241549912-eng.pdf

World Health Organization. (2017). *WHO recommendations on newborn health: Guidelines for care of the healthy newborn*. https://www.who.int/publications/i/item/WHO-MCA-17.07

World Health Organization. (2018). [Recomendaciones de la OMS sobre cuidados maternos y neonatales para una experiencia posnatal positiva] *WHO recommendations: Intrapartum care for a positive childbirth experience*. https://iris.paho.org/bitstream/handle/10665.2/57092/9789275326817_spa.pdf?sequence=1&isAllowed=y

World Health Organization. (2019). *The WHO Special initiative for mental health (2019-2023): Universal health coverage for mental health*. https://www.who.int/publications/i/item/special-initi-

ative-for-mental-health-(2019-2023)#:~:text=This%20WHO%20Special%20Initiative%20seeks,to%20100%20million%20more%20people .

World Health Organization. (2020). *Improving early childhood development.* https://www.who.int/publications/i/item/97892400020986

World Health Organization. (2021b). *Mental Health ATLAS 2020*. https://www.who.int/publications/i/item/9789240036703

World Health Organization. (2022a). *WHO guide for the integration of perinatal mental health into maternal and child health services*. 19 September 2022. https://www.who.int/publications/i/item/9789240057142

World Health Organization. (2022b). First meeting of the pan-European Mental Health Coalition: From debate to action. https://www.who.int/europe/publications/i/item/WHO-EURO-2022-5769-45534-65202

World Health Organization. (2022c). *Mental health action plan 2013-2030*. https://www.emro.who.int/mnh/mental-health-action-plan/index.html

World Health Organization. (2022d). *WHO recommendations on maternal and newborn care for a positive postnatal experience*. https://www.who.int/publications/i/item/9789240045989

World Health Organization. (2022e). *World mental health report: Transforming mental health for all*. https://www.who.int/publications/i/item/9789240049338

World Health Organization. (2022f). Mental health (Fact sheet). https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response

World Health Organization. (2023). *Trends in maternal mortality 2000 to 2020: Estimates by WHO, UNICEF, UNFPA, World Bank Group, and the United Nations Population Division.* https://www.who.int/publications/i/item/9789240068759

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RESEARCH ARTICLE

Early Maladaptive Schemas' Associations with Big-Five Personality Traits in Two Non-Clinical Adult Samples from Different Cultural Backgrounds

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Introduction: While personality traits and early maladaptive schemas (EMSs) can affect an individual's behavior and well-being, the links between these constructs are under-researched, especially in non-clinical samples.
Aims: Two studies were conducted to address these links, intending to explore their specifics, as previous research evidenced various associations' models.
Methods: In Study 1, the sample consisted of 120 respondents (65.0% females) living in the UK and the USA. In Study 2, the sample consisted of 244 respondents (68.0% females) living in Lithuania. In both studies, most of the respondents were aged 18-25. The survey was administered online. Studies 1 and 2 applied the Big Five Inventory and Young Schema Questionnaire.
Results: In Study 1, neuroticism was significantly positively associated with 17 EMSs. Extraversion stood significantly negatively related to 12 EMSs, conscientiousness was significantly negatively related to 15 EMSs, open-mindedness stood significantly negatively related to 2 EMSs, but significantly positively related to admiration, and agreeableness appeared significantly negatively related to 9 EMSs.
In Study 2, neuroticism was significantly positively associated with 16 EMSs. Extraversion stood significantly negatively related to 9 EMSs, conscientiousness was significantly negatively related to 12 EMSs, open-mindedness and agreeableness were significantly negatively related to 10 EMSs.
Conclusions: Study 2 partly failed to replicate the results of Study 1, which implies that the model of links between EMSs and personality traits could be impacted by cultural factors, and needs further investigation.

Keywords: personality traits, Big Five, early maladaptive schemas, non-clinical samples, well-being

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Introduction

Early maladaptive schemas (EMSs) are dysfunctional core beliefs about self, others, and the world, primarily developed during childhood due to an adverse environment and unmet needs (Young, 1999). EMSs, as negative patterns of thoughts, arise in the early years because of negative valence experiences/interactions, mainly with caregivers (Young, 2014). EMSs gradually evolve as "conceptual templates" that shape how individuals perceive themselves and the world around them and might profoundly affect feelings and behaviors, supposedly, significantly impacting mental health and psychological well-being (Young, Klosko, & Weishaar, 2003).

Personality traits are relatively stable patterns of thoughts, feelings, and behaviors commonly used to describe and understand individuals (Soto & John, 2017b). In the "Big Five" model, personality traits are organized into five broad dimensions: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience (McCrea & Costa, 1987). EMSs are not typically used to describe or understand personality traits but can presumably interact with them and affect them.

Previous research demonstrated that personality and EMSs are related and can interact with each other in complex ways (Bilge & Balaban, 2021; Etemadnia et al., 2021; Güler & Özgörüş, 2022; Pauwels et al., 2016; Shojaati, Kalantari, & Mulavi, 2019; Shorey, Stuart, & Anderson, 2014; Stavropoulos et al., 2020; Thimm, 2011; Yığman et al., 2021). However, the relationship between these constructs still remains an area of ongoing research. Some studies explored links between EMSs and personality traits in clinical and non-clinical samples. The findings revealed that while the links between EMSs and personality traits are more or less evident in clinical samples (Bilge & Balaban, 2021; Esmaeilian et al., 2019; Güler & Özgörüş, 2022; Pauwels et al., 2016; Shojaati, Kalantari, & Mulavi, 2019; Shorey, Stuart, & Anderson, 2014; Yığman et al., 2021), the associations between EMSs and personality traits in healthy individuals need deeper investigation. This research aimed to explore the links between EMSs and personality traits in healthy individuals (without a clinical diagnosis of mental illness).

Early Maladaptive Schemas

EMSs are systems of thoughts that develop in childhood and persist into adulthood, possibly leading to emotional and relationship difficulties (Young, 1999). EMSs are defined as 'self-defeating emotional and cognitive patterns that begin early in our development and repeat throughout life' (Young, Klosko, & Weishaar, 2003, p. 7). Young (2014) described 18 EMSs which are presented in Table 1.

Unaddressed EMSs, activated in adulthood, can lead to a wide range of mental health problems, such as anxiety, depression, or personality disorders (Bilge & Balaban, 2021; Güler & Özgörüş, 2022; Jain & Singh, 2022; Shorey, Stuart, & Anderson, 2014; Stavropoulos et al., 2020). However, EMSs can be addressed through psychotherapy; e.g., cognitive-behavioral therapy (CBT), including schema therapy, which might help individuals identify and challenge their negative schemas and develop more adaptive ways of thinking, feeling, and behaving (Young, 2014).

Previous research linked EMSs to various personality disorders (Koppers et al., 2021; Bilge & Balaban, 2021), but the links between EMSs and personality traits were under-researched, even though their analysis can provide crucial information on the specifics of maladaptive cognitions related to each personality trait.

Personality Traits

The Big Five Personality Theory, initiated by Goldberg (1990) in the 1990s and later developed by McCrea and Costa (McCrea & Costa,1987; Costa & McCrae, 1990), is a widely researched and accepted theory of personality, which describes five broad dimensions of personality, each represented by a set of qualities, that can be used to describe an individual's personality: 1) openness, which encompasses qualities such as imagination, creativity, and a willingness to experience new things; 2) conscientiousness, which encompasses attributes such as responsibility, organization, and dependability; 3) extraversion, which encompasses characteristics such as outgoingness, sociability, and assertiveness; 4) agreeableness, which encompasses qualities such as kindness, cooperativeness, and empathy; 5) neuroticism, which encompasses characteristics such as anxiety, moodiness, and emotional instability. These traits, which can be measured through self-report questionnaires, are considered relatively stable throughout an individual's life, and are believed to be impacted by both "nature" and "nurture" (McCrea & Costa, 1987).

In previous studies, openness to experience has been proven to be related to intelligence, as individuals who scored high on crystallized intelligence were also more open to experiences (Schretlen et al., 2010). Conscientiousness was linked to a strong sense of responsibility and good timekeeping skills (Stieger et al., 2020). Extraversion

Table 1. Early maladaptive schemas and their explanations

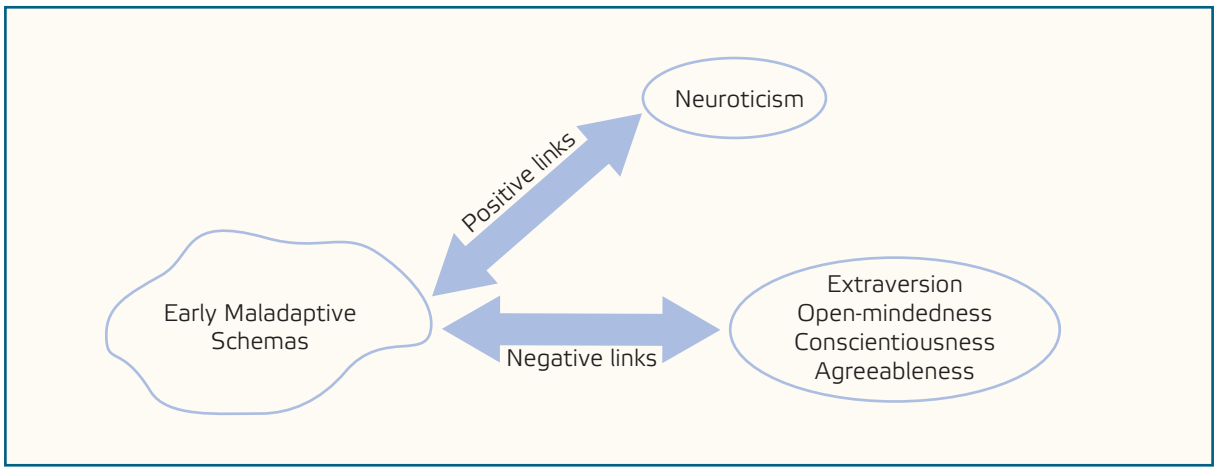
Early maladaptive schema	Explanation
Abandonment/Instability	The belief that others will leave/abandon them, linked to the fear of abandonment or losing someone important based on past experiences of loss or instability in relationships.
Mistrust/Abuse	The belief that others will harm, exploit, or deceive the individual based on past experiences of betrayal or abuse.
Emotional Deprivation	The belief that others will not meet one's needs for emotional support based on past experiences of neglect or emotional unavailability.
Defectiveness/Shame	The belief that one is inherently flawed, fundamentally defective, or inadequate, causing intense shame and low self-esteem.
Social Isolation/Alienation	The belief that one is fundamentally different from others and does not fit in, causing feelings of loneliness and disconnection.
Dependence/Incompetence	The belief that one cannot function effectively on one's own, cannot handle responsibilities, and necessitates others to take care of them or make decisions for them, leading to excessive reliance on others.
Vulnerability to Harm or Illness	The belief in being physically or emotionally harmed or becoming ill, linked to excessive fear of physical or psychological harm or illness.
Enmeshment/Undeveloped Self	Fusion of one's identity with others, excessive emotional closeness with others, neglecting one's own needs and goals, leading to loss of individuality.
Failure	The belief that one will fail, be unable to meet expectations, or will not succeed at essential tasks, causing feelings of inadequacy.
Subjugation	The belief that one must subjugate one's own needs to meet the demands of others, surrendering one's own needs and desires to the needs and desires of others, leading to feelings of powerlessness.
Self-Sacrifice	The belief that one must sacrifice one's own needs to meet the needs of others, excessive focus on the needs of others at the expense of one's own needs and desires.
Approval/Recognition Seeking	Excessive need for approval or recognition from others, leading to feelings of inadequacy or low self-esteem
Negativity/Pessimism	Pervasive negative attitudes and expectations about life and the future, causing feelings of hopelessness or despair.
Emotional Inhibition	Suppression of spontaneous emotion or expression of emotion, difficulty expressing emotions, leading to a sense of disconnection from others and oneself.
Unrelenting Standards/ Hyper-criticalness	The belief that one must strive for perfection and be overly critical of oneself and others, excessively high and rigid personal standards, causing feelings of inadequacy and self-criticism.
Punitiveness	The belief that people should be harshly punished for mistakes, assumption that others (including oneself) deserve to be punished, leading to feelings of anger and resentment.
Entitlement/Grandiosity	The belief that one is superior to others and entitled to special privileges and exempt from rules, leading to a sense of entitlement and arrogance.
Insufficient Self-Control/Self-Discipline	Difficulty in controlling/regulating impulses, behaviors, and emotions, leading to problems with addiction, impulsivity, or self-destructive behavior.

was linked to seeking attention from others (Wilt & Revelle, 2009) and getting support from others (Barańczuk, 2019). Agreeableness was linked to the ability to work in teams (Graziano et al., 2007). Neuroticism was linked to higher levels of worry, limited ability to cope with daily stressors, and less happiness in couple relationships (Headey, Muffels, & Wagner, 2010).

It is not easy to verify whether EMSs predict personality traits or if personality traits can contribute to the activation of EMSs. Young, Klosko, and Weishaar (2003) have mentioned that even though schemas develop in early life, the child's actual temperament (which, according to Caspi, Robert, & Shiner, 2005, reflects personality) can play a significant role in the development of schemas.

Previous studies demonstrated some links between EMSs and personality traits across different samples. A study by Muris (2006) on adolescents (around 13 years old) explored the relationship between EMSs and personality traits: neuroticism was related to all the EMSs, and the unrelenting standards schema was associated with extraversion, openness to experience, and conscientiousness. The schema of self-sacrifice stood positively related to agreeableness, and the schema of vulnerability to harm was also positively associated with openness (Muris, 2006). A study by Thimm (2010) on an adult outpatient sample yielded similar results of neuroticism associated with most EMSs and found that self-sacrifice stood positively associated with agreeableness. The same study also demonstrated that disagreeableness was associated with mistrust and insufficient self-control schemas (Thimm,

Figure 1. Conceptual model of the links between EMSs and personality traits



2010). EMSs were also linked to low agreeableness and high neuroticism (Sava, 2009). Even though ample research into EMSs and personality traits exists, the findings still remain inconsistent, and there is a lack of studies in non-clinical samples.

Current Research

The current research addresses intercorrelation between the EMSs and personality traits.

Based on previous studies and the conceptual theory of EMSs, it could be assumed that early maladaptive schemas can be related to the five personality traits (Shojaati, Kalantari, & Mulavi, 2019).

We conducted two cross-sectional studies in non-clinical samples to analyze the links between EMSs and personality traits to replicate the results of Study 1 in Study 2. Studies 1 and 2 focused on the cross-correlational links between EMSs and five personality traits, and, specifically, on the links between EMSs and neuroticism. In Studies 1 and 2, we hypothesized associations between EMSs and personality traits (Figure 1), still assuming no significant differences in EMSs and personality traits in Study 1 and Study 2 (H1).

In Studies 1 and 2, we explicitly presumed positive links between EMSs and neuroticism (H2), and negative links between EMSs and extraversion, open-mindedness, conscientiousness, and agreeableness (H3).

Methods

Participants

In Study 1, the respondents were 120 individuals (without a clinical diagnosis at the time of the survey) living in English-speaking countries, including the UK and the USA. Of those, 78 were females (65.0%).

In Study 2, the respondents consisted of 244 individuals (without a clinical diagnosis at the time of the survey) living in Lithuania. Of those, 166 participants were females (68.0%).

Sociodemographic characteristics of participants at baseline in Studies 1 and 2 are presented in Table 2.

Measures

Big Five Inventory - Personality traits

In Study 1, we applied the Big Five Inventory – 2 Short Form (BFI-2SF; Soto & John, 2017b). In Study 2, we applied the Big Five Inventory – 2 (BFI-2; Soto & John, 2017a). Big Five Inventory – 2 is a 60-item instrument, and Big Five Inventory – 2 Short Form is a 30-item instrument that asks respondents if they agree with the descriptions provided: 'I am someone who'… Examples of the items are: 'Is dominant, acts as a leader' for extraversion, 'Is compassionate, has a soft heart' for agreeableness, 'Is reliable, can always be counted on' for conscientiousness,

Table 2. Sociodemographic Characteristics of Participants at Baseline in Studies 1 and 2

Baseline characteristic	Study 1 (*N* = 120)		Study 2 (*N* = 244)	
	n	%	*n*	%
Gender				
Female	78	65.0	166	68.0
Male	40	33.4	66	27.0
Non-binary	1	0.8		
Prefer not to answer	1	0.8	12	5.0
Age				
18-25 years old	45	37.6	196	80.4
26-35 years old	30	25.0	29	11.8
36-45 years old	18	15.0	15	6.2
46-55 years old	20	16.6	3	1.2
56+ years old	7	5.8	1	0.4
Education				
Bachelor's degree	47	39.2	49	20.2
Doctorate degree	1	0.8	2	0.8
Health and Social Care Levels 1 and 2	1	0.8		
High/Secondary school graduate	29	24.3	167	68.4
Master's degree	10	8.3	11	4.5
No schooling completed	13	10.8	2	0.8
Trade/technical/vocational training	19	15.8	13	5.3
Student status				
Student at the moment	35	29.2	197	80.7
Not studying at the moment	85	70.8	47	19.3
Employment				
Employed (Full-time/Part-time)	52	43.3	92	37.7
Not employed	68	56.7	152	62.3

'Worries a lot' for neuroticism, and 'Is fascinated by art, music, or literature' for open-mindedness. The response pattern follows a Likert form with a scale ranging from 1 (disagree strongly) to 5 (agree strongly). In a study by Soto and John (2017a), the Cronbach's α for the BFI-2SF subscales ranged from .73 to .83. If Cronbach's α values were less than .5, it would be indicative of poor reliability and the need to redesign the scales. In Study 1, the Cronbach's α of the BFI-2SF subscales ranged from .51 to .61, and indicated moderate reliability, while in Study 2, the Cronbach's α of the BFI-2F subscales ranged from .68 to .89.

Young Schema Questionnaire – Short Form – 3rd Version - Early maladaptive schemas

Young Schema Questionnaire – Short Form – 3rd Version (YSQ-SF3; Young & Brown, 2005) was used to assess the early maladaptive schemas. The permission to use the instrument for research was acquired by purchasing the Schema eBook through the original website. This 90-item self-report instrument measures 18 EMSs. Each item presented is rated on a Likert scale from 1 (completely untrue of me) to 6 (describes me perfectly). Examples of the items are: 'I feel that people will take advantage of me' (Mistrust), 'I think that if I do what I want, I am only asking for trouble' (Subjugation). The participants were instructed to rate each statement based on the options that best describe them over the last year or base the answer on their feelings instead of what they think is true. In previous studies, the convergent and congruent validity of the YSQ-SF3 was found at a satisfactory level, and Cronbach's α for the subscales ranged from .63 to .85, suggesting good reliability (Phillips et al., 2017). In Study

Table 3. Cronbach's α and McDonald's ω Values Showing the Internal Consistency regarding the Scales used in Studies 1 and 2

	Variables	Cronbach's α		McDonald's ω	
		Study 1	Study 2	Study 1	Study 2
Personality Traits	Extraversion	.51	.82	.51	.84
	Agreeableness	.52	.78	.52	.78
	Conscientiousness	.52	.84	.52	.84
	Neuroticism	.55	.89	.56	.91
	Open-mindedness	.61	.68	.61	.71
Early Maladaptive Schemas	Abandonment	.79	.81	.79	.82
	Mistrust	.76	.84	.76	.84
	Emotional deprivation	.68	.74	.69	.74
	Defectiveness/ Unlovability	.77	.75	.77	.76
	Social Isolation / Alienation	.65	.83	.66	.84
	Practical Incompetence / Dependence	.72	.74	.72	.74
	Vulnerability to Harm or Illness	.69	.68	.70	.70
	Enmeshment	.75	.8	.75	.8
	Failure to Achieve	.73	.83	.74	.84
	Entitlement / Superiority	.52	.63	.54	.67
	Insufficient Self Control / Self Discipline	.71	.76	.71	.76
	Subjugation	.71	.8	.71	.81
	Self-sacrifice	.77	.63	.77	.67
	Admiration / Recognition Seeking	.73	.69	.73	.70
	Pessimism / Worry	.75	.76	.76	.77
	Emotional Inhibition	.64	.84	.64	.85
	Unrelenting Standards	.63	.74	.63	.74
	Self-Punitiveness	.69	.67	.70	.68

1, the Cronbach's α of EMSs subscales ranged from .52 to .77, while in Study 2, the Cronbach's α of EMSs subscales ranged from .63 to .84.

Table 3 presents Cronbach's α and McDonald's ω values that show the internal consistency regarding the scales used in Studies 1 and 2.

Procedure

The survey was administered online, the data for Study 1 being collected from October 2022 to December 2022 through social media networks, and the data for Study 2collected from September 2021 to March 2023 on the website www.psytest.online. It was part of a larger project on links between various psychological variables, including mental health and psychological well-being. The participants of both studies were informed about the study's purpose, the researchers' contacts, and the possibility of discontinuing participation at any time while filling in the questionnaire. The questionnaires took approximately 20-30 minutes to complete.

All respondents provided an informed consent to participate in the study. The procedure followed the guidelines in the Declaration of Helsinki; Study 1 was approved by the Institutional Review Board of the Institute of Management and Psychology (No. VIPI-INT-2022-02), and Study 2 was approved by the Institute of Management and Psychology, based on the approval of the Biomedical Research Ethics Committee at KU (No. STIMC-BMTEKP03).

Statistical Analyses

To test the validity of the instruments, we applied the confirmatory factor analysis (CFA) using JASP (0.16.04.0) software. For the rest of the statistical procedures, we applied SPSS (version 29.0) software.

First, we assessed the scales' reliability (Cronbach's α and McDonald's ω). Next, the normality of data distribution was evaluated (Shapiro Wilk test, skewness, and kurtosis). We then performed Pearson correlation and multiple linear regression (enter method) analyses to examine the associations between personality traits and EMSs.

Results

The results of CFA showed a weak validity of the instruments, as the values of CFI, TLI and NFI were < .9, some of the values of RMSEA were > .08, and values of SRMR were > .05; these results may indicate the limitations due to the samples' sizes.

In Study 1 and Study 2, although the Shapiro-Wilk test was mainly significant, the skewness and kurtosis (Table 4) suggested that the data may be considered normally distributed as most of the data falls within the range of +/-2

Table 4. Descriptive statistics, skewness, kurtosis, and the results of comparing samples in Studies 1 and 2

	Study 1 (*N* = 120)				Study 2 (*N* = 244)						
Variables	*M*	*SD*	S	K	*M*	*SD*	S	K	*t*(353)	*p*	Cohen's d
Early Maladaptive Schemas											
Emotional Deprivation	2.58	0.92	.25	-.21	2.67	1.05	.20	-.65	-0.887	.376	-0.10
Abandonment	2.62	0.99	.66	.61	2.57	1.13	.58	-.32	0.870	.385	0.10
Mistrust	2.66	0.99	.71	.61	2.33	1.12	.81	-.03	2.942	.003	0.33
Isolation/alienation	2.69	0.84	.38	.54	2.52	1.10	.80	.14	1.900	.058	0.21
Defectiveness/unlovability	2.69	0.84	.38	.54	2.47	1.05	.61	-.06	1.871	.062	0.21
Failure to achieve	2.64	0.94	.53	.74	2.35	1.16	.79	-.24	2.614	.009	0.29
Practical incompetence	2.52	0.92	.72	1.42	2.51	1.02	.52	.11	0.023	.982	0.003
Vulnerability to Harm	2.52	0.90	.35	-.27	2.64	0.96	.31	-.02	-1.165	.245	-0.13
Enmeshment	2.45	0.94	.68	.44	2.40	1.13	.86	.15	0.349	.727	0.04
Subjugation	2.60	0.88	.46	-.08	2.54	1.11	.79	.11	0.550	.582	0.06
Self-sacrifice	2.90	1.00	.73	.43	2.72	0.92	.51	-.06	1.941	.053	0.22
Emotional inhibition	2.71	0.88	.51	.13	2.37	1.13	.67	-.28	3.058	.002	0.34
Unrelenting Standards	3.00	0.91	.56	.28	2.76	1.06	.37	-.31	2.338	.020	0.26
Entitlement/superiority	2.66	0.76	.42	.17	3.02	0.97	.15	-.13	-3.559	< .001	-0.40
Insufficient self-control	2.83	0.96	.64	.42	2.69	1.01	.46	-.14	1.498	.135	0.17
Admiration	2.76	0.94	.79	.94	2.91	.97	.24	-.26	-1.371	.171	-0.15
Pessimism	2.71	0.94	.71	.97	2.58	1.07	.55	-.42	1.270	.205	0.14
Self-punitiveness	2.65	0.91	.57	.76	2.63	0.91	.69	.95	0.523	.601	0.06
Personality Traits											
Extraversion	2.97	0.69	-.14	.44	3.27	0.59	-0.07	-0.25	-6.325	< .001	-0.71
Agreeableness	3.26	0.70	.26	-.12	3.54	0.52	-0.31	0.26	-5.051	< .001	-0.57
Conscientiousness	3.19	0.72	.29	.31	3.41	0.59	-0.21	-0.10	-2.751	.006	-0.31
Neuroticism	2.98	0.72	-.32	.19	2.99	0.76	0.09	-0.43	-1.784	.075	-0.20
Open-mindedness	3.18	0.77	-.10	.07	3.61	0.47	-0.32	0.02	-9.154	< .001	-1.03

Note: *M* = Mean; *SD* = standard deviation; S = skewness; K = kurtosis.

(George & Mallery, 2010), so the parametric statistics could be applied. The means, standard deviations, skewness, kurtosis of the variables, and results of the Independent samples' t-test in Study 1 (English-speaking countries sample) and Study 2 (Lithuanian sample) are presented in Table 4.

In both samples, the data on EMSs were positively skewed, while most of the data on personality traits were negatively skewed. No transformations for further analyses were applied due to moderated skewness and kurtosis.

Although both samples were non-clinical, the mean scores showed that groups were to some extent not homogenous in EMSs and personality traits, possibly due to cultural factors or the characteristics of the samples. However, Independent samples' T-test partially confirmed H1, which assumed no significant differences in the samples' EMSs and personality traits. The means involving schemas of mistrust, failure to achieve, emotional inhibition, unrelenting standards stood higher in Study 1, while the mean of entitlement / superiority stood higher in Study 2, but no significant differences exhibited in other EMSs. There were also no significant differences in the means of neuroticism in Studies 1 and 2, although the other personality traits' scores were significantly different.

Furthermore, we applied the models of associations separately for Study 1 and Study 2. Although differences in the samples were found, we still expected to identify similar patterns of links between EMSs and personality traits.

Study 1

The correlation analysis in Study 1 (Table 5) partially confirmed H2 and H3, which assumed links between EMSs and personality traits. The results revealed that extraversion was significantly negatively related to almost all

Table 5. Intercorrelations for study variables in Study 1

Variables	Extraversion		Agreeableness		Conscientiousness		Neuroticism		Open-mindedness	
	r	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*
Abandonment	-.38	.000	-.17	.062	-.17	.062	.48	.000	-.15	.094
Mistrust	-.19	.040	-.19	.030	-.26	.018	.39	.000	-.05	.577
Emotional Deprivation	-.14	.120	-.28	.002	-.25	.006	.25	.005	-.11	.217
Defectiveness / Unlovability	-.32	.000	-.19	.029	-.34	.000	.44	.000	-.08	.370
Failure to Achieve	-.32	.000	-.28	.002	-.22	.014	.35	.000	-.10	.273
Isolation / Alienation	-.32	.000	-.19	.029	-.34	.000	.44	.000	-.08	.370
Practical Incompetence / Dependence	-.35	.000	-.31	.000	-.29	.001	.38	.000	-.12	.195
Vulnerability to Harm	-.16	.091	-.37	.000	-.27	.003	.31	.001	-.22	.016
Enmeshment	-.08	.401	-.14	.136	-.24	.009	.24	.009	-.38	.000
Subjugation	-.24	.008	-.13	.152	-.26	.003	.42	.000	-.11	.222
Self-Sacrifice	-.02	.984	.08	.391	.012	.898	.23	.013	.02	.874
Emotional Inhibition	-.27	.003	-.08	.374	-.18	.047	.28	.002	-.08	.389
Unrelenting Standards	-.21	.023	.07	.435	.04	.686	.36	.000	.14	.119
Entitlement / Superiority	.03	.978	-.12	.209	-.22	.016	.15	.092	-.13	.164
Insufficient Self-Control	-.33	.000	-.05	.614	-.42	.000	.34	.000	.05	.629
Admiration	-.15	.115	-.07	.450	-.24	.008	.35	.000	.20	.025
Pessimism	-.29	.002	-.28	.002	-.20	.026	.45	.000	-.10	.274
Self-Punitiveness	-.24	.008	-.29	.001	-.18	.046	.35	.000	.03	.741

Table 6. Regressions of Associations between Neuroticism and Early Maladaptive Schemas in Study 1

Variables	*B*	*SE*	*β*	*t*	*p*	95.0% CI
(Constant)	1.99	.24		8.26	.000	[1.51, 2.47]
Emotional Deprivation	0.08	.09	.12	0.94	.348	[-0.09, 0.25]
Abandonment	0.18	.09	.27	2.00	.048	[0.00, 0.35]
Mistrust	0.07	.09	.11	0.76	.446	[-0.11, 0.24]
Defectiveness / Unlovability	0.08	0.11	.10	0.73	.466	[-0.14, 0.30]
Failure to Achieve	0.06	0.09	.09	0.66	.511	[-0.13, 0.25]
Practical Incompetence / Dependence	0.04	0.09	.05	0.38	.700	[-0.16, 0.23]
Vulnerability to Harm	-0.11	0.09	-.15	-1.24	.217	[-0.21, 0.06]
Enmeshment	0.03	0.08	.04	0.33	.744	[-0.14, 0.19]
Subjugation	0.12	0.11	.16	1.17	.243	[-0.08, 0.33]
Self-Sacrifice	-0.14	0.08	-.22	-1.75	.083	[-0.31, 0.02]
Emotional Inhibition	-0.09	0.09	-.12	-0.92	.356	[-0.28, 0.10]
Unrelenting Standards	0.11	0.08	.15	1.27	.204	[-0.06, 0.28]
Entitlement / Superiority	-0.18	0.09	-.21	-1.89	.061	[-0.37, 0.01]
Insufficient Self-Control	-0.03	0.08	-.04	-0.35	.722	[-0.19, 0.14]
Admiration	0.06	0.08	.08	0.73	.466	[-0.10, 0.22]
Pessimism	0.12	0.09	.17	1.22	.222	[-0.07, 0.31]
Self-Punitiveness	-0.02	0.09	-.02	-0.17	.866	[-0.19, 0.16]

Note. Dependent Variable: Neuroticism.

EMSs. Similarly, conscientiousness was significantly negatively related to almost all EMSs, except for abandonment, self-sacrifice, and unrelenting standards. Open-mindedness was significantly negatively related to vulnerability to harm and enmeshment, but, unexpectedly, significantly positively related to admiration, and no other significant correlations were observed. Agreeableness was significantly negatively related to mistrust, emotional deprivation, defectiveness/unlovability, failure to achieve, isolation/alienation, practical incompetence/dependence, vulnerability to harm, pessimism/worry, and self-punitiveness, but no other significant correlations were found. Finally, as expected, neuroticism was significantly positively associated with most maladaptive schemas - 17 EMSs, except for entitlement/superiority.

Furthermore, a multiple linear regression analysis was performed (enter method) to explore the specifics of associations between neuroticism and early maladaptive schemas (H2). Neuroticism represented the dependent variable, while the predictors were the eighteen EMSs, as some previous research indicated that early maladaptive schemas start forming in the earliest stages of infancy and might contribute to the development of personality traits, especially neuroticism (Bahramizadeh & Ehsan, 2011). Table 6 displays the results.

We found a significant regression equation ($F(17, 102) = 3.24$, $p < .001$, $R^2 = 0.35$). A schema of abandonment contributed significantly to the model, indicating significant positive associations between abandonment and neuroticism in Study 1.

Table 7. Intercorrelations for Study variables in Study 2

Variables	Extraversion		Agreeableness		Conscientiousness		Neuroticism		Open-mindedness	
	r	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*
Abandonment	-.11	.080	-.09	.132	-.12	.061	.27	.000	-.16	.013
Mistrust	-.25	.000	-.16	.011	-.19	.003	.24	.000	-.18	.005
Emotional deprivation	-.03	.607	-.27	.000	-.19	.002	.10	.121	-.11	.108
Defectiveness/ Unlovability	-.01	.882	-.21	.001	-.11	.089	.16	.014	-.12	.065
Social Isolation / Alienation	-.26	.000	-.21	.001	-.18	.005	.17	.007	-.14	.038
Practical Incompetence / Dependence	-.11	.102	-.10	.111	-.7	.009	.14	.032	-.14	.032
Vulnerability to Harm or Illness	.01	.984	-.17	.008	-.16	.014	.19	.003	-.10	.118
Enmeshment	-.12	.059	-.10	.126	-.11	.089	.15	.026	-.19	.003
Failure to Achieve	-.25	.000	-.15	.023	-.24	.000	.27	.000	-.21	.001
Entitlement / Superiority	-.05	.406	-.12	.066	-.15	.021	-.01	.837	-.18	.005
Insufficient Self Control/ Self Discipline	-.14	.035	-.24	.000	-.27	.000	.25	.000	-.15	.024
Subjugation	-.15	.018	-.16	.015	-.15	.021	.21	.001	-.19	.004
Self-sacrifice	-.14	.033	.01	.931	-.12	.053	.21	.001	-.09	.183
Admiration Recognition Seeking	-.04	.560	-.19	.002	-.17	.009	.23	.000	-.07	.275
Pessimism Worry	-.13	.050	-.05	.395	-.10	.128	.17	.010	-.10	.138
Emotional Inhibition	-.37	.000	-.19	.003	-.20	.002	.19	.004	-.20	.002
Unrelenting Standards	-.16	.016	-.10	.113	-.04	.524	.27	.000	-.03	.698
Self-Punitiveness	-.06	.357	-.12	.067	-.16	.015	.22	.001	-.02	.804

Study 2

The correlation analysis in Study 2 (Table 7) also partially confirmed H2 and H3 which presumed links between EMSs and personality traits. However, the patterns of the associations in Study 2 were somewhat different than those in Study 1. The results revealed that extraversion remained significantly negatively related to much fewer EMSs, namely just to mistrust, social isolation, failure to achieve, insufficient self-control, subjugation, self-sacrifice, pessimism, emotional inhibition, and unrelenting standards. Conscientiousness was significantly negatively related to 12 EMSs, and some pattern similarities were observed. Conscientiousness, like in Study 1, was not significantly related to abandonment, self-sacrifice and unrelenting standards but additionally, in Study 2, no significant correlations with enmeshment and pessimism/worry were observed. Open-mindedness in Study 2 was significantly negatively related to 10 EMSs, including enmeshment, like in Study 1, but no significant links with vulnerability to harm or admiration were observed. Agreeableness was also significantly negatively related to 10 EMSs, and, like in Study 1, we found negative links regarding mistrust, emotional deprivation, defectiveness/unlovability, failure to achieve, isolation/alienation, and vulnerability to harm. Finally, neuroticism was significantly positively associated with 16 EMSs. As in Study 1, neuroticism was not significantly related to entitlement/superiority, and, additionally, in Study 2, neuroticism was not significantly related to emotional deprivation.

Next, we performed a multiple linear regression analysis (enter method) to explore the specifics of associations between neuroticism and early maladaptive schemas in Study 2. The dependent variable was the neuroticism,

Table 8. Regressions of Associations between Neuroticism and Early Maladaptive Schemas in Study 2

Variables	*B*	*SE*	*β*	*t*	*p*	95.0% CI
(Constant)	2.4	.21		10.99	.000	[1.97, 2.83]
Emotional Deprivation	.02	.06	.03	0.37	.705	[-0.10, 0.15]
Abandonment	.08	.05	.11	1.41	.158	[-0.03, 0.19]
Mistrust	.12	.07	.19	1.82	.070	[-0.01, 0.26]
Isolation / Alienation	-.12	.08	-.17	-1.35	.178	[-0.29, 0.05]
Defectiveness / Unlovability	.03	.07	.04	0.43	.666	[-0.12, 0.18]
Failure to Achieve	.08	.06	.13	1.29	.196	[-0.04, 0.21]
Practical Incompetence / Dependence	.07	.07	.09	0.94	.348	[-0.07, 0.21]
Vulnerability to Harm	.09	.08	.12	1.16	.245	[-0.06, 0.26]
Enmeshment	-.09	.07	-.14	-1.26	.208	[-0.23, 0.05]
Subjugation	.03	.08	.04	0.33	.737	[-0.14, 0.20]
Self-Sacrifice	-.03	.08	-.03	-0.38	.704	[-0.19, 0.13]
Emotional Inhibition	-.03	.07	-.04	-0.37	.710	[-0.18, 0.12]
Unrelenting Standards	.16	.06	.24	2.43	.016	[0.03, 0.30]
Entitlement / Superiority	-.18	.06	-.24	-2.68	.008	[-0.31, -0.04]
Insufficient Self-Control	.10	.07	.13	1.33	.182	[-0.04, 0.24]
Admiration	.04	.06	.06	0.72	.471	[-0.08, 0.17]
Pessimism	-.18	.07	-.27	-2.34	.020	[-0.34, -0.03]
Self-Punitiveness	.08	.08	.10	1.02	.306	[-0.07, 0.24]

Note. Dependent variable: Neuroticism.

while the predictors were the eighteen EMSs, and we expected to replicate the findings of Study 1. Table 8 displays the results.

A significant regression equation was found ($F(18, 216) = 2.74$, $p < .001$, $R^2 = 0.19$). The schema of unrelenting standards contributed significantly to the model, indicating significant positive associations between unrelenting standards and neuroticism in Study 2. However, entitlement / superiority was negatively related to neuroticism. Thus, Study 2 failed to replicate the results of Study 1.

Discussion

The present study was based on the Big Five Personality Theory (McCrea & Costa, 1987; Costa & McCrae, 1990) and EMSs (Young, 1999; Young, Klosko, & Weishaar, 2003) models, which propose distinct but related constructs of personality traits and early maladaptive schemas. Both personality traits and EMSs remain stable and consistent over time (e.g., Calvete, Orue, & González-Diez, 2013); they shape how individuals perceive themselves and the world around them and can have a significant impact on psychological well-being.

This research assessed the relationship between EMSs and five personality traits in two samples of mentally healthy individuals. However, the samples represented two different cultural backgrounds. The findings complemented previous research on associations between personality traits and EMSs but also implicated some serious considerations related to the role of cultural factors or the specifics of the sample.

Neuroticism and EMSs

Based on previous studies (e.g., Bahramisadeh & Ehsan, 2011; Mącik, Łysiak, & Mącik, 2019), we assumed that neuroticism is associated with more EMSs than any other personality trait, as out of five personality traits, only neuroticism was linked to adverse effects on psychological well-being. As presumed, this study confirmed positive links between most of the EMSs and neuroticism. Previous research into the adaptive schema questionnaire (ASQ), created as a positive counterpart of the YSQ, showed that neuroticism was weakly negatively correlated with all subscales of the 6 ASQ (Jain & Singh, 2022). Studies 1 and 2 showed that neuroticism was positively linked to almost all of the 18 EMSs. The findings are somewhat in line with previous studies that demonstrated associations between negative thinking and worry (Stavropoulos et al., 2020), or evidenced that individuals with high levels of neuroticism tend to have more negative and severe schemas than those with low levels of neuroticism (Bahramisadeh & Ehsan, 2011; Mącik, Łysiak, & Mącik, 2019; Muris, 2006; Thimm, 2010), as individuals with high levels of neuroticism may probably be more susceptible to activating EMSs due to their tendency to experience negative emotions.

Previous research also evidenced that EMSs can contribute to developing certain personality traits. Study 1 showed that the abandonment schema might contribute to neuroticism which is also in line with previous research (Shojaati et al., 2019; Mącik, Łysiak, & Mącik, 2019). Several studies revealed links between the domain of disconnection/rejection, which includes the abandonment schema, and neuroticism (Mącik, Łysiak, & Mącik, 2019) or directly evidenced links between abandonment and neuroticism (Bahramisadeh & Ehsan, 2011).

In Study 1, entitlement/superiority was not associated with neuroticism, and this finding does not align with previous research, which demonstrated links between neuroticism and entitlement/superiority (Muris, 2006), although the results might reflect the specifics of the sample. The results of Study 2 showed that neuroticism was positively associated with unrelenting standards and negatively associated with entitlement/superiority, which is in line with previous research (Muris, 2006). It should be considered that Study 2 failed to replicate the results of Study 1, in which the schema of abandonment positively predicted neuroticism. The failure to replicate the results with a different sample demonstrates that the links between neuroticism and EMSs are complex. More research is needed to understand EMSs contributing to neuroticism across culturally different clinical and non-clinical samples.

Conscientiousness and EMSs

Based on previous research (e.g., Lungu & Stomff, 2017), we also assumed links between conscientiousness and EMSs. Previous research has shown that individuals with high levels of conscientiousness may have fewer and less severe schemas than those with lower conscientiousness (Muris, 2006; Lungu & Stomff, 2017). In Study 1, conscientiousness was negatively associated with almost all EMSs, with the exception of abandonment, self-sacrifice, and unrelenting standards. In study 2, conscientiousness was significantly negatively related to 12 EMSs, and, as in in Study 1, was not significantly related to abandonment, self-sacrifice, and unrelenting standards but additionally, in Study 2, no significant correlations were observed with enmeshment and pessimism. A previous study found that conscientiousness and domains of over-vigilance, inhibition, disconnection, and rejection exhibited significant correlation (Lungu & Stomff, 2017). The schema of isolation/alienation falls within these domains, supporting the findings of Study 1 and 2.

Overall, this study's findings confirmed that conscientiousness and early maladaptive schemas are related constructs, but the relationship between them is complex and needs further investigation, especially with large samples across different cultural contexts.

Extraversion and EMSs

In this research, we also assumed links between EMSs and extraversion, as previous studies, to some extent, evidenced that individuals with high levels of extraversion may have fewer and less severe schemas than those with lower levels of extraversion. In Study 1, extraversion was significantly negatively related to 12 EMSs, but no significant correlations were observed with emotional deprivation, vulnerability to harm, enmeshment, self-sacrifice, entitlement, and admiration. In Study 2, extraversion was significantly negatively related to fewer EMSs, namely just to mistrust, social isolation, failure to achieve, insufficient self-control, subjugation, self-sac-

rifice, pessimism/worry, emotional inhibition, and unrelenting standards. Previous research evidenced a correlation between extraversion and entitlement, social isolation, and emotional inhibition (Bahramizadeh & Ehsan, 2011), as well as a correlation between extraversion and the domain of disconnection/rejection, which includes the abandonment schema (Lungu & Stomff, 2017). The same study found a weaker but still significant correlation between the domain of other-directedness and extraversion. The domain of other-directedness includes the schema of self-sacrifice, suggesting that the findings in Study 1 and 2 partially align with previous studies. Moreover, previous research has shown a link between extraversion and abandonment, emotional deprivation, failure to achieve, enmeshment, and unrelenting standards (Etemadnia et al., 2021), which partially falls in line with the findings of this research.

Although Study 1 and Study 2 replicated the result of negative links between extraversion and several EMSs, this subject needs more research to understand associations between EMSs and extraversion across culturally different clinical and non-clinical samples.

Open-mindedness and EMSs

In this research, we also assumed that individuals with high levels of open-mindedness would have fewer and less severe schemas than those with lower levels of open-mindedness. In Study 1, open-mindedness was negatively associated with enmeshment and vulnerability to harm and positively associated with admiration. Open-mindedness in Study 2 was significantly negatively related to 10 EMSs, including enmeshment, like in Study 1, but no significant links were observed with vulnerability to harm or admiration. Previous research demonstrated negative correlations between open-mindedness, failure to achieve, and emotional inhibition (Thimm, 2010).

Overall, it is challenging to explain significant links between open-mindedness and EMSs (Rahnemazade & Khanmohammadiotaghsara, 2015; Zeighami, 2021); the relationship between these constructs needs further examination with large samples across different cultures.

Agreeableness and EMSs

Finally, we assumed that individuals with high levels of agreeableness might have fewer and less severe schemas than those with lower agreeableness. In Study 1, agreeableness was significantly negatively related to mistrust, emotional deprivation, defectiveness/unlovability, failure to achieve, isolation/alienation, practical incompetence/dependence, vulnerability to harm, pessimism/worry, and self-punitiveness, but no other significant correlations were found. In Study 2, agreeableness was significantly negatively related to 10 EMSs, and, like in Study 1, negative links were found regarding mistrust, emotional deprivation, defectiveness/unlovability, failure to achieve, isolation/alienation, and vulnerability to harm. Previous research indicated links between agreeableness and self-sacrifice (Thimm, 2010) or between agreeableness and vulnerability to harm and self-sacrifice (Lungu & Stomff, 2017), suggesting a consistency in results on links between agreeableness and some EMSs across different samples. Interestingly, previous research has confirmed negative links between the domain of disconnection and rejection and particular music preferences, which were also related to agreeableness (Yığman, 2021), suggesting that the schemas of emotional deprivation, alienation, emotional inhibition, defectiveness, and mistrust may have a negative correlation with agreeableness, but this presumption requires further research. Generally, although evidence exists that agreeableness and early maladaptive schemas are negatively related, more research is needed to understand the specifics of these links.

Overall, the findings revealed that personality traits and EMSs are related constructs in complex ways, but their links are still an area of future research. Most importantly, in Study 2, we partly failed to replicate the results of Study 1, which implies that the model of links between EMSs and personality traits is not established yet and should be approached cautiously. Most importantly, although the findings contribute to the global understanding of links between EMSs and five personality traits, they are specific to culturally different samples. Thus, the findings show that it's important to consider cultural and contextual factors in interpreting results on the links between EMSs and Big Five personality traits, and cross-cultural studies could highlight how cultural norms are related to the manifestations of EMSs and Big Five personality traits.

Strenghts and Limitations

On the whole, the results from Studies 1 and 2, examining the relationship between Big Five personality traits and EMSs in two culturally distinct samples, present several intriguing findings and raise important questions for future research.

Both studies established that neuroticism was positively associated with almost all of the 18 EMSs, indicating a general trend across cultures. However, specific differences emerged. In Study 1, neuroticism was not linked to entitlement/superiority, contrasting with previous research and suggesting potential sample-specific characteristics or cultural influences. In Study 2, neuroticism was positively related to unrelenting standards and negatively to entitlement/superiority, aligning with prior findings. This discrepancy between the two studies could be attributed to cultural differences or distinct sample characteristics. It highlights the necessity of further investigation to determine whether these differences are rooted in cultural factors or in the specific characteristics of the samples. Future research should focus on examining EMSs and big-five personality traits across a range of culturally diverse clinical and non-clinical samples to better understand the underlying reasons for these variations.

Next, several methodological considerations present themselves. The small sample size and the high number of items in the measurement tools used in these studies might have limited the reliability of CFA. Therefore, the results should be interpreted with caution, although Cronbach's α, a measure of internal consistency, can provide a degree of confidence in the reliability of the instruments used, even in the context of small sample sizes.

Thus, the current research's most significant limitation is the sample sizes and the specifics of the samples, especially combined with the large item numbers of the measurement tools. Due to the small sample sizes and high number of items in the measurement tools, the reliability of CFA in these studies might be compromised; therefore, the findings should be regarded with concern. In future research, we recommend analyzing the data of at least 800 individuals, preferably with genders represented equally and from homogenous cultural backgrounds and age groups, to obtain significant results. Next, due to a cross-sectional study design, predictions should be considered with criticism.

Subsequently, we would suggest applying additional measures to evaluate the participants' mental health in future research, as in this survey, we trusted the participants' opinions on their mental health.

Third, the BFI-2SF demonstrated a relatively low reliability and validity in Study 1, so to explore big-five personality traits, we suggest choosing the BFI-2 (as applied in Study 2) or other instruments instead of the BFI-2SF.

Next, this study was administered online, which might also impact the results; thus, generalizations should be made with concern.

Conclusion, Implications and Future Directions

The relationships between Big Five personality traits and early maladaptive schemas (EMSs) were examined in two studies. Both of these highlight the complex interplay between personality traits and early maladaptive schemas, with notable differences and similarities in their associations across two culturally diverse samples.

Study 1 Findings: Extraversion displayed a significant negative correlation with most EMSs, except for emotional deprivation, vulnerability to harm, enmeshment, self-sacrifice, entitlement, and admiration. Conscientiousness showed a significant negative relationship with nearly all EMSs, but not with abandonment, self-sacrifice, and unrelenting standards. Open-mindedness was negatively associated with vulnerability to harm and enmeshment, but positively correlated with admiration. Agreeableness had a significant negative correlation with various EMSs, including mistrust, emotional deprivation, defectiveness/unlovability, failure to achieve, isolation/alienation, practical incompetence/dependence, vulnerability to harm, pessimism, and self-punitiveness. Neuroticism was positively related to most EMSs (17 in total), except for entitlement/superiority, and had a notable positive association with abandonment.

Study 2 Findings: Extraversion negatively correlated with mistrust, social isolation, failure to achieve, insufficient self-control, subjugation, self-sacrifice, pessimism, emotional inhibition, and unrelenting standards. Conscientiousness negatively associated with 12 EMSs, similar to Study 1, having no significant relationship with abandonment, self-sacrifice, unrelenting standards, enmeshment, and pessimism/worry. Open-mindedness showed negative correlations with 10 EMSs, including enmeshment (as in Study 1), but no significant link with vulnerability to harm or admiration. Agreeableness negatively correlated with 10 EMSs, consistent with Study 1,

including mistrust, emotional deprivation, defectiveness/unlovability, failure to achieve, isolation/alienation, and vulnerability to harm. Neuroticism was positively associated with 16 EMSs and showed a significant positive link with unrelenting standards.

Although some results are partly in line with previous research, the findings revealed that personality traits and EMSs are related constructs in complex ways, and their links still constitute an area of future research. Most importantly, Study 2 partly failed to replicate the results of Study 1.

While this research enhances the global comprehension of the relationship between EMSs and Big Five personality traits, its findings are distinct to samples from diverse cultural backgrounds. This emphasizes the significance of acknowledging cultural and contextual influences when interpreting the connections between EMSs and Big Five personality traits. Conducting comparative researches in various cultural settings with large samples can aid in discerning the universal and context-specific aspects of the relationship between EMSs and the Big Five personality traits.

Analyzing the results from Studies 1 and 2, which focused on the relationship between Big Five personality traits and EMSs in two culturally distinct samples, we can draw several insights and implications for future research.

Both studies universally found a positive link between neuroticism and the majority of the 18 EMSs. This consistency suggests a robust relationship between neuroticism and EMSs across different cultural contexts. In Study 1, however, no association was found between neuroticism and entitlement/superiority, contradicting previous research (Muris, 2006). This discrepancy might be attributed to the sample's specific characteristics, possibly reflecting unique cultural influences or sample-specific traits. Conversely, Study 2 aligned with earlier findings, showing a positive association between neuroticism and unrelenting standards and a negative association with entitlement/superiority. The difference in these results compared to Study 1 could be due to cultural variations, as the two studies involve samples from different backgrounds. On the whole, the differences in the association between neuroticism and the EMSs across the two studies highlight the necessity of further investigation to determine whether these differences are rooted in cultural factors or sample characteristics.

The inconsistency in the relationship between Big Five personality traits and EMSs across the two studies highlights the complexity of these relationships and the need for further research. Future studies should specifically explore which EMSs consistently predict neuroticism in diverse cultural contexts to gain a deeper understanding of its underlying dynamics.

Then, participants in the previous studies were mainly outpatients from psychiatric clinics who suffered from various symptoms, and the participants of the present study were mentally healthy individuals. Previous research found a much higher score in 16 of the 18 EMSs in a clinical group compared to a non-clinical group (Shorey, Stuart, & Anderson, 2014). We suggest considering differences in the activation of EMSs in clinical and non-clinical samples.

Overall, this research underscores the necessity to explore how cultural differences and sample-specific characteristics may influence the relationship between personality traits and EMSs. Future studies should aim to disentangle these factors to gain a clearer understanding of their respective impacts. This could involve using larger, more diverse samples and employing methodologies that specifically address cross-cultural comparisons. Additionally, exploring these relationships in various clinical and non-clinical settings could provide valuable insights into how these dynamics manifest in different populations.

Finally, in future research, we recommend exploring links between EMSs, personality traits, and adaptive schemata, as these explorations might provide hopeful suggestions for professionals working in the healthcare sector.

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Author contribution

Aiste DIRZYTE: conceptualization, design, methodology, investigation, project administration, formal analysis, interpretation, supervision, writing original draft.
Aidas PERMINAS: conceptualization, writing review and editing.
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Declaration of interest statement
The author declares no conflict of interest.

Ethical statement
All participants engaged in the research voluntarily and anonymously.
The participants provided their written informed consent to participate in this study.
Their data are stored in coded materials and databases without personal data.
The studies involving human participants were reviewed and approved by the Institutional Review Board of the Institute of Management and Psychology, VIPI-INT-2022-02.

Data Availability Statement
The data supporting this study's findings are available to the public.
We have policies in place to manage and keep data secure.

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References

Bahramizadeh, H., & Ehsan, H. B. (2011). The evaluation of prediction potential neuroticism and extraversion according to early maladaptive schemas. *Procedia – Social and Behavioural Science, 30*, 524–529. https://doi.org/10.1016/j.sbspro.2011.10.102

Barańczuk, U. (2019). The five factor model of personality and social support: A meta-analysis. *Journal of Research in Personality, 81*, 38–46. https://doi.org/10.1016/j.jrp.2019.05.002

Bilge, Y., & Balaban, G. (2021). The relationships between personality disorders and early maladaptive schemas and the moderating role of gender. *Alpha Psychiatry, 22*(1), 12–18. https://doi.org/10.5455/apd.114935

Calvete, E., Orue, I., & González-Diez, Z. (2013). An examination of the structure and stability of early maladaptive schemas by means of the Young Schema Questionnaire-3. *European Journal of Psychological Assessment, 29*(4), 283–290. https://doi.org/10.1027/1015-5759/a000158

Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: Stability and change. *Annual Review of Psychology, 56*(1), 453–484. https://doi.org/10.1146/annurev.psych.55.090902.141913

Costa, P. T., & McCrae, R. R. (1990). Personality disorders and the five-factor model of personality. *Journal of Personality Disorders, 4*(4), 362–371. https://doi.org/10.1521/pedi.1990.4.4.362

Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D.-w., Oishi, S., & Biswas-Diener, R. (2010). *Flourishing Scale (FS)* [Database record]. APA PsycTests. https://doi.org/10.1037/t03126-000

Ehsan, H. B., & Bahramizadeh, H. (2011). Early maladaptive schemas and agreeableness in personality five factor model. *Procedia – Social and Behavioral Sciences, 30*, 547–551. https://doi.org/10.1016/j.sbspro.2011.10.107

Esmaeilian, N., Dehghani, M., Koster, E. H. W., & Hoorelbeke, K. (2019). Early maladaptive schemas and borderline personality disorder features in a non-clinical sample: A network analysis. *Clinical Psychology & Psychotherapy, 26*(3), 388–398. https://doi.org/10.1002/cpp.2360

Etemadnia, M., Shiroodi, S., Khalatbari, J., & Abolghasemi, S. (2021). Predicting love trauma syndrome in college students based on personality traits, early maladaptive schemas, and spiritual health. *Iranian Journal of Psychiatry and Clinical Psychology, 27*(3), 318–335. https://doi.org/10.32598/ijpcp.27.2.1096.2

Frías, A., Navarro, S., Palma, C., Farriols, N., Aliaga, F., Salvador, A., Aluco, E. Martínez, B., & Solves, L. (2018). Early maladaptive schemas associated with dimensional and categorical psychopathology in patients with borderline personality disorder. *Clinical Psychology & Psychotherapy, 25*(1), e30–e41. https://doi.org/10.1002/cpp.2123

Güler, K., & Özgörüş, Z. (2022). Investigation of the relationship between early maladaptive schemas, temperament and eating attitude in adults. *Journal of Eating Disorders, 10*, Article 187. https://doi.org/10.1186/s40337-022-00711-w

George, D., & Mallery, M. (2010). *SPSS for Windows Step by Step: A Simple Guide and Reference, 17.0 Update.* (10th Edition). Pearson.

Goldberg, L. R. (1990). An alternative "description of personality": The big-five factor structure. *Journal of Personality and Social Psychology, 59*(6), 1216–1229. https://doi.org/10.1037/0022-3514.59.6.1216

Graziano, W. G., Habashi, M. M., Sheese, B. E., & Tobin, R. M. (2007). Agreeableness, empathy, and helping: A person × situation perspective. *Journal of Personality and Social Psychology, 93*(4), 583–599. https://doi.org/10.1037/0022-3514.93.4.583

Headey, B., Muffles, R., & Wagner, G. G. (2010). Long-running German panel survey shows that personal and economic choices, not just genes, matter for happiness. *Proceedings of*

the National Academy of Sciences, 107(42), 17922–17926. https://doi.org/10.1073/pnas.1008612107

Jain, A., & Singh, K. (2022). Development and validation of the Adaptive Schema Questionnaire. *Indian Journal of Psychological Medicine*, *45*(5), 476–485. https://doi.org/10.1177/02537176221105146

Koppers, D., Van, H., Peen, J., & Dekker, J. J. M. (2021). Psychological symptoms, early maladaptive schemas and schema modes: predictors of the outcome of group schema therapy in patients with personality disorders. *Psychotherapy Research, 31*(7), 831–842. https://doi.org/10.1080/10503307.2020.1852482

Lungu, V., & Stomff, M. (2017). The early maladaptive cognitive schemas and personality traits in emerging adulthood. *LUMEN Proceedings, 1,* 424–437. https://doi.org/10.18662/lumproc.rsacvp2017.39

Mącik, D., Łysiak, M., & Mącik, R. (2019). Mediating role of neuroticism between early maladaptive schemas and negative emotionality. *Current Issues in Personality Psychology, 7*(3), 220–231. https://doi.org/10.5114/cipp.2019.88583

McCrae, R., & Costa P. T. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology, 52*(1), 81–90. https://doi.org/10.1037/0022-3514.52.1.81

Pauwels, E., Dierckx, E., Schoevaerts, K., & Claes, L. (2016). Early maladaptive schemas in eating disordered patients with or without non-suicidal self-injury. *European Eating Disorders Review, 24*(5), 399–405. https://doi.org/10.1002/erv.2460

Phillips, K., Brockman, R., Bailey, P. E., & Kneebone, I. I. (2017). Young Schema Questionnaire – Short Form Version 3 (YSQ-S3): Preliminary validation in older adults. *Aging & Mental Health, 23*(1), 140–147. https://doi.org/10.1080/13607863.2017.1396579

Rahnemazade, M., & Khanmohammadiotaghsara, A. (2015). The relation of early maladaptive schemas with five-factor personality traits and their difference amongst first, middle and last-born children. A case study of Amol city-Iran. *Indian Journal of Fundamental and Applied Life Sciences, 5*(S1), 2019–2026. www.cibtech.org/sp.ed/jls/2015/01/jls.htm

Sava, F. A. (2009). Maladaptive schemas, irrational beliefs, and their relationship with the five-factor personality model. *Journal of Cognitive and Behavioral Psychotherapies, 9*(2), 135–147.

Schretlen, D. J., van der Hulst, E.-J., Pearlson, G. D., & Gordon, B. (2010). A neuropsychological study of personality: Trait openness in relation to intelligence, fluency, and executive functioning. *Journal of Clinical and Experimental Neuropsychology, 32*(10), 1068–1073. https://doi.org/10.1080/13803391003689770

Shojaati, A., Kalantari, M., & Mulavi, H. (2019). Do emotional abuse and personality traits predict early maladaptive schemas and social anxiety. *Early Child Development and Care, 191*(3), 389–402. https://doi.org/10.1080/03004430.2019.1621860

Shorey, R. C, Stuart, G. L., & Anderson, S. (2014). Differences in early maladaptive schemas between a sample of young adult female substance abusers and a non-clinical comparison group. *Clinical Psychology & Psychotherapy, 21*(1), 21–28. https://doi.org/10.1002/cpp.1803

Soto, C. J., & John , O. P. (2017a). The next Big Five Inventory (BFI-2): Developing and assessing a hierarchical model with 15 facets to enhance bandwidth, fidelity, and predictive power. *Journal of Personality and Social Psychology, 113*(1), 117–143. https://doi.org/10.1037/pspp0000096

Soto, C. J., & John, O. P. (2017b). Short and extra-short forms of the Big Five Inventory–2: The BFI-2-S and BFI-2-XS. *Journal of Research in Personality, 68*, 69–81. https://doi.org/10.1016/j.jrp.2017.02.004

Stavropoulos, A., Haire, M., Brockman, R., & Meade, T. (2020). A schema mode model of repetitive negative thinking. *Clinical Psychologist, 24*(2), 99–113. https://doi.org/10.1111/cp.12205

Steel, P., Schmidt, J., Bosco, F., & Uggerslev, K. (2018). The effects of personality on job satisfaction and life satisfaction: A meta-analytic investigation accounting for bandwidth–fidelity and commensurability. *Human Relations, 72*(2), 217–247. https://doi.org/10.1177/0018726718771465

Stieger, M., Wepfer, S., Rüegger, D., Kowatsch, T., Roberts, B. W., & Allemand, M. (2020). Becoming more conscientious or more open to experience? Effects of a two–week smartphone–based intervention for personality change. *European Journal of Personality, 34*(3), 345–366. https://doi.org/10.1002/per.2267

Thimm, J. C. (2010). Relationships between early maladaptive schemas and psychosocial developmental task resolution. *Clinical Psychology & Psychotherapy, 17*(3), 219–230. https://doi.org/10.1002/cpp.647

Thimm, J. C. (2011). Incremental validity of maladaptive schemas over five-factor model facets in the prediction of personality disorder symptoms. *Personality and Individual Differences, 50*(6), 777–782. https://doi.org/10.1016/j.paid.2010.12.030

Tong, K. K., & Wang, Y. Y. (2017). Validation of the flourishing scale and scale of positive and negative experience in a Chinese community sample. *PLOS ONE, 12*(8), Article e0181616. https://doi.org/10.1371/journal.pone.0181616

Wilt, J. A, & Revelle, W. (2009). Extraversion. In M. R. Leary & R. H. Hoyle (Eds.). *Handbook of individual differences in social behavior*, pp. 27–45. Guilford Press.

Yığman, F., Aksu, M. H., Nazlı, Ş. B., & Duman, A. (2021). Psychological determinants of entertainment preferences: From the perspective of schema theory. *Psychiatry and Clinical Psychopharmacology, 31*(4), 417–424. https://doi.org/10.5152/pcp.2021.21132

Young, J. E. (1999). *Cognitive therapy for personality disorders: A schema-focused approach* (3rd ed.). Professional Resource Exchange.

Young, J. E., & Brown, G. (2005). *Young Schema Questionnaire-Short Form; Version 3 (YSQ-S3, YSQ)* [Database record]. APA PsycTests. https://doi.org/10.1037/t67023-000

Young, J. E. (2014). *Early maladaptive schemas.* Schema Therapy Institute.

Young, J. E., Klosko, J. S., & Weishaar, M. E. (2003). *Schema Therapy: A Practitioner's Guide.* Guilford Press.

Zeighami, R., Hosseini, S. M., Mohammadi, N., & Shahsavari, S. (2021). Predicting addiction susceptibility based on big five personality traits. *Iranian Journal of Psychiatry and Behavioral Sciences, 15*(4), Article e10903. https://doi.org/10.5812/ijpbs.109103

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RESEARCH ARTICLE

Features of Polypharmacy in Dutch Older Outpatients with Personality Disorders: A Cross-Sectional Study

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Introduction: Pharmacotherapy in older adults with personality disorders (PDs) can be even more complicated compared to younger adults, because older adults stand at risk for polypharmacy and its negative consequences due to somatic comorbidities and biological age-related changes.
Aims: This study's primary objective serves to describe the point prevalence of polypharmacy in older adults with PDs. Next, we described 1) the number of psychotropics employed, 2) classes of psychotropics, 3) the number of somatic medication, and 4) the anticholinergic burden of the total medication.
Methods: This cross sectional study was performed at a clinical center of excellence for older adults with PDs in the Netherlands. Fifty outpatients aged 65 years and older with a primary diagnosis of a PD were selected from an alphabetically ordered list. Data from the files on polypharmacy (use of five medications or more daily), use of medication and the anticholinergic burden (ARS score) was collected.
Results: Polypharmacy was present in 72% of older adults with PDs. The mean number of psychotropics was 2.0 (*SD = 1.4*) psychotropics per person, for somatic medication the mean was 6.2 (*SD = 3.6*). Antidepressants were the most frequently prescribed (used by 62%), followed by anxiolytics (used by 40%). The mean ARS score was 1.1 points (*SD = 1.7*).
Conclusions: The prevalence of polypharmacy in older adults with PDs stands high, due to the high use of both psychotropics and somatic medication. Although this study provides important and new information on the use of medication in older adults, its representation of the population may be limited due to the tertiary care setting and small sample size excluding certain PDs (e.g., schizoid or obsessive-compulsive PD). Also, we did not register or measure the consequences of polypharmacy.

Keywords: polypharmacy, pharmacotherapy, anticholinergic burden, personality disorders, geriatric psychiatry

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Case Study

Mrs. B., a 67-year-old woman known to suffer from lacunar stroke and hypertension, visited our Clinical Center of Excellence for Older Adults with Personality Disorders and was diagnosed with borderline personality disorder (BPD). She was voluntarily admitted to a psychiatric emergency department for older adults for 11 months because of suicidal ideations. Subsequently she was followed up at our outpatient clinic.

From the age of 25, she had an extensive history of recurrent depressions and anxiety disorders. Throughout the years, she was treated at various institutions and clinical wards, and thus received many psychiatric treatments prescribed by various psychiatrists. Treatments for depression consisted of pharmacotherapy, intensive group-therapy, and mindfulness. Treatment became more focused on pharmacotherapy, activation, and structuring daily life, as psychotherapy was not effective. Pharmacotherapy was mostly symptom-based, not always following existing guidelines. This could be due to the lack of continuity by the treating physicians, but also due to the high level of suffering that the patient expressed.

At the start of the 11-month admission, Mrs. B. was using eight medications. Nortriptyline 75 mg daily (plasma level of 96 ug/L) with mirtazapine 15 mg daily augmentation was indicated for the treatment of depression, while olanzapine 10 mg daily was prescribed off-label for insomnia. Amlodipine 5 mg daily, clopidogrel 75 mg daily, hydrochlorothiazide 25 mg daily and simvastatin 40 mg daily were prescribed for the treatment of hypertension and lacunar strokes and pantoprazole 40 mg daily was prescribed for stomach complaints. During the stay at our ward and outpatient follow up, several medications were changed by various psychiatrists and general practitioners for various indications. To treat depression, first lithium 400 mg (plasma level 0.58 mmol/L) was added. After three months the treatment was discontinued due to its inefficacy and the patient developing a tremor. Subsequently, nortriptyline was discontinued because of a prolonged QT interval (475 msec), which normalized after cessation (441 msec). Both were replaced by escitalopram 10 mg daily. Sometime around the start the patient developed a tinnitus. Tinnitus is reported as a possible side effect of escitalopram. The patient could not cope with tinnitus and developed suicidal thoughts. She was therefore no longer willing to use the escitalopram, but discontinuation did not improve the tinnitus. Escitalopram was then replaced by bupropion 150 mg daily. The patient became more active, but the subjective feeling of depressed mood did not improve. To treat mood instability and impulsivity related to BPD, valproic acid 1200 mg daily (plasma level 74 mg/L) was started. Several informants, such as practitioners and family, reported a positive influence on mood stability. The patient herself did not experience any improvement. For the treatment of insomnia, zopiclon 7.5 mg was prescribed. This did not have an effect, which is why it was replaced by temazepam 20 mg. Because of insufficient response, promethazine 25 mg was added (off-label). To treat anxiety, alprazolam 0.5 mg daily was added for a short period of time. To treat tension headache, diazepam 2 mg as well as fentanyl patches (50 ug/hour 1 patch every three days) were prescribed, the latter because of a spondylolisthesis as a result of falling. At the end of this period, Mrs. B. was using 14 medications daily.

She developed several somatic signs and symptoms that could be related to drug side effects: tremor (could be a side effect of lithium), prolonged QT interval (could be due to nortriptyline use), tinnitus (known side effect of escitalopram and amlodipine), weight gain (possibly related to olanzapine), sedation and falling incidents (both can be caused or worsened due to the sedative effects of psychotropics and the high anticholinergic burden of the total medication). At the outpatient clinic, pharmacotherapy was thoroughly evaluated by means of a medication review. Together with the pharmacist, indications for all the prescriptions were checked. After this, sedative medication (fentanyl, diazepam, alprazolam and promethazine) was tapered and discontinued. Mrs. B. became more active and less sedated.

Introduction

As the case description above illustrates, pharmacotherapy in older adults with personality disorders (PDs) can be complicated, which can easily lead to polypharmacy. Multiple definitions of polypharmacy exist in literature, but the most commonly used is the use of five or more drugs daily (regardless of ATC code) (Masnoon et al., 2017). Other used terms are excessive polypharmacy (use of 10 or more drugs daily) (Kann et al., 2015), psychiatric polypharmacy (use of 2 or more psychotropics daily) (Sarkar, 2017) and appropriate versus inappropriate polypharmacy (often using tools such as the Beers criteria to assess appropriateness) (Beers, 1997; Maggiore et al., 2010).

The prevalence of polypharmacy increases substantially with age and multimorbidity (Slabaugh et al., 2010). In the Netherlands, polypharmacy occurs in 44.3% of community dwelling older adults (aged 65 years and older) (Dijk et al., 2009). Over the last few decades, several studies have reported an increase in the use of prescription medication worldwide (Charlesworth et al., 2015; Nishtala & Salahudeen, 2015; Wastesson et al., 2016).

A recent review showed that, due to changes in pharmacodynamics, older adults are even more vulnerable to the consequences of polypharmacy (Kratz & Diefenbacher, 2019). Altered dopaminergic, serotonergic, and cholinergic systems can lead to an increased risk for extrapyramidal symptoms, agitation, urinary retention and even delirium (Kratz & Diefenbacher, 2019). Polypharmacy has also been associated with drug-drug interactions (Doan et al., 2013), adverse drug events (Bourgeois et al., 2010), falling (Fried et al., 2014), frailty (Gutiérrez-Valencia et al., 2018), mortality (Leelakanok et al., 2017) and cognitive impairment (Jyrkkä et al., 2011), including dementia (Park et al., 2017). Other potentially negative consequences of polypharmacy are the increased risk for potentially inappropriate medications (PIMs) (Tian et al., 2022) and increased anticholinergic burden, which means the cumulative drug effects of taking one or more drugs with anticholinergic properties (Tune, 2001; Mate et al., 2015). Use of drugs with high anticholinergic activity has been linked with cognitive impairment (Fox et al., 2014) and impaired physical functioning in older adults (Lampela et al., 2013).

In psychiatric populations, polypharmacy is a common issue; up to one-third of adult and older adult patients visiting an outpatient psychiatric department use three or more psychotropic drugs (Mojtabai & Olfson, 2010). In younger adults with PDs (six years after psychiatric admission), 10% of all patients use five or more medications daily (Zanarini et al., 2004). It is likely that older adults with PDs are exposed to even more polypharmacy, because they bear a higher risk of multimorbidity and they are more likely to use somatic medication (Slabaugh et al., 2010); however, due to the lack of research data, no exact percentages are known.

PDs are highly prevalent in older adults; rates of 10.6–14.5% in community dwelling older adults to 57.8% in nursing home residents are reported (Penders et al., 2020). Polypharmacy and its consequences may thus impact on healthcare facilities and the patients' quality of life (Montiel-Luque et al., 2017).

Medication reviews by a clinical pharmacist are an effective strategy to reduce inappropriate polypharmacy in older adults with mental disorders, reducing the total number of medications, PIMs, and potential drug-drug interactions (Stuhec & Lah, 2021). We performed a descriptive cross-sectional study in our tertiary outpatient clinic for PDs in older adults. This study's primary objective was to describe the point prevalence of polypharmacy in older adults with PDs. Next, we described 1) the number of psychotropics that were used, 2) classes of psychotropics, 3) the number of somatic medications and 4) the anticholinergic burden of the total medication.

Methods

Participants and Procedure

This study was performed in the month of May in 2017, in a Clinical Center of Excellence for Older Adults with Personality Disorders (tertiary care) at Heerlen, the Netherlands. We studied 50 consecutive patients from our outpatient department with a primary diagnosis of a PD according to the Diagnostic and Statistical Manual of Mental Disorders (DSM) IV (American Psychiatric Association, 1994), age 65 years or older. Comorbidity was allowed, as long as the primary diagnosis was a PD. It was estimated that fifty older adults with PDs would be enough to explore and give insight in the use of medication, which was the aim of this study. A patient case file study was carried out in fifty patient files of patients older than 65 years and with a primary PD diagnosis, obtained randomly from our population of older adults being treated for a PD at our outpatient clinical center. To obtain a sample that accurately represents our patient population and to avoid selection bias, patients were selected from an alphabetically ordered list of all patients receiving care at the Clinical Center of Excellence for

Older Adults with Personality Disorders at the time of inclusion. When 50 patients aged 65 years and older with a primary PD diagnosis were selected, the selection process was finished. For all participants, an informed consent to participate in scientific research was recorded in the patient files, as this is a standard procedure in our patient care process. We informed the participants that we would like to collect data on the use of medication to explore our treatment population. We informed the participants that their data would be anonymized and could not be tracked back to their personal data. They could agree or refuse, which was recorded in their file. We chose this design of consent because of the non-invasive and observational nature of this study. This study was not subject to the WMO (Dutch legislation for medical research in humans), because participants were not subjected to actions nor were behavioral rules imposed on them. It was therefore not obligatory to have it reviewed by a medical ethical committee. European General Data Protection Regulation (GDPR) only started in 2018, a year after this study took place.

Personality assessment was carried out using a standardized procedure based on the LEAD (Longitudinal, Expert, All Data) standard (Spitzer, 1983), which integrates information from the patient, informants, and additional psychological tests. These provisional PDs diagnoses were then discussed in a multidisciplinary team (psychiatrist, psychologist(s) and psychiatric nurse(s)) in order to reach consensus for a definite diagnosis of PD.

This was a cross-sectional study. The study follows the STROBE protocol for cross-sectional studies.

Measurements

Information on demographics (age and gender) and DSM-IV mental disorders at the date of the research assessment was extracted from 'mijnQuarant', an electronic health record. The electronic prescribing system of mijnQuarant contains the medication mentioned in the referral letter. When this information was unclear or no longer up to date, informed consent was asked from the treating physician to check the current medication use via contacting the patient's pharmacy. Polypharmacy was defined as the use of five medications or more daily, regardless of ATC3-code or dosage (Masnoon et al., 2017). Medication was categorized by indication into the subtypes of psychotropics or somatic medication. In case medication could be prescribed for both somatic and psychiatric indication (e.g., promethazine can be prescribed to treat allergy symptoms or to sedate in case of sleeping disorders or anxiety), we checked what the indication was, or if this information were not available, who prescribed the medication (e.g., a psychiatrist, which makes psychiatric indication more likely, or a general practitioner). Anticholinergic burden was assessed using the Anticholinergic Risk Scale (ARS) (Rudolph et al., 2008). The ARS is a ranked categorical list of commonly prescribed medications with anticholinergic potential, which predicts the risks of anticholinergic adverse effects at a given point in time. The ARS ranks medications for anticholinergic potential on a 3-point scale (0: no or low risk; 3: high anticholinergic potential). The ARS score reflects the total sum of points.

Data collection took place when the DSM IV's classification system was used in clinical practice in the Netherlands. All classifications are therefore recorded in DSM IV terms.

Statistical Analysis

We used descriptive statistics to describe the percentage or range, mean, and standard deviation (*SD*) of demographic variables, point prevalence of polypharmacy, use of psychotropics and somatic medication, and ARS score. Following a rule of thumb (Allende-Alonso et al., 2019), every group of PD would have to contain 30 patients to be able to detect differences between groups with statistical tests. We aimed to include only 50 patients in total, since the objective of this study was to explore and describe the use of medication, instead of testing. Therefore, no power analysis was performed.

Statistical analyses were performed using SPSS 19.0 for Windows.

Results

The mean age of the total study population was 73.2 years (ranging from 65 to 92 years) and 64% were female. Most patients (54%) were diagnosed as PD Not Otherwise Specified (NOS). Patients with paranoid, schizoid, schizotypal, histrionic or obsessive-compulsive PD were not included in this study. Polypharmacy was present in 72% of older adults with PDs and in 76.9% of older adults with BPD. Results are shown in Table 1.

Antidepressants were the most prescribed psychotropics in the total study population; 62% of included patients used antidepressants, followed by anxiolytics (used by 40%). Results were also reported for various types of PDs (Table 2).

The number of psychotropics in the total study population ranged between 0 and 6 prescriptions, with a mean of 2.0 (*SD* = *1.4*) psychotropics per person.

The number of somatic medications in the total study population ranged between 0 and 14 prescriptions, with a mean of 6.2 (*SD* = *3.6*) somatic medications per person (Figure 1).

In the total study population, the anticholinergic burden, represented by the ARS score, ranged from 0 to 6 points, with a mean of 1.1 points (*SD* = *1.7*) (Figure 2). The BPD group showed the highest mean and the largest variation in

Table 1. Patient characteristics in a study sample of older adults with personality disorders

Characteristic	*N* = 50
Sex, *n* (%)	
Males, *n* (%)	18 (36%)
Females, *n* (%)	32 (64%)
Age in years, M*(SD)*	73.2*(6.4)*
Subtype of personality disorder, *n* (%)	
Borderline	13 (26%)
Narcissistic	2 (4%)
Avoidant	4 (8%)
Dependent	4 (8%)
NOS	27 (54%)
Polypharmacy, *n* (%)	36 (72%)
Number of comorbid psychiatric disorders, M*(SD)*	0–4 2.0*(0.9)*
ARS score M*(SD)*	0–6 1.1*(1.7)*

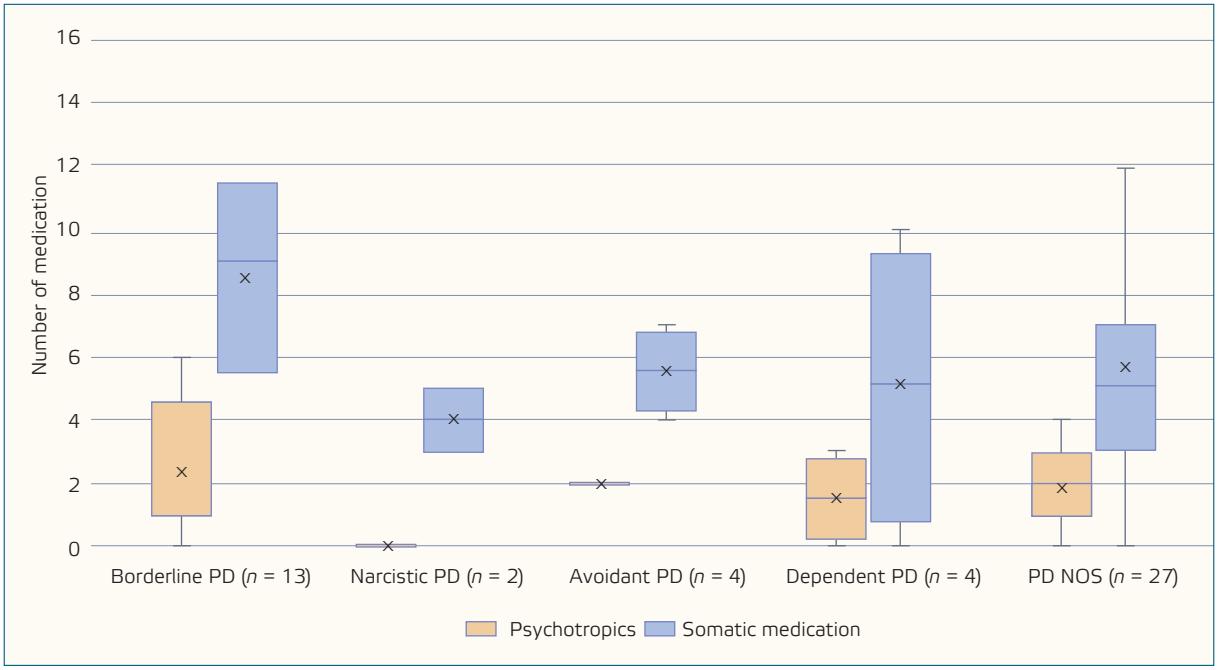
n = sample size, SD = standard deviation, PD = personality disorder, NOS = not otherwise specified, ARS = anticholinergic risk scale

Table 2. Use of various psychotropics for every group of personality disorder in older adults of the study sample

Variables	Total	Borderline	Narcissistic	Avoidant	Dependent	NOS
N(%)	50 (100%)	13 (26%)	2 (4%)	4 (8%)	4 (8%)	27 (54%)
Use of antipsychotics, *n* (%)	17 (34%)	4 (30.8%)	0	1 (25%)	1 (25%)	11 (40.7%)
Use of antidepressants, *n* (%)	31 (62%)	10 (76.9%)	0	4 (100%)	2 (50%)	15 (55.6%)
Use of mood stabilizers, *n* (%)	4 (8%)	1 (7.7%)	0	1 (25%)	0	2 (7.4%)
Use of anxiolytics, *n* (%)	20 (40%)	6 (46.2%)	0	2 (50%)	2 (50%)	10 (37%)
Use of sleep medication, *n* (%)	16 (32%)	6 (46.2)	0	0	0	10 (37%)

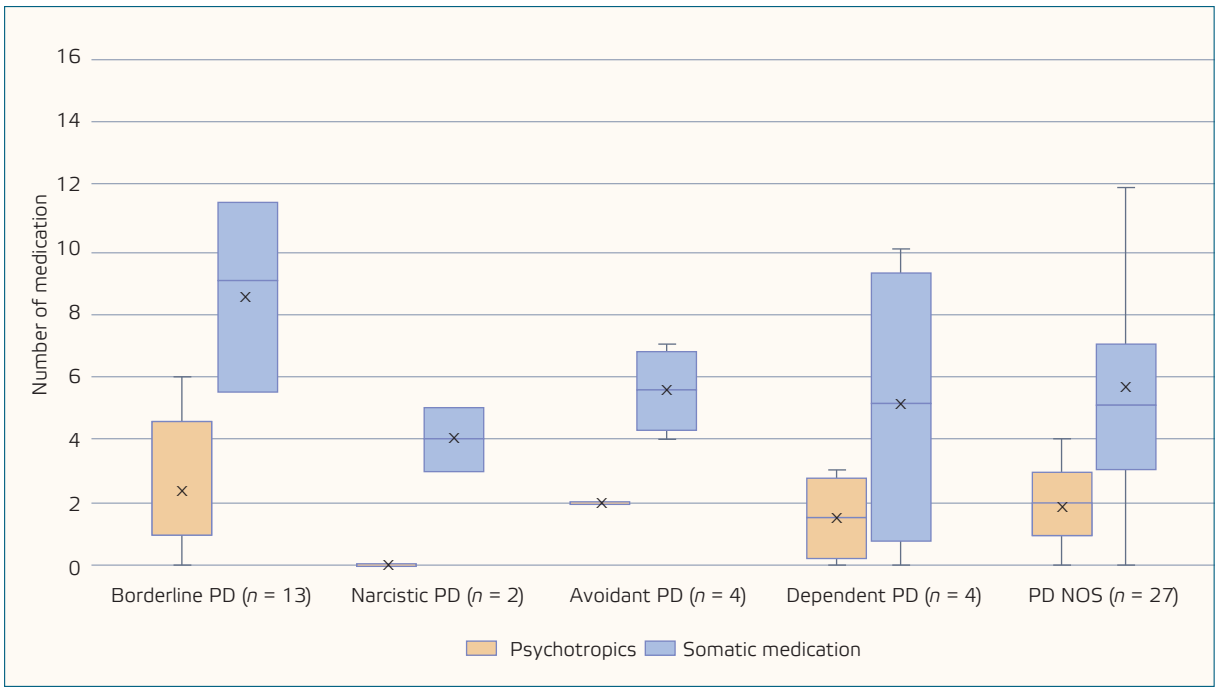
NOS = not otherwise specified, *n* = sample size

Figure 1. Distribution of data on use of medication amongst various groups of personality disorders in older adults of the study sample



PD = personality disorder, NOS = not otherwise specified, *n* = sample size

Figure 2. Distribution of the Anticholinergic Risk Scale-score, representing anticholinergic burden, amongst various groups of personality disorders in the study sample of older adults



ARS = anticholinergic risk scale, PD = personality disorder, NOS = not otherwise specified, *n* = sample size

ARS score, compared to the total group and compared to the other PD groups. However, no statistical tests were performed to test for significance.

Discussion

This study aimed to describe rates and features of polypharmacy, such as the use of psychotropics, use of somatic medication, and anticholinergic burden. To summarize, 72% of our sample including older adults with PDs had been exposed to polypharmacy. The mean number of psychotropics was 2.0 prescriptions per person, while the mean number of somatic medications was 6.2 prescriptions per person, and the mean anticholinergic burden in our study sample was 1.1 points.

In the Netherlands, 44.3% of community dwelling older adults use five or more medications daily (Dijk et al., 2009) and 20% use ten or more medications daily (Lemmens & Weda, 2015). In our study, focusing on a population of older adults with PDs, these numbers were even higher; 72% and 32%, respectively. The observed rate of polypharmacy in our study stands not only higher compared to community dwelling older adults, but also compared to younger adults with PDs, in whom rates of 10% have been reported (Zanarini et al., 2004).

There are some explanations for the high prevalence of polypharmacy in older adults with PDs. First of all, older adults with PDs, and older adults with mental disorders in general, are often excluded from randomized controlled trials. Due to this paucity of efficacy studies in older adults with PDs, treatment recommendations are based on studies with patients up to 50 years of age (American Psychiatric Association Practice Guidelines, 2001). Experts in treatment of PDs in older adults were consulted on their view on pharmacotherapy in older adults with PDs. They agreed that pharmacotherapy can be appropriate in older adults with PDs for the symptom based treatment of PDs, but the experts commented that psychiatrists have to rely on guidelines and studies which are aimed at younger to middle-aged adults with PDs, and therefore have to depend on their own knowledge, intuition, and clinical experience to translate recommendations to older adults (Schulkens et al., 2021). Lack of evidence-based recommendations may lead to an inappropriate prescribing and polypharmacy. Besides, somatic comorbidities are in general more prevalent in older adults compared to younger adults (Taylor et al., 2010), which can lead to a larger use of somatic medications, contributing to polypharmacy. Our data confirmed that the use of somatic medication constituted the most substantial component of polypharmacy in older patients with PDs, compared to the use of psychotropics. In line with our findings, in older adults having mental-physical multimorbidity living in geropsychiatric nursing homes, a

median number of seven somatic medications and a mean 2.3 psychotropics were reported per person (van den Brink et al., 2017). Although we did not investigate somatic comorbidities in our study, it is known that patients with PDs, and especially BPD, possess a significantly higher risk for somatic conditions, such as diabetes, hypertension, and osteoarthritis (Frankenburg & Zanarini, 2004). This can lead to multimorbidity, which is associated with polypharmacy (Slabaugh et al., 2010). This emphasizes the importance of monitoring somatic health in patients with PDs.

Older adults from this study population used two psychotropics on average, and were diagnosed with a mean of two comorbid psychiatric diagnoses. However, it is unlikely that psychotropics were prescribed only for these comorbid psychiatric disorders; having a PD seems to be a risk factor for polypharmacy, even more than other psychiatric diagnoses such as depression (Bender et al., 2001). Patients with PDs are more likely to be prescribed anxiolytics, mood stabilizers, antipsychotics, and antidepressants, compared to patients with a major depressive disorder (Bender et al., 2001). This can be related to the wide variety of symptoms being expressed in patients with PDs, which may lead to the prescription of several different psychotropics, e.g., antidepressants for depressed mood or anger, antipsychotics for suspiciousness and anxiety, etc. (American Psychiatric Association, 2001). Consequently, polypharmacy and psychotropic prescriptions can be the result of symptom-based prescribing, rather than the treatment of psychiatric comorbidity.

The anticholinergic burden in our study sample was on an average of 1.1 points, which remains higher compared to community dwelling older adults (mean ARS score 0.7 points) (Jun et al., 2020) or outpatients with dementia (mean ARS score of 0.31 points) (Watanabe et al., 2018). Antidepressants were the most commonly prescribed psychotropics in our study population. Tricyclic antidepressants, such as amitriptyline and nortriptyline, but also antidepressants such as mirtazapine and paroxetine impact the ARS score. Higher ARS scores have been associated with cognitive and physical impairment (Pasina et al., 2013) and anticholinergic adverse effects (such as falls, dry mouth, dizziness, and confusion) (Rudolph et al., 2008) in older adults. Older adults with PDs are therefore at risk for these adverse effects. Regular (at least yearly) medication reviews performed by psychiatrists and clinical pharmacologists should become routine in treating older adults with PDs, to reduce inappropriate polypharmacy, inappropriate prescriptions, and anticholinergic burden.

Based on our findings, there are some indications that the issue of polypharmacy is even more pronounced in older adults with BPD (point prevalence 76.9%) compared to the total study population. Predominantly, the use of somatic medication appears to be higher in older adults with BPD (mean 8.3 prescriptions, *SD 4.3*) compared to the total study population (mean 6.2, *SD 3.6*) resulting in a higher ARS score (mean 1.9 in BPD, compared to 1.1 in the total study population). This is, however, a preliminary finding that has not been tested for statistical significance due to the small size of the investigated population, but it calls for further research.

Strengths and Limitations

This study explores an important and understudied topic. Information on the use of medication in older adults with PDs is much needed. The population in which this study was conducted is very heterogeneous, due to complex comorbidity, which is possibly one of the reasons that these people are often not included in studies. However, it remains the population that visits many psychiatrists, making this study highly clinically relevant. This study's descriptive nature is appropriate to explore the use of medications.

However, this study also has several limitations. Firstly, this study was performed at a tertiary care clinic – which possibly induced some selection bias via selecting older adults with more complex and more severe PDs. This may have resulted in overestimating the prevalence of polypharmacy in older adults with PDs. Secondly, patients with paranoid, schizoid, schizotypal, histrionic or obsessive-compulsive PD had no representation in our sample, which may have decreased the study's external validity. Thirdly, the study was underpowered for detecting statistically significant differences among the various subtypes of PDs, because the groups were unequal in size. While the number of patients with narcissistic, avoidant, and dependent PDs remained small, there was an overrepresentation of PD not otherwise specified, similarly to the frequency observed in younger adult populations (Verheul & Widiger, 2004). In our study, this overrepresentation may also have been caused by the limited applicability of diagnostic tests and criteria to older adults, making them less likely to fulfill the diagnosis of a specific PD (Penders et al., 2020). For this reason, we presented descriptive statistics. Fourthly, we did not take into account possible consequences of polypharmacy, such as side effects or complications, which could have emphasized the importance of reducing polypharmacy. This will be an important focus in our future research.

Reflection on the Case of Mrs. B.

We experienced that the lack of guidelines for the treatment of PDs in older adults, a high level of suffering and help seeking behavior and the presence of a wide variety of symptoms were contributing to suboptimal pharmacotherapy. Mrs. B. was prescribed medication which are considered potentially inappropriate for people aged 65 years and older (TCAs) (Holt et al., 2010; Mann et al., 2023) and without proper indication (e.g., quetiapine for insomnia). However, when the treating psychiatrist and a clinical pharmacist performed a proper medication review, multiple medications (especially those with high anticholinergic burden) were tapered and discontinued, which led to an improvement in the patient's functioning and well-being.

Conclusion, Implications, and Future Directions

We conclude that the prevalence of polypharmacy in older adults with PDs was high due to the high use of both psychotropics and somatic medication. Polypharmacy is associated with adverse outcomes, such as falling, mortality and drug-drug interactions. Conducive to developing guidelines for a safer and more effective treatment, more research is essential. Research should focus more on older adults. The consequences of polypharmacy, such as side effects and complications, should be more appropriately investigated by means of empirical research. Similar research in the future should include larger sample sizes and investigate long-term effects in a prospective design. We think it is also important to include control groups in studies, such as younger to middle-aged adults with PDs and other older adults (e.g., without mental disorders). Treatment guidelines focusing on older adults with PDs should regard polypharmacy as an important risk in pharmacotherapy, and should include approaches to avoid polypharmacy, such as yearly systematical medication reviews.

Author contribution

Julie E. M. SHULKENS: conceptualization, design, methodology, investigation, project administration, data management, formal analysis, interpretation, writing original draft.
Sebastiaan P. J. van ALPHEN: conceptualization, design, methodology, interpretation, supervision, writing review and editing.
Frans R. J. VERHEY: conceptualization, interpretation, supervision, writing review and editing.
Sjacko SOBCZAK: investigation, design, methodology, formal analysis, interpretation, supervision, writing review and editing.

Declaration of interest statement

The authors declare no conflict of interest.

Ethical statement

This manuscript is the authors' original work.
All participants engaged in the research voluntarily and anonymously.
The participants provided their informed consent to participate in this study.
Their data are stored in coded materials and databases without personal data.

Data availability statement

Datasets presented in this article are available from the corresponding author upon reasonable request.

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References

Allende-Alonso, S., Bouza-Herrera, C. N., Rizvi, S. E. H., & Sautto-Vallejo, J. M. (2019). Big data and the central limit theorem: A statistical legend. *Revista Investigación Operacional*, *40*(1), 112–123. https://revistas.uh.cu/invoperacional/article/view/2694

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders: DSM-IV* (4th ed.).

American Psychiatric Association Practice Guidelines. (2001). Practice guideline for the treatment of patients with borderline personality disorder. American Psychiatric Association. *American Journal of Psychiatry*, *158*(10 Suppl), 1–52.

Beers, M. H. (1997). Explicit criteria for determining potentially inappropriate medication use by the elderly. An update. *Archives of Internal Medicine*, *157*(14), 1531–1536.

Bender, D. S., Dolan, R. T., Skodol, A. E., Sanislow, C. A., Dyck, I. R., McGlashan, T. H., Shea, M. T., Zanarini, M. C., Oldham, J. M., & Gunderson, J. G. (2001). Treatment utilization by patients with personality disorders. *American Journal of Psychiatry*, *158*(2), 295–302. https://doi.org/10.1176/appi.ajp.158.2.295

Bourgeois, F. T., Shannon, M. W., Valim, C., & Mandl, K. D. (2010). Adverse drug events in the outpatient setting: An 11-year national analysis. *Pharmacoepidemiol Drug Saf*, *19*(9), 901–910. https://doi.org/10.1002/pds.1984

Charlesworth, C. J., Smit, E., Lee, D. S. H., Alramadhan, F., & Odden, M. C. (2015). Polypharmacy among adults aged 65 years and older in the United States: 1988–2010. *The Journal of Gerontology. Series A, 70*(8), 989–995. https://doi.org/10.1093/gerona/glv013

Dijk, C., Verheij, R. A., & Schellevis, F. G. (2009). Polyfarmacie bij ouderen [Polypharmacy in older adults]. *Huisarts en Wetenschap*, *52,* 315–315. https://doi.org/10.1007/BF03085663

Doan, J., Zakrzewski-Jakubiak, H., Roy, J., Turgeon, J., & Tannenbaum, C. (2013). Prevalence and risk of potential cytochrome P450-mediated drug-drug interactions in older hospitalized patients with polypharmacy. *Annals of Pharmacotherapy*, *47*(3), 324–332. https://doi.org/10.1345/aph.1R621

Fox, C., Smith, T., Maidment, I., Chan, W.-Y., Bua, N., Myint, P. K., Boustani, M., Kwok, C. S., Glover, M., Koopmans, I., & Campbell, N. (2014). Effect of medications with anti-cholinergic properties on cognitive function, delirium, physical function and mortality: A systematic review. *Age and Ageing*, *43*(5), 604–615. https://doi.org/10.1093/ageing/afu096

Frankenburg, F. R., & Zanarini, M. C. (2004). The association between borderline personality disorder and chronic medical illnesses, poor health-related lifestyle choices, and costly forms of health care utilization. *The Journal of Clinical Psychiatry*, *65*(12), 1660–1665. https://doi.org/10.4088/jcp.v65n1211

Fried, T. R., O'Leary, J., Towle, V., Goldstein, M. K., Trentalange, M., & Martin, D. K. (2014). Health outcomes associated with polypharmacy in community-dwelling older adults: A systematic review. *Journal of American Geriatrics Society*, *62*(12), 2261–2272. https://doi.org/10.1111/jgs.13153

Gutiérrez-Valencia, M., Izquierdo, M., Cesari, M., Casas-Herrero, Á., Inzitari, M., & Martínez-Velilla, N. (2018). The relationship between frailty and polypharmacy in older people: A systematic review. *British Journal of Clinical Pharmacology*, *84*(7), 1432–1444. https://doi.org/10.1111/bcp.13590

Holt, S., Schmiedl, S. & Thürmann, P. A. (2010). Potenziell inadäquate Medikation für ältere Menschen: Die PRISCUS-Liste [Potentially inappropriate medications in the elderly. The PRICUS list]. *Deutsches Ärzteblatt International*, *107*(31–32), 543–551. https://doi.org/10.3238/arztebl.2010.0543

Jun, K., Ah, Y. M., Hwang, S., Chung, J. E., & Lee, J. Y. (2020). Prevalence of anticholinergic burden and risk factors amongst the older population: Analysis of insurance claims data of Korean patients. *Internation Journal of Clinical Pharmacy*, *42*(2), 453–461. https://doi.org/10.1007/s11096-020-01010-7

Jyrkkä, J., Enlund, H., Lavikainen, P., Sulkava, R., & Hartikainen, S. (2011). Association of polypharmacy with nutritional status, functional ability and cognitive capacity over a three-year period in an elderly population. *Pharmacoepidemiol Drug Saf*, *20*(5), 514–522. https://doi.org/10.1002/pds.2116

Kann, I. C., Lundqvist, C., & Lurås, H. (2015). Polypharmacy among the elderly in a list-patient system. *Drugs Real World Outcomes*, *2*(3), 193–198. https://doi.org/10.1007/s40801-015-0036-3

Kratz, T., & Diefenbacher, A. (2019). Psychopharmacological treatment in older people: Avoiding drug interactions and polypharmacy. *Deutsches Ärzteblatt International*, *116*, 508–518. https://doi.org/10.3238/arztebl.2019.0508

Lampela, P., Lavikainen, P., Garcia-Horsman, J. A., Bell, J. S., Huupponen, R., & Hartikainen, S. (2013). Anticholinergic drug use, serum anticholinergic activity, and adverse drug events among older people: A population-based study. *Drugs & Aging*, *30*, 321–330. https://doi.org/10.1007/s40266-013-0063-2

Leelakanok, N., Holcombe, A. L., Lund, B. C., Gu, X., & Schweizer, M. L. (2017). Association between polypharmacy and death: A systematic review and meta-analysis. *Journal of the American Pharmacists Association*, *57*(6), 729–738.e10. https://doi.org/10.1016/j.japh.2017.06.002

Lemmens, L. C., & Weda, M. (2015). *Polyfarmacie bij kwetsbare ouderen: Risico's rondom overgangen tussen eerste - en tweedelijnszorg [Polypharmacy in frail elderly: Risks during transition between primary care and secondary care]*. Rijksinstituut voor Volksgezondheid en Milieu. https://www.rivm.nl/bibliotheek/rapporten/2015-0088.pdf

Maggiore, R. J., Gross, C. P., & Hurria, A. (2010). Polypharmacy in older adults with cancer. *The Oncologist*, *15*(5), 507–522. https://doi.org/10.1634/theoncologist.2009-0290

Mann, N. K., Mathes, T., Sönnichsen, A., Pieper, D., Klager, E., Moussa, M., & Thürmann, P. A. (2023). Potentially inadequate medications in the elderly: PRISCUS 2.0. *Deutsches Ärzteblatt International*, *120*, 3–10. https://doi.org/10.3238/arztebl.m2022.0377

Masnoon, N., Shakib, S., Kalisch-Ellett, L., & Caughey, G. E. (2017). What is polypharmacy? A systematic review of definitions. *BMC Geriatrics*, *17*, Article 230. https://doi.org/10.1186/s12877-017-0621-2

Mate, K. E., Kerr, K. P., Pond, D., Williams, E. J., Marley, J., Disler, P., Brodaty, H., & Magin, P. J. (2015). Impact of multiple low-level anticholinergic medications on anticholinergic load of community-dwelling elderly with and without

dementia. *Drugs & Aging*, *32*, 159–167. https://doi.org/10.1007/s40266-014-0230-0

Mojtabai, R., & Olfson, M. (2010). National trends in psychotropic medication polypharmacy in office-based psychiatry. *Archives of Geneneral Psychiatry*, *67*(1), 26–36. https://doi.org/10.1001/archgenpsychiatry.2009.175

Montiel-Luque, A., Núñez-Montenegro, A. J., Martín-Aurioles, E., Canca-Sánchez, J. C., Toro-Toro, M. C., González-Correa, J. A., & the members of Polipresact Research Group. (2017). Medication-related factors associated with health-related quality of life in patients older than 65 years with polypharmacy. *PLoS One*, *12*(2), Article e0171320. https://doi.org/10.1371/journal.pone.0171320

Nishtala, P. S., & Salahudeen, M. S. (2015). Temporal trends in polypharmacy and hyperpolypharmacy in older New Zealanders over a 9-year period: 2005–2013. *Gerontology*, *61*(3), 195–202. https://doi.org/10.1159/000368191

Park, H.-Y., Park, J.-W., Song, H. J., Sohn, H. S., & Kwon, J.-W. (2017). The association between polypharmacy and dementia: A nested case-control study based on a 12-year longitudinal cohort database in South Korea. *PLoS One*, *12*(1), Article e0169463. https://doi.org/10.1371/journal.pone.0169463

Pasina, L., Djade, C. D., Lucca, U., Nobili, A., Tettamanti, M., Franchi, C., Salerno, F., Corrao, S., Marengoni, A., Iorio, A., Marcucci, M., Violi, F., & Mannuci, P. M. (2013). Association of anticholinergic burden with cognitive and functional status in a cohort of hospitalized elderly: Comparison of the anticholinergic cognitive burden scale and anticholinergic risk scale. Results from the REPOSI study. *Drugs & Aging*, *30*, 103–112. https://doi.org/10.1007/s40266-012-0044-x

Penders, K. A. P., Peeters, I. G. P., Metsemakers, J. F. M., & van Alphen, S. P. J. (2020). Personality disorders in older adults: A review of epidemiology, assessment, and treatment. *Current Psychiatry Reports*, *22*, Article 14. https://doi.org/10.1007/s11920-020-1133-x

Rudolph, J. L., Salow, M. J., Angelini, M. C., & McGlinchey, R. E. (2008). The anticholinergic risk scale and anticholinergic adverse effects in older persons. *Archives of Internal Medicine*, *168*(5), 508–513. https://doi.org/10.1001/archinternmed.2007.106

Sarkar, S. (2017). Psychiatric polypharmacy, etiology and potential consequences. *Current Psychopharmacology*, *6*(1), 12–26. https://doi.org/10.2174/2211556005666160916124719

Schulkens, J., Bergs, N., Ingenhoven, T., Rosowsky, E., van Alphen, S., & Sobczak, S. (2021). Selective serotonin reuptake-inhibitors for symptom-based treatment of borderline personality disorders in older adults: An international Delphi study. *Clinical Psychopharmacology and Neuroscience*, *19*(1), 53–62. https://doi.org/10.9758/cpn.2021.19.1.53

Slabaugh, S. L., Maio, V., Templin, M., & Abouzaid, S. (2010). Prevalence and risk of polypharmacy among the elderly in an outpatient setting: A retrospective cohort study in the Emilia-Romagna region, Italy. *Drugs & Aging*, *27*, 1019–1028. https://doi.org/10.2165/11584990-000000000-00000

Spitzer, R. L. (1983). Psychiatric diagnosis: Are clinicians still necessary? *Comprehensive Psychiatry*, *24*(5), 399–411. https://doi.org/10.1016/0010-440x(83)90032-9

Stuhec, M., & Lah, L. (2021). Clinical pharmacist interventions in elderly patients with mental disorders in primary care focused on psychotropics: A retrospective pre-post observational study. *Therapeutic Advences in Psychopharmacology*, *11*. https://doi.org/10.1177/20451253211011007

Taylor, A. W., Price, K., Gill, T. K., Adams, R., Pilkington, R., Carrangis, N., Shi, Z., & Wilson, D. (2010). Multimorbidity - not just an older person's issue. Results from an Australian biomedical study. *BMC Public Health*, *10*, Article 718. https://doi.org/10.1186/1471-2458-10-718

Tian, F., Chen, Z., & Wu, J. (2022). Prevalence of polypharmacy and potentially inappropriate medications use in elderly chinese patients: A systematic review and meta-analysis. *Frontiers in Pharmacology*, *13*, Article 862561. https://doi.org/10.3389/fphar.2022.862561

Tune, L. E. (2001). Anticholinergic effects of medication in elderly patients. *The Journal of Clinical Psychiatry*, *62 Suppl 21*, 11–14. https://pubmed.ncbi.nlm.nih.gov/11584981/

van den Brink, A. M. A., Gerritsen, D. L., de Valk, M. M. H., Oude Voshaar, R. C., & Koopmans, R. T. C. M. (2017). Characteristics and health conditions of a group of nursing home patients with mental-physical multimorbidity - the MAPPING study. *International Psychogeriatrics*, *29*(6), 1037–1047. https://doi.org/10.1017/s1041610217000230

Verheul, R., & Widiger, T. A. (2004). A meta-analysis of the prevalence and usage of the personality disorder not otherwise specified (PDNOS) diagnosis. *Journal of Personality Disorders*, *18*(4), 309–319. https://doi.org/10.1521/pedi.18.4.309.40350

Wastesson, J. W., Fastbom, J., & Johnell, K. (2016). Expanding the proportion of life with polypharmacy in Sweden: 2006–2013. *Journal of the American Medical Directors Association*, *17*(10), 957–958. https://doi.org/10.1016/j.jamda.2016.07.006

Watanabe, S., Fukatsu, T., & Kanemoto, K. (2018). Risk of hospitalization associated with anticholinergic medication for patients with dementia. *Psychogeriatrics*, *18*(1), 57–63. https://doi.org/10.1111/psyg.12291

Zanarini, M. C., Frankenburg, F. R., Hennen, J., & Silk, K. R. (2004). Mental health service utilization by borderline personality disorder patients and Axis II comparison subjects followed prospectively for 6 years. *The Journal of Clinical Psychiatry, 65*(1), 28–36. https://doi.org/10.4088/jcp.v65n0105

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RESEARCH ARTICLE

Factors Associated with Depression Symptoms in the Peruvian Population

Analysis of a National Health Survey

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Introduction: Worldwide, approximately 280 million people suffer from depression, which results from complex interactions.
Aims: Determining the prevalence of depressive symptoms and their associated factors in the Peruvian Population.
Methods: Analytical cross-sectional study. The odds ratios together with their 95% confidence intervals were calculated. For evaluating the strength of association between the variables of interest, a generalized linear model of the Poisson family was performed with robust variance.
Results: The factors associated with exhibiting symptoms of depression were: the female sex; the age group older than 70 years; the year 2021; being married, cohabiting and being separated; residents in the region of Lima, the rest of the coast, mountains and jungle; possessing a level of higher education; living in a rural area; physical disability; drinking alcoholic beverages; having type 2 diabetes mellitus; having hypertension; medium and high fruit consumption.
Conclusions: All the variables evaluated, except for the wealth index, tobacco consumption, health insurance, and body mass index, were associated with depressive symptoms.

Keywords: depressive disorder, adult, risk factors, diabetes mellitus, hypertension

Introduction

Depression is a common disease globally, since at the time of composing this article, approximately 280 million people are estimated to suffer from it (Evans-Lacko et al., 2018). The World Health Organization (WHO) predicts that this disease will be the main cause of worldwide morbidity by 2030 (World Health Assembly 65, 2012). In Latin America, the prevalence of depression stands at approximately 4.9% (Kohn et al., 2005), while in Peru, in 2021, MINSA (National Ministry of Health) reported the care of 313,455 depression cases, evidencing an increase of 12% compared to those treated during 2019 (MINSA, 2022).

Peru presents unique characteristics in prevalence and intervention regarding depression that distinguish it globally. Peru has a history of political violence, particularly during the internal armed conflict in the 1980s and 1990s. The effects of this historical trauma may contribute to a unique form of depression, with individuals experiencing symptoms related to collective trauma and loss (Ruiz Effio, 2020). For instance, recent studies have shown that at least one in ten military personnel in Peru are at risk of suicide, underscoring the need for specific interventions in this group (Valladares-Garrido et al., 2022). Implementing mental health screening technologies in the primary care setting has revealed a high prevalence of unidentified psychological symptoms, indicating the need for more effective and accessible interventions (Diez-Canseco et al., 2018).

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Depression results from complex interactions between social, psychological and biological factors (World Health Organization, 2023), characterized by a depressed mood, loss of interest in previously enjoyed activities plus the inability to carry out activities of daily living for at least two weeks (Pan American Health Organization, n.d.; Martina et al., 2017). During the COVID-19 pandemic, the loss of personal freedoms and control, uncertainty about the immediate future, increased workload, personal concerns, and those of family members or close people were added to the factors previously explained (Huremović, 2019). These additions contributed to an increase in the prevalence of depression up to seven times worldwide (Bueno-Notivol et al., 2021), mainly affecting those who were quarantined alone or whose family or close friends were isolated in some way (Lei et al., 2020). Therefore, the COVID-19 pandemic exacerbated depressive symptoms in several sociodemographic groups, resulting in the necessity of an interventional approach adapted to the specific needs of each population, especially one such as the Peruvian population, which is characterized by socioeconomic challenges including poverty and the presence of vulnerable groups (Zegarra-López et al., 2022).

Approximately 92% of people without treatment continue to experience depressive symptoms (Mekonen et al., 2022) and 75% of affected people in developing countries do not receive any treatment (World Health Organization, 2023); due to this statistics, in a population such as the Peruvian, where an overall prevalence of depressive symptoms stood five times higher during the COVID-19 pandemic than previously reported nationally in 2018 (Antiporta et al., 2021), studying the associated factors, including sociodemographic variables such as sex, age, and economic status (Martina et al., 2017; Molés Julio et al., 2019) is essential to develop more effective and culturally appropriate intervention strategies (Eappen et al., 2018).

It is relevant to analyze the elements related to depressive symptoms in a society such as the Peruvian since these findings could have applicability in other Latin American societies characterized by low income. Furthermore, this would facilitate the identification of the most prominent factors, with the possibility of reducing expenditures aimed at combating depression in highly developed nations.

The present study, therefore, had the objective of determining the prevalence of depressive symptoms and their associated factors in the Peruvian population.

The exploratory research questions were: What is the prevalence of depressive symptoms in the Peruvian population, and what are the factors associated with the manifestation of these symptoms?

Methods

Design and Study Population

In total, 35,419 people were interviewed in 2019; 34,242 in 2020, and 35,847 in 2021. This investigation comprises an integrative summary of a survey encompassing three distinct cross-sectional analytical studies within a unified framework. A secondary analysis of the Demographic and Family Health Survey (ENDES by its acronym in Spanish: Encuesta Demográfica y de Salud Familiar) 2019, 2020, and 2021 was carried out. These are surveys implemented at the national level that consist of a probabilistic, two-stage, stratified, and independent sampling at the departmental level and by urban and rural areas in charge of the National Institute of Statistics and Informatics (INEI by its acronym in Spanish). Every year, this survey is carried out with a large sample of Peruvian residents, always exceeding 30,000 people, so the sample selected in each edition reflects the entire population (ENDES, 2019; INEI, 2019; INEI-Perú, 2021).

In the ENDES survey, there are three questionnaires: 1) household questionnaire, 2) individual woman questionnaire and 3) health questionnaire, the latter collects information on non-communicable diseases including information on mental health.

Variables and measures

The study's dependent variable was the presence of clinically relevant depressive symptoms. According to WHO, depressive disorder encompasses a prolonged period of low mood or a diminished capacity to experience pleasure or interest in activities (World Health Organization, 2023). In the context of this study, we use the term "depressive symptoms" to refer to a range of emotional, cognitive, and physical indicators commonly associated with the clinical state of depression. The presence of these symptoms does not necessarily indicate a clinical diagnosis of depression, but does suggest the need for a more detailed evaluation. We think it is pertinent to note that we use this term ("depressive symptoms") because the ENDES does not directly evaluate depression. Its main focus involves collect-

ing information on various aspects of the population, such as demographics, housing, education, employment and health. For measuring these symptoms, we employed the PHQ-9 questionnaire (Patient Health Questionnaire-9), which is a validated and widely used tool in mental health research with internal consistency (Cronbach's alpha = .90) (Huarcaya-Victoria et al., 2020). This questionnaire is an instrument used for depression screening that has been validated in Peru. The PHQ-9 was validated to reliably compare according to sociodemographic characteristics in the Peruvian population. The PHQ-9 instrument consists of nine questions that assess the presence of depressive symptoms; the responses measure the severity of these symptoms within a range of 0 (never) to 3 (almost every day) with a total score of 0 to 27 points. The score is classified into five categories: minimal (0–4), mild (5–9), moderate (10–14), moderately severe (15–19), and severe (20–27). For this study, two categories were used to classify the dependent variable depending on the presence or absence of clinically relevant depressive symptoms, with the cut point ≥ 4.

The study's independent variables (measured in the same way) were: sex (female vs. male), categorized age (15–35, 36–59, 60–69, and 70 and over), year (2019, 2020, and 2021), marital status (single, married, cohabiting, widowed, divorced, and separated), region of residence (metropolitan Lima, rest of the coast, highlands, and jungle), education (no level, primary, secondary, and higher), wealth index (poorest, medium, rich, and more rich) area of residence (urban vs. rural), physical disability (no vs. yes), smokes daily, drinks alcohol – those who drink alcoholic beverages once or twice per year were categorized in the same way as those who drink alcoholic beverages daily (no vs. yes), health insurance (no vs. yes), Body Mass Index (BMI, underweight – less than 18.49 kg/m^2, normal weight – 18.5–24.9 kg/m^2, overweight – 25–29.9 kg/m^2, and obesity – 30 kg/m^2 or more), type 2 diabetes mellitus (T2DM, no vs. yes), high blood pressure – 140/90 mmHg or more (no vs. yes), and consumption of fruits five times per day or less (divided into tertiles: low, medium, and high).

Statistical Analysis

Data were analyzed using the statistical program STATA v.17 (Stata Corporation, College Station, Texas, USA). For the statistical tests, a statistically significant value of less than .050 ($p < .050$) was considered.

Sociodemographic characteristics were described using absolute frequencies, and the chi-square test was used for the bivariate analysis regarding variations among the variables of interest. Odds ratios along with their 95% confidence intervals (95% CI) were calculated. To evaluate the strength of association between the variables of interest, a generalized linear model of the Poisson family was used with robust variance. The association measure used was the crude prevalence ratio as well as the ratio adjusted for the variables: sex, categorized age, year, region of living, education, wealth index, residence area, physical disability, drinking alcoholic beverages, health insurance, type 2 diabetes mellitus, high blood pressure, and fruit and vegetable consumption.

Results

In total, 105,512 people were surveyed during the previously mentioned three years; the overall prevalence of people with depressive symptoms was 23.2%. Of the total, 51.6%, 51.5%, and 51.7% were found to be females during the survey carried out in the years 2019, 2020, and 2021 respectively. Regarding age, we observed that the majority stood in the range of 15 to 35 years of age, with the respondents from the year 2021 being those who presented the highest percentage with 42.9%. In all the years of surveys included in the present study, a marked difference was found between the number of residents of urban areas and the number of residents of rural areas (Table 1).

Regarding harmful habits, daily smoking and alcohol consumption, each year, the majority of those surveyed stated that they did not have them. In contrast, differences were found in terms of fruit and vegetable consumption depending on the year of the survey. For example, in 2019, 20.5% of people reported having a low consumption of fruits and vegetables, in 2020 this number came to 59.8% and in 2021 the number was 27.7% (Table 1).

After controlling for confounding factors, the factors associated with presenting symptoms of depression were found to be: male (PRa: 0.58; 95% CI 0.56–0.61); the age group older than 70 years (PRa: 1.23; 95% CI 1.12–1.35); surveyed in 2021 (PRa:1.08; 95% CI 1.03–1.13) resident of the rest of the coast (PRa: 0.84; 95% CI 0.80–0.89), highlands (PRa: 1.30; 95% CI 1.23–1.38) and jungle (PRa: 0.89; 95% CI 0.84–0.95); possessing a higher education level (PRa: 0.62; 95% CI 0.46–0.84); living in a rural area (PRa: 0.92; 95% CI 0.87–0.97); if you have a physical disability (PRa: 1.59; IC 95% 1.43–1.77); if you drink alcoholic beverages (PRa: 1.10; 95% CI 1.02–1.19); present T2DM (PRa: 1.35; 95% CI 1.24–1.48); have hypertension (PRa: 1.36; 95% CI 1.28–1.46); and medium (PRa: 0.86; 95% CI 0.82–0.91) and high (PRa: 0.94; 95% CI 0.89–0.99) consumption of fruits (Table 2).

Table 1. Descriptive Analysis of the Characteristics of the Study Population in 2019, 2020, and 2021

Characteristics		Survey year		
		2019	2020	2021
		n (% weighted)	*n* (% weighted)	*n* (% weighted)
Sex	Female	18,268 (51.6)	17,645 (51.5)	18,548 (51.7)
	Male	17,151 (48.4)	16,597 (48.5)	17,299 (48.3)
Age groups	15 to 35 years old	14,975 (42.3)	14,484 (42.3)	15,359 (42.9)
	36 to 59 years old	14,332 (40.5)	13,841 (40.4)	14,359 (40.1)
	60 to 69 years old	3,227 (9.1)	3,132 (9.2)	3,269 (9.1)
	70 years old or more	2,884 (8.1)	2,785 (8.1)	2,858 (8.0)
Marital status	Single	7,825 (22.1)	8,431 (24.6)	7,798 (21.8)
	Married	9,712 (27.4)	8,961 (26.2)	8,486 (23.7)
	Cohabitant	12,232 (34.5)	11,291 (33.0)	12,916 (36.0)
	Widowed	1,835 (5.2)	1,820 (5.3)	2,212 (6.2)
	Divorced	342 (1.0)	291 (0.9)	300 (0.8)
	Separated	3,473 (9.8)	3,446 (10.1)	4,133 (11.5)
Region of living	Metropolitan Lima	13,479 (38.1)	13,017 (38.0)	12,655 (35.3)
	Rest of coast	8,998 (25.4)	8,631 (25.2)	9,626 (26.8)
	Highlands	8,678 (24.5)	8,420 (24.6)	8,851 (24.7)
	Jungle	4,264 (12.0)	4,173 (12.2)	4,714 (13.2)
Education	No level	66 (0.2)	58 (0.2)	60 (0.2)
	Primary	6,939 (20.3)	6,185 (18.6)	6,574 (19.0)
	Secondary	15,367 (45.0)	15,808 (47.6)	16,690 (48.1)
	Superior	11,816 (34.6)	11,169 (33.6)	11,356 (32.8)
Wealth index	Poorest	6,560 (18.5)	6,255 (18.3)	6,792 (19.0)
	Poor	7,516 (21.2)	7,014 (20.5)	7,310 (20.4)
	Medium	7,311 (20.6)	7,274 (21.2)	7,451 (20.8)
	Rich	7,049 (19.9)	6,923 (20.2)	7,180 (20.0)
	Richer	6,982 (19.7)	6,774 (19.8)	7,113 (19.8)
Residence area	Urban	28,603 (80.8)	27,637 (80.7)	28,941 (80.7)
	Rural	6,816 (19.2)	6,605 (19.3)	6,906 (19.3)
Physical disability	Yes	684 (1.9)	1,175 (3.4)	947 (2.6)
Daily smoking	Yes	565 (1.6)	426 (1.2)	432 (1.2)
Drinking alcoholic beverages	Yes	4,613 (13.0)	3,406 (10.0)	3,209 (9.0)
Health Insurance	Yes	25,950 (73.3)	25,814 (75.4)	27,861 (77.7)
Body Mass Index	Underweight	441 (1.3)	1,639 (6.4)	1,326 (3.7)
	Normal weight	12,310 (34.8)	7,867 (30.7)	11,170 (31.2)
	Overweight	14,189 (40.1)	9,744 (38.0)	13,766 (38.4)
	Obese	8,469 (23.9)	6,384 (24.9)	9,577 (26.7)
Type 2 Diabetes mellitus	Yes	1,356 (3.8)	1,518 (4.4)	1,752 (4.9)
High blood pressure	Yes	3,566 (10.1)	3,450 (10.1)	3,498 (9.8)
Fruit and vegetable consumption	Low	7,263 (20.5)	20,469 (59.8)	9,913 (27.7)
	Medium	20,532 (58.0)	10,145 (29.6)	18,655 (52.0)
	High	7,624 (21.5)	3,628 (10.6)	7,279 (20.3)

Source: self made

Table 2. Crude and Adjusted Multivariate Regression Analysis of the Factors Associated with Depression in People Surveyed in 2019, 2020, and 2021

Characteristics*		Symptoms of depression		Crude model PRc (CI 95%)	Adjusted model PRa (CI 95%)
		No	Yes		
		n (%)	*n* (%)		
Sex	Female	42,890 (84.0)	8,159 (16.0)	Ref.	Ref.
	Male	39,428 (72.4)	15,035 (27.6)	1.73 [1.7–1.8]	0.58 [0.6–0.6]
Age groups	15 to 35 years old	36,233 (80.8)	8,586 (19.2)	Ref.	Ref.
	36 to 59 years old	33,444 (78.6)	9,909 (21.4)	1.16 [1.1–1.2]	1.02 [1.0–1.1]
	60 to 69 years old	7,042 (73.1)	2,587 (26.9)	1.40 [1.3–1.5]	1.07 [1.0–1 .1]
	70 years old or more	5,598 (65.6)	2,930 (34.4)	1.79 [1.7–1.9]	1.23 [1.1–1.3]
Year	2019	27,988 (79.0)	7,432 (21.0)	Ref.	Ref.
	2020	26,559 (77.6)	7,684 (22.4)	1.07 [1.0–1.1]	1.05 [1.0–1.1]
	2021	27,770 (77.5)	8,078 (22.5)	1.07 [1.0 –1.1]	1.08 [1.0–1.1]
Marital status	Single	19,078 (79.3)	4,977 (20.7)	Ref.	–
	Married	21,324 (78.5)	5,837 (21.5)	1.04 [1.1–1.1]	–
	Cohabitant	29,631 (81.3)	6,809 (18.7)	0.90 [0.7-0.9]	–
	Widowed	3,717 (63.4)	2,151 (36.7)	1.77 [1.6–1.9]	–
	Divorced	710 (75.9)	225 (24.1)	1.16 [0.9–1.5]	–
	Separated	7,857 (71.1)	3,196 (28.9)	1.40 [1.3–1.5]	–
Region of living	Metropolitan Lima	30,897 (78.9)	8,255 (21.1)	Ref.	Ref.
	Rest of coast	22,181 (81.4)	5,074 (18.6)	0.88 [0.8–0.9]	0.84 [0.8–0.9]
	Highlands	18,629 (71.8)	7,321 (28.2)	1.34 [1.3–1.4]	1.30 [1.2–1.4]
	Jungle	10,609 (80.6)	2,543 (19.3)	0.92 [0.9–1.0]	0.89 [0.8–0.9]
Education	No level	111 (62.9)	68 (37.1)	Ref.	Ref.
	Primary	14,076 (71.5)	5,623 (28.5)	0.77 [0.6–1.0]	0.88 [0.6–1.2]
	Secondary	37,608 (82.9)	10,257 (21.4)	0.58 [0.5–0.7]	0.77 [0.6–1.0]
	Superior	28,475 (82.9)	5,868 (17.1)	0.46 [0.3–0.6]	0.62 [0.5–0.8]
Wealth index	Poorest	14,718 (75.1)	4,890 (24.9)	Ref.	Ref.
	Poor	16,918 (77.5)	4,923 (22.5)	0.90 [0.9–0.9]	1.03 [1.0–1.0]
	Medium	17,187 (78.0)	4,850 (22.0)	0.88 [0.8–0.9]	1.03 [0.9–1.1]
	Rich	16,466 (7.8)	4,687 (22.2)	0.89 [0.8–0.9]	1.07 [1.0–1.2]
	Richer	17,028 (81.6)	3,843 (18.4)	0.74 [0.7–0.8]	0.91 [0.8–1.0]
Residence area	Urban	66,968 (78.6)	18,215 (21.4)	Ref.	Ref.
	Rural	15,350 (75.5)	4,979 (24.5)	0.82 [0.7–0.9]	0.92 [0.9–1.0]
Physical disability	Yes	1,596 (56.9)	1,212 (43.2)	2.01 [1.9–2.2]	1.59 [1.4–1.8]
Daily smoking	Yes	1,143 (80.3)	281 (19.7)	0.90 [0.7–1.01]	–
Drinking alcoholic beverages	Yes	9,131 (81.3)	2,099 (18.7)	0.84 [0.8–0.9]	1.10 [1.0–1.2]
Health Insurance	Yes	20,492 (79.2)	5,392 (20.8)	0.93 [0.9–1.0]	1.04 [1.0–1.1]
Body Mass Index	Underweight	2,646 (77.7)	762 (22.4)	Ref.	–
	Normal weight	24,476 (78.1)	6,873 (21.9)	0.98 [0.9–1.1]	–
	Overweight	29,776 (79.0)	7,926 (21.0)	0.92 [0.8–1.0]	–
	Obesity	18,776 (76.9)	5,655 (23.2)	1.04 [0.2–1.2]	–
T2DM	Yes	2,989 (64.6)	1,639 (35.4)	1.66 [1.5–1.8]	1.35 [1.2–1.5]
High blood pressure	Yes	6,851 (65.2)	3,665 (34.9)	1.70 [1.6–1.8]	1.36 [1.3–1.5]
Fruit and vegetable consumption	Low	28,070 (74.6)	9,577 (35.4)	Ref.	Ref.
	Medium	39,483 (80.0)	9,850 (20.0)	0.78 [0.7–0.8]	0.86 [0.8–0.9]
	High	14,765 (79.7)	3,767 (20.3)	0.80 [0.7–0.8]	0.94 [0.9–1.0]

* Each factor has been independently adjusted for sex, categorized age, year, region of living, education, wealth index, residence area, physical disability, drinking alcoholic beverages, health insurance, type 2 diabetes mellitus, high blood pressure as well as fruit and vegetable consumption.
PR: Prevalence ratio. CI 95%: Confidence interval at 95%
Source: self-made

Discussion

In this study, 23,194 Peruvians with depressive symptoms were found (23.2% of the total). Concerning the sociodemographic variables, we observed that males were more likely to present symptoms of depression. This result is consistent with numerous previously conducted studies supporting a morphologic and pathophysiologic basis for a differential presentation and response by sex (Birur et al., 2017; Calvó-Perxas et al., 2015; Eid et al., 2019; Hernández-Yépez et al., 2022; Kong et al., 2013; Sramek et al., 2016); for example, a study by Kong et al. (2013), demonstrated that sex differences exist in the morphological alterations of the cortico-limbic-striatal system in patients with depression. Finally, in an investigation carried out by Birur et al. (2017), sex differences were found in the peripheral immune system in patients with depression since depressed females, unlike healthy or depressed men, had elevated levels of interleukin (IL)-6 and leptin; in addition, compared to the non-depressed females, men had elevated levels of IL-8, interferon-γ, and leptin, and reduced levels of IL-5.

Regarding the region, we found that residents of the highlands of Peru were more likely to manifest depressive symptoms. In the year 2022, an investigation was conducted on the adult population of Peru utilizing data derived from the Encuesta Nacional de Hogares (ENDES) spanning the years 2018 to 2020. Following a meticulous geospatial analysis, a discernible correlation was observed, indicating a concurrence of depressive disorder across the three years under examination, particularly within the departments of the southern highlands, which concurrently represented regions characterized by pronounced economic depression (Martina Chávez et al., 2022).

In contrast to the results found in this research where males had a greater tendency to depression, the evidence points out that the presence of depressive symptoms in females may be associated with the social and cultural challenges faced by this gender, as was found in a cohort study carried out on child-bearing women, in which depressive symptoms were significantly higher among women who reported gender discrimination compared with women without perceived gender discrimination (Stepanikova et al., 2020).

Regarding age, being 70 years or older was also associated with the presence of depressive symptoms. This result is consistent with that published by Baldeón-Martínez et al. (2019), who observed that being older than 75 was a sociodemographic variable related to depression. Similarly, a study by Martina et al. (2017) based on the ENDES identified that 30% of the Peruvian elderly were 75 years of age or older and that this age range was significantly associated with depression symptoms. Older adults have many comorbidities and have witnessed the loss of several close people, which could explain the frequent depressive manifestations (Baldeón-Martínez et al., 2019).

Furthermore, an association was established between the residence's location and the presence of depressive symptoms, with the inhabitants of rural areas showing the least probability of exhibiting depression; this could be due to a more communal and less stressful lifestyle compared to urban areas. Our results agree with the study conducted by Saltos et al. (2021), where higher levels of depression were recorded in the urban area: people in this area had very high levels of depression, with a prevalence of 48.7%. In contrast, another study revealed that rural residents perceive less social support, experience greater loneliness, and have a less precise and defined purpose in life (Salinas, 2020).

Higher education was found to be associated with depression; however, compared to the study by Liu et al. (2019), whose results indicated an increase in depressive symptoms in proportion to the time of academic training, probably due to the pressure of studying more specialized courses and financial concerns; in this study, the results showed that having a higher education decreased the probability of presenting depressive symptoms.

Having some physical disability proved to be associated with depression. In line with these results is the retrospective cohort study by Luna-Orozco et al. (2020), where the authors revealed that adults with physical limitations compared to those without limitations presented a 68% increased risk for the development of depressive symptoms. Likewise, our article is in agreement with the study by Chao (2014), in which the researchers found that physical disability can contribute to the presence of depression due to the reduction of physical activities and social support.

Another associated factor found was the consumption of alcoholic beverages. Similarly, an investigation carried out in Peruvian male adults revealed that drinking alcohol was a risk factor associated with depression (Estrada-Durand & Salinas-Salas, 2019). Nevertheless, our results differ from those found by Gémes et al. (2019), who argue that those who did not drink alcohol had a higher risk of depression than those who consumed up to seven alcoholic drinks per week. Since alcohol intoxication affects the brain, it is expected that alcohol addiction is associated with numerous mood disorders, among which depression stands out. The consumption of this substance generates biological changes in the brain, such as an increase in protein monocyte chemoattractant-1 and high-

sensitivity C-reactive protein, the same as those observed in men, but not women, with clinical depression (Kelley & Dantzer, 2011).

Furthermore, the presence of T2DM or hypertension were factors associated with depression; these chronic conditions can contribute to psychological stress and have a negative impact on the quality of life, which could exacerbate depressive symptoms. In accordance with this result is the work of the Mexican researchers Galindo-Vázquez et al. (2020), who observed a high presence of depressive symptoms in individuals who manifested one or more medical comorbidities. Similarly, Collazos-Perdomo et al. (2020) found a difference in prevalence between patients with and without hypertension, 17.4% and 12.6% correspondingly; there is probably a bidirectional relationship (Collazos-Perdomo et al., 2020) influenced by the abnormal functioning of the autonomic nervous system in connection with an increased sympathetic activity and poor vagal control in affected individuals (Scalco et al., 2005).

Consuming fruits and vegetables influenced the presence of depressive symptoms; Ocean et al. (2019) uncovered that the effects of increasing the frequency of fruit and/or vegetable consumption on mental well-being were comparable to the effects of many shocking events in life. For example, if an individual who consumed vegetables daily stopped eating them completely, they would thereby suffer a loss of mental stability greater than that of being widowed.

The novel associated factor was referring to the year in which the data had been collected since there was a greater probability of finding people with depression among those surveyed during 2021 than those surveyed during the years 2019 and 2020. This finding may be due to the greater time in quarantine accumulated due to confinement by COVID-19, since it has been shown that spending less time outdoors is associated with severe symptoms of depression (Young et al., 2022). Furthermore, in a study carried out by Lei et al. (2020) research revealed that the prevalence of depression in people affected by COVID-19 was higher than in those who had not been affected.

Strengths and Limitations

It is crucial to point out this work's strengths. First, we employed a nationally representative database, rigorously selecting the study population and subsequent sampling. Furthermore, it is essential to clarify that the ENDES uses mechanisms to avoid the duplication of participants in the different cycles of the survey. In other words, it is doubtful that the same individual has been tested in more than one of these years. This is achieved through a rigorous sampling design and selection procedures intended to ensure that each year's participants are different. Therefore, although we cannot state with absolute certainty that no duplication of participants exists, the methodologies used by ENDES significantly minimize this possibility, allowing us to treat the data as independent sets for each year.

It remains nevertheless also essential to highlight some limitations due to the nature of the study. As this is a cross-sectional study, it is not possible to determine the causal relationships between the variables of interest. In turn, the PHQ-9 instrument only allows the assessment of depressive symptoms within the 14 days prior to the survey.

Conclusion, Implications, and Future Directions

In conclusion, we have identified in this study several factors associated with depressive symptoms among the Peruvian population, including sex, age (70 years or older), survey year, residence in a rural area, educational level, regional residence, physical disability, alcohol consumption, presence of Type 2 Diabetes Mellitus, high blood pressure, higher-than-low fruit consumption, and the year the survey was conducted.

Given our findings, several implications become manifest for the Peruvian mental healthcare system. Firstly, targeted interventions could be developed for individuals in identified high-risk categories, such as those living in rural areas or those over the age of 70. Secondly, the association between higher education and depressive symptoms necessitates further investigation to develop educational interventions that could be integrated into mental health promotion programs. We also recommend that the Peruvian mental healthcare system place a greater emphasis on holistic care, taking into account the interaction between physical health conditions, such as T2DM and high blood pressure, and mental health. This could include integrating mental health services into primary care settings or developing multidisciplinary teams comprising general practitioners, psychologists, and other specialists.

For future research, it would be beneficial to delve deeper into the causative relationships between these associated factors and depressive symptoms, possibly through longitudinal studies or randomized controlled trials. This could further inform targeted interventions and public health policies aimed at reducing the prevalence of depression in Peru.

Author contribution

Gianella Zulema ZEÑAS-TRUJILLO: methodology, investigation, data management, interpretation, writing original draft, writing review and editing.
Víctor Juan VERA-PONCE: conceptualization, design, methodology, funding acquisition, investigation, project administration, data management, formal analysis, supervision, writing review and editing.

Declaration of interest statement

The authors declare no conflict of interest.

Ethical statement

This manuscript is the authors' original work. Human participants have been not involved in this study. This study was based on a secondary analysis of existing public datasets of the ENDES. All data was submitted anonymously, so potential harm to primary study participants was minimal. No ethical approvement, informed consent or data handling policy was needed.

Data availability

This manuscript was based on analyzing existing public domain survey datasets that are freely available online with all identifier information removed. (https://proyectos.inei.gob.pe/microdatos/)

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References

Antiporta, D. A., Cutipé, Y. L., Mendoza, M., Celentano, D. D., Stuart, E. A., & Bruni, A. (2021). Depressive symptoms among Peruvian adult residents amidst a National Lockdown during the COVID-19 pandemic. *BMC Psychiatry*, *21*, Article 111. https://doi.org/10.1186/s12888-021-03107-3

Baldeón-Martínez, P., Luna-Muñoz, C., Mendoza-Cernaqué, S., & Correa-López, L. E. (2019). Depression of the Peruvian elderly adult and associated sociodemographical variables, analysis of ENDES 2017. *Revista de la Facultad de Medicina Humana*, *19*(4), 47–52. https://doi.org/10.25176/RFMH.v19i4.2339

Birur, B., Amrock, E. M., Shelton, R. C., & Li, L. (2017). Sex differences in the peripheral immune system in patients with depression. *Frontiers in Psychiatry*, *8,* Article 108. https://doi.org/10.3389/fpsyt.2017.00108

Bueno-Notivol, J., Gracia-García, P., Olaya, B., Lasheras, I., López-Antón, R., & Santabárbara, J. (2021). Prevalence of depression during the COVID-19 outbreak: A meta-analysis of community-based studies. *International Journal of Clinical and Health Psychology*, *21*(1), Article 100196. https://doi.org/10.1016/j.ijchp.2020.07.007

Calvó-Perxas, L., Garre-Olmo, J., & Vilalta-Franch, J. (2015). Prevalence and sociodemographic correlates of depressive and bipolar disorders in Catalonia (Spain) using DSM-5 criteria. *Journal of Affective Disorders*, *184*, 97–103. https://doi.org/10.1016/j.jad.2015.05.048

Chao, S.-F. (2014). Functional disability and depressive symptoms: Longitudinal effects of activity restriction, perceived stress, and social support. *Aging & Mental Health*, *18*(6), 767–776. https://doi.org/10.1080/13607863.2013.878308

Collazos-Perdomo, D., Ramirez-Ramos, C. F., Torres de Galvis, M. Y., Correas-Orozco, L., Ramirez-Mendez, D., Castilla Agudelo, G. A., Martinez Cano, C. A., Gallego, C., & Saldarriaga, C. (2020). Asociación entre depresión mayor e hipertensión arterial en una población colombiana [Association between major depression and arterial hypertension in a Colombian population]. *Hipertensión y Riesgo Vascular*, *37*(4), 162–168. https://doi.org/10.1016/j.hipert.2020.06.002

Diez-Canseco, F., Toyama, M., Ipince, A., Perez-Leon, S., Cavero, V., Araya, R., & Miranda, J. J. (2018). Integration of a technology-based mental health screening program into routine practices of primary health care services in Peru (The Allillanchu Project): Development and implementation. *Journal of Medical Internet Research*, *20*(3), Article e100. https://doi.org/10.2196/jmir.9208

Eappen, B. S., Aguilar, M., Ramos, K., Contreras, C., Prom, M. C., Scorza, P., Gelaye, B., Rondon, M., Raviola, G., & Galea, J. T. (2018). Preparing to launch the "Thinking Healthy Programme" perinatal depression intervention in Urban Lima, Peru: Experiences from the field. *Global Mental Health*, *5*, Article e41. https://doi.org/10.1017/gmh.2018.32

Eid, R. S., Gobinath, A. R., & Galea, L. A. M. (2019). Sex differences in depression: Insights from clinical and preclinical studies. *Progress in Neurobiology*, *176*, 86–102. https://doi.org/10.1016/j.pneurobio.2019.01.006

Encuesta Nacional Demografía y Salud Familiar (ENDES) 2019, Instituto Nacional de Estadística e Informática—INEI (2019.) *National Open Data Platform*. https://proyectos.inei.gob.pe/microdatos/

Estrada -Durand, P., & Salinas -Salas, C. (2019). Consumo de alcohol como factor asociado a la depresión en estudiantes varones de medicina humana de la universidad Ricardo Palma del año 2018 [Alcohol consumption as a factor associated with depression in students of human medicine of the Ricardo Palma university of the year 2018]. *Revista de la Facultad de Medicina Humana*, *19*(1), Article 13. https://inicib.urp.edu.pe/rfmh/vol19/iss1/13/

Evans-Lacko, S., Aguilar-Gaxiola, S., Al-Hamzawi, A., Alonso, J., Benjet, C., Bruffaerts, R., Chiu, W. T., Florescu, S., de Girolamo, G., Gureje, O., Haro, J. M., He, Y., Hu, C., Karam, E. G., Kawakami, N., Lee, S., Lund, C., Kovess-Masfety, V., Levinson, D., … Thornicroft, G. (2018). Socio-economic variations in the mental health treatment gap for people with anxiety, mood, and substance use disorders: Results from the WHO World Mental Health (WMH) surveys. *Psychological Medicine*, *48*(9), 1560–1571. https://doi.org/10.1017/S0033291717003336

Galindo-Vázquez, O., Ramírez-Orozco, M., Costas-Muñiz, R., Mendoza-Contreras, L. A., Calderillo-Ruíz, G., & Meneses-García, A. (2020). Síntomas de ansiedad, depresión y conductas de autocuidado durante la pandemia de COVID-19 en la población general [Symptoms of anxiety, depression and self-care behaviors during the COVID-19 pandemic in the general population]. *Gaceta Médica de México*, *156*(4), 298–305. https://doi.org/10.24875/GMM.20000266

Gémes, K., Forsell, Y., Janszky, I., László, K. D., Lundin, A., Ponce De Leon, A., Mukamal, K. J., & Moller, J. (2019). Moderate alcohol consumption and depression – a longitudinal population-based study in Sweden. *Acta Psychiatrica Scandinavica*, *139*(6), 526–535. https://doi.org/10.1111/acps.13034

Hernández-Yépez, P. J., Muñoz-Pino, C. O., Ayala-Laurel, V., Contreras-Carmona, P. J., Inga-Berrospi, F., Vera-Ponce, V. J., Failoc-Rojas, V. E., Pereira-Victorio, C. J., & Valladares-Garrido, M. J. (2022). Factors associated with anxiety, depression, and stress in Peruvian university students during the COVID-19 Pandemic. *International Journal of Environmental Research and Public Health*, *19*(21), Article 14591. https://doi.org/10.3390/ijerph192114591

Huarcaya-Victoria, J., De-Lama-Morán, R., Quiros, M., Bazán, J., López, K., Lora, D., Huarcaya-Victoria, J., De-Lama-Morán, R., Quiros, M., Bazán, J., López, K., & Lora, D. (2020). Propiedades psicométricas del Patient Health Questionnaire (PHQ-9) en estudiantes de medicina en Lima, Perú [Psychometric properties of the Patient Health Questionnaire (PHQ-9) in medical students in Lima, Peru]. *Revista de Neuro-Psiquiatría*, *83*(2), 72–78. https://doi.org/10.20453/rnp.v83i2.3749

Huremović, D. (2019). Social distancing, quarantine, and isolation. In D. Huremović (Ed.), *Psychiatry of pandemics: A mental health response to infection outbreak* (pp. 85–94). Springer. https://doi.org/10.1007/978-3-030-15346-5_8

INEI - Perú*: Encuesta Demográfica y de Salud Familiar-ENDES 2021*. (2021). https://www.inei.gob.pe/media/MenuRecursivo/publicaciones_digitales/Est/Lib1838/index.html

Kelley, K. W., & Dantzer, R. (2011). Alcoholism and inflammation: Neuroimmunology of behavioral and mood disorders. *Brain, Behavior, and Immunity*, *25*(Supplement 1), S13–S20. https://doi.org/10.1016/j.bbi.2010.12.013

Kohn, R., Levav, I., de Almeida, J. M. C., Vicente, B., Andrade, L., Caraveo-Anduaga, J. J., Saxena, S., & Saraceno, B. (2005). Los trastornos mentales en América Latina y el Caribe: Asunto prioritario para la salud pública [Mental disorders in Latin America and the Caribbean: A public health priority]. *Revista Panamericana de Salud Pública*, *18*(4-5), 229–240. https://doi.org/10.1590/s1020-49892005000900002

Kong, L., Chen, K., Womer, F., Jiang, W., Luo, X., Driesen, N., Liu, J., Blumberg, H., Tang, Y., Xu, K., & Wang, F. (2013). Sex differences of gray matter morphology in cortico-limbic-striatal neural system in major depressive disorder. *Journal of Psychiatric Research*, *47*(6), 733–739. https://doi.org/10.1016/j.jpsychires.2013.02.003

Lei, L., Huang, X., Zhang, S., Yang, J., Yang, L., & Xu, M. (2020). Comparison of prevalence and associated factors of anxiety and depression among people affected by versus people unaffected by quarantine during the COVID-19 epidemic in southwestern China. *Medical Science Monitor*, *26,* Article e924609. https://doi.org/10.12659/MSM.924609

Liu, X., Ping, S., & Gao, W. (2019). Changes in undergraduate students' psychological well-being as they experience university life. *International Journal of Environmental Research and Public Health*, *16*(16), Article 2864. https://doi.org/10.3390/ijerph16162864

Luna-Orozco, K., Fernández-Niño, J. A., & Astudillo-García, C. I. (2020). Asociación entre la discapacidad física y la incidencia de síntomas depresivos en adultos mayores mexicanos [Association between physical disability and the incidence of depressive symptoms in older Mexican adults]. *Biomédica*, *40*(4), 641–655. https://doi.org/10.7705/biomedica.5398

Martina, M., Ara, M. A., Gutiérrez, C., Nolberto, V., & Piscoya, J. (2017). Depresión y factores asociados en la población peruana adulta mayor según la ENDES 2014-2015 [Depression and associated factors in the older Peruvian population according to the ENDES 2014-2015]. *Anales de la Facultad de Medicina*, *78*(4), 393–397. https://doi.org/10.15381/anales.v78i4.14259

Martina Chávez, M., Amemiya Hoshi, I., Suguimoto Watanabe, S. P., Arroyo Aguilar, R. S., Zeladita Huaman, J. A., Castillo Parra, H., Martina Chávez, M., Amemiya Hoshi, I., Suguimoto Watanabe, S. P., Arroyo Aguilar, R. S., Zeladita Huaman, J. A., & Castillo Parra, H. (2022). Depresión en adultos mayores en el Perú: Distribución geoespacial y factores asociados según ENDES 2018 - 2020 [Depression in older adults in Peru: Geospatial distribution and associated factors according to ENDES 2018 - 2020]. *Anales de la Facultad de Medicina*, *83*(3), 180–187. https://doi.org/10.15381/anales.v83i3.23375

Mekonen, T., Ford, S., Chan, G. C. K., Hides, L., Connor, J. P., & Leung, J. (2022). What is the short-term remission rate for people with untreated depression? A systematic review and meta-analysis. *Journal of Affective Disorders*, *296*, 17–25. https://doi.org/10.1016/j.jad.2021.09.046

MINSA [National Ministry of Health, Peru] (2022, January 13). *Más de 300 mil casos de depresión fueron atendidos durante el 2021 [More than 300 thousand cases of depression were treated during 2021]* [Press release]. https://www.gob.pe/institucion/minsa/noticias/575899-minsa-mas-de-300-mil-casos-de-depresion-fueron-atendidos-durante-el-2021

Molés Julio, M. P., Esteve Clavero, A., Lucas Miralles, M. V., & Folch Ayora, A. (2019). Factors associated with depression in older adults over the age of 75 living in an urban area [Factors associated with depression in people over 75 years of age in urban area]. *Enfermería Global*, *18*(3), 58–82. https://doi.org/10.6018/eglobal.18.3.324401

Ocean, N., Howley, P., & Ensor, J. (2019). Lettuce be happy: A longitudinal UK study on the relationship between fruit and vegetable consumption and well-being. *Social Science & Medicine*, *222*, 335–345. https://doi.org/10.1016/j.socscimed.2018.12.017

Pan American Health Organization. (n.d.) *Depression*. Retrieved February 8, 2024, from https://www.paho.org/en/topics/depression

Ruiz Effio, M. (2020). Violencia política y domesticación de la experiencia traumática en el cuento "En el vientre de la noche", de José de Piérola [Political violence and domestication of the traumatic experience in the story "In the belly of the night", by José Piérola]. *Letras (Lima)*, *91*(134), 241–250. https://doi.org/10.30920/letras.91.134.13

Salinas, A. V. (2020). Depresión en adultos mayores: Prevalencia y factores de riesgo psicosocial en entornos rurales y urbano de la provincia de Misiones, Argentina [Depression in older adults: Prevalence and psychosocial risk factors in rural and urban settings in the province of Misiones, Argentina]. *Apuntes Universitarios, 10*(4), 40–54. https://doi.org/10.17162/au.v10i4.488

Saltos, L. F., Zavala-Calahorrano, A., Ortiz-Villalba, P., Mayorga-Valle, F., & García, M. V. (2021). Estudio comparativo del nivel de depresión de adultos mayores en zonas urbanas y rurales [Comparative study of the level of depression in older adults in urban and rural areas]. *Revista Ibérica de Sistemas e Tecnologias de Informação*, *E42*, 542–553. https://www.proquest.com/openview/081dcd4fed5d458069 95efa834487b99/1?pq-origsite=gscholar&cbl=1006393

Scalco, A. Z., Scalco, M. Z., Azul, J. B. S., & Neto, F. L. (2005). Hypertension and depression. *Clinics*, *60*(3), 241–250. https://doi.org/10.1590/S1807-59322005000300010

Sramek, J. J., Murphy, M. F., & Cutler, N. R. (2016). Sex differences in the psychopharmacological treatment of depression. *Dialogues in Clinical Neuroscience*, *18*(4), 447–457. https://doi.org/10.31887/DCNS.2016.18.4/ncutler

Stepanikova, I., Acharya, S., Abdalla, S., Baker, E., Klanova, J., & Darmstadt, G. L. (2020). Gender discrimination and depressive symptoms among child-bearing women: ELSPAC-CZ cohort study. *EClinicalMedicine*, *20*, Article 100297. https://doi.org/10.1016/j.eclinm.2020.100297

Valladares-Garrido, M. J., Picón-Reátegui, C. K., Zila-Velasque, J. P., Grados-Espinoza, P., Hinostroza-Zarate, C. M., Failoc-Rojas, V. E., & Pereira-Victorio, C. J. (2022). Suicide risk in military personnel during the COVID-19 health emergency in a Peruvian region: A cross-sectional study. *International Journal of Environmental Research and Public Health*, *19*(20), Article 13502. https://doi.org/10.3390/ijerph192013502

World Health Assembly, 65. (2012). *Global burden of mental disorders and the need for a comprehensive, coordinated response from health and social sectors at the country level: Report by the Secretariat*. World Health Organization. https://apps.who.int/iris/handle/10665/78898

World Health Organization. (2023, March 31.) *Depressive disorder (depression)*. https://www.who.int/es/news-room/fact-sheets/detail/depression

Young, D. R., Hong, B. D., Lo, T., Inzhakova, G., Cohen, D. A., & Sidell, M. A. (2022). The longitudinal associations of physical activity, time spent outdoors in nature and symptoms of depression and anxiety during COVID-19 quarantine and social distancing in the United States. *Preventive Medicine*, *154*, Article 106863. https://doi.org/10.1016/j.ypmed.2021.106863

Zegarra-López, A. C., Florentino-Santisteban, B., Flores-Romero, J., Delgado-Tenorio, A., & Cernades-Ames, A. (2022). A cross-sectional study on the prevalence of depressive symptoms and its associated sociodemographic factors in Peru during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, *19*(21), Article 14240. https://doi.org/10.3390/ijerph192114240

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RESEARCH ARTICLE

The Role of Emotion Dysregulation in Problematic Alcohol Use and Coping with Problems

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Introduction: Emotional factors are often specified as playing an important role in the context of problematic alcohol use and alcohol addiction.
Aims: This study focused on examining the relationship between difficulties in emotion regulation, perceived personal problems, and problematic alcohol use.
Methods: 374 participants from the general population in Slovenia and Croatia (34.8% men, 65.2% women) with an average age of 44.28 years (range: 26 to 74 years) completed the Alcohol Use Disorders Identification Test (AUDIT), Individual Problems and Strengths Scale (IPS) and Difficulties in Emotion Regulation Scale – Short Form (DERS-SF).
Results: A higher level of problematic alcohol use positively correlated with difficulties in emotion regulation and the assessment of individual problems ($p \leq .010$). Multiple linear regression analysis demonstrated that higher AUDIT scores were positively associated with two dimensions of difficulties in emotion regulation: impulse control difficulties ($\beta = 0.22$, $p = .008$) and lack of emotional awareness ($\beta = 0.15$, $p = .010$). Difficulties in emotion regulation completely mediated the effect of individual problems on problematic alcohol use (indirect effect: 0.18, CI [–.06, –.31]; $p < .001$): higher levels of individual problems contribute to higher levels of problematic alcohol use through the effect of difficulties in emotion regulation.
Conclusions: The findings indicate the vulnerability of individuals with difficulties in emotion regulation to problematic alcohol use. Difficulties in emotion regulation are an important factor to consider for understanding the development, maintenance, and treatment of alcoholism and problematic alcohol use.

Keywords: emotion regulation, alcoholism, stress, problem-solving, addiction

Introduction

Alcohol is the most common and most widely abused drug in our sociocultural environment and, as such, represents a major public health and social problem. According to the World Health Organisation's (WHO, 2018) estimate, the average global alcohol consumption stands at 6.2 liters of pure alcohol per person per year. Although socially acceptable in many settings, the harmful use of alcohol is a significant issue, with 2.3 billion people worldwide consuming alcoholic beverages. WHO (2024) reports that alcohol consumption is responsible for 7.1%

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and 2.2% of the global burden of disease for men and women, respectively. It contributes to three million deaths annually as well as disabilities and health issues for millions of people. Harmful use of alcohol is responsible for 5.1% of the global burden of disease.

The consequences of harmful alcohol use are multifaceted. They affect the individual (e.g., feeling unwell, health deterioration, problems in relationships and at work, traffic and other accidents), their family (e.g., worsened relationships or violence, mental health problems in children and other loved ones), the wider environment (problems in the workplace, conflict in relationships, misunderstandings, crime) and society (poorer population health, premature deaths, loss of income due to reduced efficiency, increased costs of medical examinations and treatments, costs of police work) (Simonič & Osewska, 2023; Solis et al., 2012; VanGeest et al., 2017).

The use of various psychotropic substances (alcohol, drugs, and medicines) can range from unproblematic social use to abuse and addiction (Straussner, 2004). There is no clear definition available for distinguishing between "use" and "abuse". Each use remains problematic in its own way, as it involves the consumption of an often toxic and psychoactive substance with potentially addictive properties. Substance abuse means the continuous use of substances regardless of whether the individual experiences social, psychological, or physical problems as a result (Ashenberg Straussner, 2011). Repeated harmful use of substances, including alcohol, often leads to an addiction syndrome, which is characterized by specific behavioral, cognitive, and psychological symptoms: a strong need for the substance, difficulties in controlling its use, continued use of the substance despite harmful effects, prioritizing the substance over other commitments and activities, increased tolerance (more and more of the substance for the same effect) and sometimes withdrawal symptoms (WHO, 2007).

Excessive and problematic alcohol use and alcoholism are complex phenomena, and a combination of several factors, differing from individual to individual, contributes to their development. The causes that contribute to problem drinking, alcoholism and its continuance are manifold and include a combination of genetic, biological, psychological, social and environmental factors interacting with each other (Jerebic & Jerebic, 2012). Psychological factors which contribute to the development of alcoholism include certain psychological issues such as anxiety, depression, acute and chronic stress, low self-esteem and problems with managing emotions (Kushner et al., 2000; Schick et al., 2020). Individuals often turn to alcohol as a way to cope with stress, anxiety, depression and other emotional problems.

Excessive consumption of alcohol can temporarily alleviate heavy feelings of stress but can lead to addiction in the long term (Boden & Fergusson, 2011; Hussong et al., 2011; Sinha, 2001). In the context of general processes of coping with stress, the use of substances can be understood as an emotion-focused strategy that is more aimed at reducing emotional distress than at changing stress-causing factors in the environment (Aldwin & Yancura, 2004). It also remains possible that individuals with less effective strategies for coping with stress are more likely to abuse substances to cope with negative emotions (Sudraba et al., 2015). Individuals having low self-esteem or problems with self-regulation (impulse and behavior control) may be more inclined to drink alcohol excessively to improve their mood or to avoid negative feelings (Sher & Rutledge, 2007). Individuals who feel lonely and isolated or have difficulty establishing healthy interpersonal relationships may seek psychological relief from the intoxication achieved by drinking alcohol (Hasking et al., 2011; Moos & Moos, 2006).

Individuals who are prone to negative affectivity (e.g., negative emotions, neuroticism, negative moods, and poor coping strategies) use alcohol more often to cope with their negative moods more easily (Sinha, 2022). They do so to overcome fears, shame, anxiety, and other negative, less tolerable or painful emotions. Individuals thus "self-medicate" with alcohol to reduce discomfort, distress, and especially anxiety, as binge drinking in particular can have anxiolytic and antidepressant effects (Fetzner et al., 2011; Simon et al., 2023). Alcohol also offers a short-term solution to the fear of intimacy, insecurity in relationships and conflicts that the individual cannot resolve alone (Gostečnik et al., 2010). The stupor caused by the consumption of alcohol can thus be understood as a mechanism when a person is unable to face their emotions and, rather than becoming aware of them, understanding them and accepting them, fears or rejects them and thus avoids them instead.

In theories of drinking and alcohol problems, emotional factors are often specified as playing an important or even key role. Many researchers emphasize that emotions and their appropriate regulation are central to human life (Philippot & Feldman, 2004). This is also connected to the problem of drinking and, even more broadly, to the entire phenomenon of substance use. While it is true that not all alcohol use lies exclusively based on emotional motives, the desire to regulate both positive and negative emotions remains an important motivation for its use. In addition to promoting positive emotions, people often use alcohol to overcome negative emotions (Kober

2014; Sher & Gerkin, 2007). Alcohol is thus considered one of the psychoactive substances that can be used to regulate emotions; therefore, drinking alcohol to alleviate one's emotional state can be perceived as an emotion regulation strategy (Ashton et al., 2017; Berking et al., 2011; Dragan, 2015; Jakubczyk et al., 2018; Kelly & Bardo, 2016; Petit et al., 2015; Sayette, 2017).

Emotion regulation is a complex construct for which no single widely accepted and recognised definition or consensus exists regarding its main characteristics (Thompson et al., 2008). In general, it refers to internal processes that allow an individual to maintain emotions to a degree that is still bearable for them (Dermody et al., 2013). Gross (1998) defines this concept as the internal and external processes by which individuals influence what emotions they have, when they have them, and how they experience and express them. Gratz and Roemer (2004) provide a conceptualisation of the fundamental aspects of emotion regulation, which includes: a) awareness and understanding of emotions, b) acceptance of emotions, c) the ability to control impulsive behavior and behave in accordance with desired goals when negative emotions are expected, and d) the ability to use emotion regulation strategies appropriate to the situation flexibly to form emotional responses. According to this multidimensional model, emotion dysregulation – i.e., difficulties in emotion regulation – is associated with the lack of one or more of these abilities.

Emotion dysregulation can be defined as poor awareness, understanding, and acceptance of one's own emotions as well as problems in controlling impulsive behavior and acting in accordance with personal goals when upset (Gratz & Roemer, 2004). The concept of emotion dysregulation forms the basis of many models of psychopathology, as it assumes that individuals with poor emotion regulation skills employ more inappropriate behaviors to regulate their unpleasant emotions (escape or silence them), thereby creating a risk for many other disorders (Tice et al., 2001). Difficulties in emotion regulation therefore contribute to inappropriate coping strategies for stress-related emotions, resulting in unsuccessful self-regulation and impulse control (Tice & Bratslavsky, 2000). It is also more likely that individuals who experience increased emotional stress will attempt to avoid it through activities that promise immediate pleasure (e.g., consuming alcohol and other substances) (Tice et al., 2001). Research confirms that difficulties in emotion regulation are broadly related not only to symptoms of emotional disorders but also to problematic alcohol use and alcohol-related consequences (Berking et al., 2011; Dvorak et al., 2014). Problematic alcohol use serves as an effective but inappropriate emotion regulation strategy, especially in individuals prone to emotion dysregulation (Horvath et al., 2020).

Considering that problematic alcohol use often appears as a regulator of perceived stress and distress and that this is related to emotion dysregulation, in our research, we therefore examined the relationship between perceived individual problems, difficulties in emotion regulation and problematic alcohol use. We were interested in the role of emotion dysregulation in the context of perceived individual problems and problematic alcohol use. We used a multidimensional measure of emotion regulation to investigate the various influences of this construct.

Methods

Participants and Data Collection

374 participants took part in the research. The average age of the participants stood at 44.28 years (*SD* = 11.87; min = 26, max = 74). Sociodemographic characteristics of participants are presented in Table 1.

The research employed a cross-sectional method using a mediation model. The sample population consisted of the general population of Slovenia and Croatia. The inclusion criteria required that the participants be 25 years old or older (we assumed that by the age of 25 individuals have completed the period of adolescence when emotional maturity is also formed and a more stable pattern of emotion regulation has been established) and able to give consent. The research questionnaire was prepared in electronic form via www.1ka, an open source application for online surveys. An invitation to participate in the research with a link to the questionnaire was sent to various addresses and public forums. The ethics of the research were approved by the Medical Ethics Commission of the Republic of Slovenia (No. 0120-7/2021/5) and the management of the clinic for the treatment of alcoholism in Croatia (No. 251-29-11-21-01-7). The survey was conducted from June 2021 to May 2022. Participation in the survey by completing the questionnaire remained voluntary and no formal exclusion criteria existed except for an individual's lack of capacity to give consent or inability to answer the questions. The sampling method in both countries was convenience sampling.

Table 1. Sociodemographic Characteristics of Participants

Baseline characteristic		*n*	%
Gender	Female	244	65.2
	Male	130	34.8
Age	25–30 years old	47	12.7
	31–40 years old	111	29.6
	41–50 years old	110	29.4
	51–60 years old	61	16.4
	61–70 years old	36	9.5
	71+ years old	9	2.4
Employment status	Student	26	7.0
	Unemployed	42	11.3
	Employed	237	63.4
	Retired	53	14.1
	Other (e.g., sick leave, etc.)	16	4.2
Marital status	Single	78	21.1
	Married	164	43.8
	In an intimate relationship (unmarried)	92	24.6
	Divorced	24	6.3
	Widowed	9	2.4
	Did not specify	7	1.8
Problematic alcohol use (AUDIT)	Hazardous and harmful alcohol use	99	26.5
	No hazardous and harmful alcohol use	275	73.5

Note. *n* = number of participants; % = proportion of participants; AUDIT = The Alcohol Use Disorders Identification Test.

Measures

The first part of the research questionnaire collected data on demographic characteristics via questions concerning participants' gender, age, employment status and marital status. This was followed by three psychological questionnaires (AUDIT, IPS, and DERS-SF).

Alcohol Use Disorders Identification Test (AUDIT)

We employed the Alcohol Use Disorders Identification Test (Saunders et al., 1993) to screen for hazardous and harmful alcohol use and to identify current drinking problems (e.g., harmful alcohol use, alcohol abuse, and alcohol addiction). In addition to the general dimension of problematic alcohol use, the test measures three aspects of alcohol abuse: hazardous alcohol use (amount and frequency), symptoms of alcohol addiction (tolerance, ability to control), and problems related to alcohol use. The test consists of 10 questions. Questions 1–8 are evaluated on a 5-point scale and questions 9 and 10 on a 3-point scale. The maximum possible score is 40. Higher scores indicate a greater likelihood of hazardous and harmful alcohol use. A score of 8 or more indicates hazardous or harmful alcohol use as well as the possibility of alcohol addiction (Saunders et al., 1993). Cronbach's α of the AUDIT subscales ranged from .84 to .92 (Cronbach's total score α = .95) and indicated good reliability.

Individual Problems and Strengths Scale (IPS)

The Individual Problems and Strengths Scale is an element of the Systemic Therapy Inventory of Change (STIC) instrument (Pinsof et al., 2009). Researchers employ it to assess an individual's weaknesses and strengths. It contains 22 items divided into areas which assess the state of the subject's weak and strong areas: expression of negative affect (depression, anxiety), lack of inhibition regarding strong impulses (disinhibition), life function-

ing, open expression, (in)flexibility and resilience, self-misunderstanding, substance abuse and self-acceptance. Participants evaluate individual items on a 5-point Likert-type scale (from 1 = not at all/not at all true to 5 = all the time/very true). In our research, we included only the dimension of individual problems, which consists of the following dimensions: expression of negative effects, lack of inhibition regarding strong impulses, (in)flexibility/resilience, misunderstanding of oneself and substance abuse. The higher the results, the more difficulties and problems individuals experience. Cronbach's α of the Individual Problems subscale with 11 items was .68.

Difficulties in Emotion Regulation Scale – Short Form (DERS-SF)

The short form of the Difficulties in Emotion Regulation Scale with 18 items was used to assess different aspects of emotion dysregulation or inappropriate emotion regulation (Kaufman et al., 2016). The original version (Gratz & Roemer, 2004) consists of 36 items. In the shortened version (DERS-SF) (Kaufman et al., 2016), 18 items assess emotional responses in six areas: 1. Non-acceptance of emotional responses, 2. Difficulties engaging in goal-directed behavior, 3. Impulse control difficulties, 4. Lack of emotional awareness, 5. Limited access to emotion regulation strategies, and 6. Lack of emotional clarity. Participants evaluate individual items on a 5-point Likert-type scale (from 1 = almost never to 5 = almost always). A higher score indicates a stronger presence of difficulties in emotion regulation. Cronbach's α of the DERS-SF subscales ranged from .74 to .88 (Cronbach's total score α = .83) and indicated acceptable reliability.

Statistical Analysis

We calculated the results using the IBM SPSS 25 software package. The internal consistency of all scales used was calculated using Cronbach's α coefficient. The data distribution was evaluated both descriptively with the measure of symmetry (skewness) and "tailedness" (kurtosis) as well as with the Shapiro-Wilk statistical test. As the data were not normally distributed, Spearman correlations were calculated between individual problems, emotion dysregulation and alcohol misuse. Multiple linear regression (enter method) was used to assess the simultaneous effects of several independent variables (emotion dysregulation subscales) on alcohol misuse as a dependent variable. The residuals were normally distributed, ensuring the validity of the analysis. Next, we used a mediation model employing bootstrapping, which makes no assumptions about the sampling distribution of the indirect effect (Hayes, 2013). Using the PROCESS macro, analyses were conducted to determine whether emotion dysregulation mediated the relationship between individual problems and alcohol misuse. A nonparametric bootstrap method of 5,000 samples using a confidence interval of 95% was used to test the indirect effect of individual problems on alcohol misuse through the pathway of emotion dysregulation.

Results

Descriptive statistics

The participants achieved an average score of 8.14 (*SD* = 10.45) on the AUDIT scale's total dimension. A total score of 8 or more on this scale indicates hazardous or harmful alcohol use as well as the possibility of alcohol addiction (Saunders et al., 1993). 73.5% of the participants did not display hazardous and harmful alcohol use, while 26.5% did demonstrate hazardous and harmful alcohol use. Alcohol addiction was also recorded in 16.0% of the participants. The average value on the DERS-SF is 37.26 (*SD* = 12.05) and 32.24 (*SD* = 9.42) on the IPS Individual Problems subscale. Table 2 shows descriptive statistics for the entire sample.

Correlations Between Variables

We examined how the level of problematic alcohol use correlates with difficulties in emotion regulation and the level of perceived individual problems.

Table 3 shows the correlations between problematic alcohol use (by subdimensions and for the total score on the AUDIT questionnaire), difficulties in emotion regulation (by subdimensions and for the total score on the DERS-SF questionnaire) and Individual Problems (IPS subscale). All variables are positively and statistically significantly correlated. There is a tendency that the more difficulties individuals have with emotion regulation

Table 2. Descriptive Statistics on the Scales of Problematic Alcohol Use, Problems in Emotion Regulation, and Individual Problems for the Entire Sample

Measure	Variable	Min	Max	*M*	*SD*	*Sk*	*Kt*
AUDIT	Hazardous use	0	12	3.94	3.50	0.82	–0.46
	Symptoms of addiction	0	12	1.48	3.06	2.13	3.39
	Consequences of drinking	0	16	2.77	4.67	1.57	0.94
	AUDIT – TOTAL	0	39	8.14	10.45	1.53	1.03
DERS-SF	Non-acceptance of emotional responses	3	15	6.31	2.96	1.20	1.02
	Difficulties engaging in goal-directed behavior	3	15	7.48	3.06	0.85	–0.07
	Impulse control difficulties	3	14	5.12	2.31	1.29	1.43
	Lack of emotional awareness	3	15	6.75	2.85	0.44	–0.62
	Limited access to emotion regulation strategies	3	15	6.13	2.63	1.13	1.27
	Lack of emotional clarity	3	15	5.80	2.40	0.92	0.83
	DERS - TOTAL	18	76	37.26	12.05	0.89	0.61
IPS	Individual problems	16	63	32.24	9.42	0.80	0.50

Note. AUDIT = The Alcohol Use Disorders Identification Test; IPS = Individual Problems and Strengths Scale; DERS-SF = Difficulties in Emotion Regulation Scale = Short Form; Min = Minimum; Max = Maximum; *M* = Mean; *SD* = Standard deviation; *Sk* = Skewness; *Kt* = Kurtosis.

Table 3. Correlation Coefficients (Spearman's ρ) Between the Level of Individual Problems, Difficulties in Emotion Regulation, and Problematic Use of Alcohol

		AUDIT			
Measure	Variable	Hazardous use	Symptoms of addiction	Consequences of drinking	AUDIT-total
DERS-SF	Non-acceptance of emotional responses	.17**	.22**	.23**	.19**
	Difficulties engaging in goal-directed behavior	.18**	.23**	.22**	.22**
	Impulse control difficulties	.20**	.30**	.26**	.23**
	Lack of emotional awareness	.24**	.23**	.22**	.23**
	Limited access to emotion regulation strategies	.22**	.26**	.27**	.25**
	Lack of emotional clarity	.17**	.23**	.20**	.17**
	DERS - TOTAL	.24**	.31**	.30**	.26**
IPS	Individual Problems	.20**	.26**	.25**	.23**

Notes. DERS-SF = Difficulties in Emotion Regulation Scale = Short Form; IPS - Individual Problems and Strengths Scale; AUDIT = The Alcohol Use Disorders Identification Test; ** = the results are significant if the *p*-value is below .010.

(regarding the overall dimension and on each of the subdimensions); the more hazardous the way they use alcohol (higher quantity and frequency), the more symptoms of addiction (lower tolerance and less ability to control) they display and the more problems and consequences associated with alcohol use (harmful use of alcohol) they experience. A tendency also exists that the more individuals experience singular/specific problems, the higher their level of problematic alcohol use (more hazardous consumption, more symptoms of addiction, and more consequences of drinking). The correlations are low but statistically significant (ranging between $r = .17^{**}$ and $r = .31^{**}$).

Multiple Linear Regression

We were interested in how much of the variance in problematic alcohol use can be explained by individual dimensions of difficulties in emotion regulation, so we conducted a multiple linear regression analysis. Preliminary analyses have shown that all assumptions are correct. The results are presented in Table 4. A significant equation

Table 4. Regression Coefficients for DERS Subscales

Independent variable	B	SE B	β	*t*	*p*	R^2
Non-acceptance of emotional responses	.11	.30	.03	0.37	.713	0.14
Difficulties engaging in goal-directed behavior	.02	.28	.01	0.08	.935	
Impulse control difficulties	.98	.37	.22	2.66	.008	
Lack of emotional awareness	.56	.22	.15	2.58	.010	
Limited access to emotion regulation strategies	.12	.39	.03	0.32	.749	
Lack of emotional clarity	.32	-.33	.07	0.96	.336	

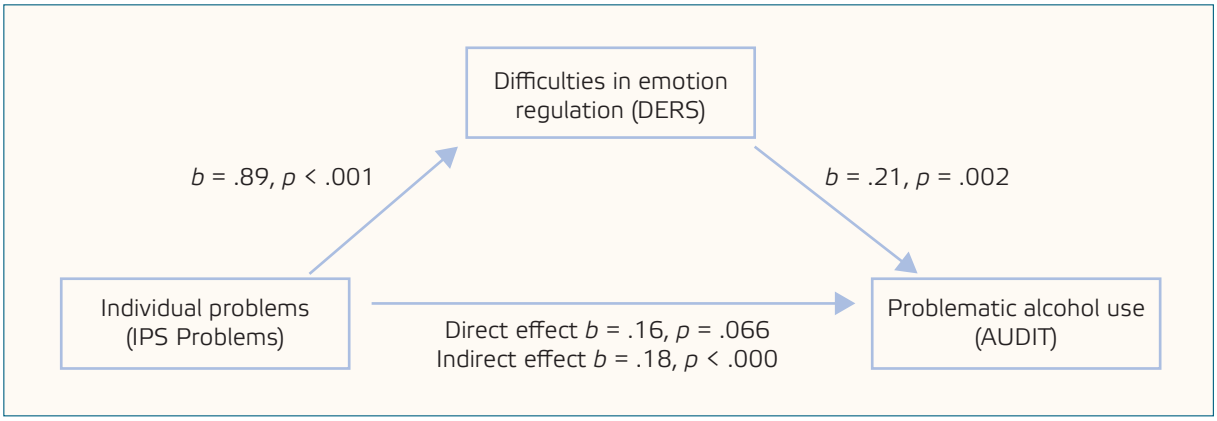
Notes. B = beta value; SE B = standard error for the unstandardized beta; β = standardized beta; *t* = coefficient of the independent variable; *p* = statistical significance; R^2 = coefficient of determination.

was found with the explained total variance of 14%. Impulse control difficulties and lack of emotional awareness indicate significant positive associations with problematic alcohol use.

Mediation Analyses

To examine the relationship between the DERS and the IPS Individual Problems subscale as well as their prediction of scores on the AUDIT, a mediation analysis was performed. From the results shown in Figure 1, we can see that individual problems explain difficulties in emotion regulation, while difficulties in emotion regulation also significantly explain problematic alcohol use. The results show that individual problems bear no direct effect on problematic alcohol use, b = .16, BCa CI [–.01, .32] in the presence of a mediator, while the indirect effect was statistically significant and positive, b = .18, BCa CI [.06, .31]. Accordingly, higher levels of individual problems do not directly contribute to higher levels of problematic alcohol use. The results indicate that difficulties in emotion regulation fully mediate the relationship between individual problems and problematic alcohol use. Higher levels of individual problems were significantly associated with higher levels of problematic alcohol use via emotion dysregulation.

Figure 1. Results of Testing the Model With Difficulties in Emotion Regulation as a Mediator in the Relationship Between Individual Problems and Problematic Alcohol Use



Discussion

This study analyzed the relationship between perceived individual problems, difficulties in emotion regulation, and problematic alcohol use. The main objective was to investigate the role of emotion dysregulation in problematic alcohol use, which may serve as a strategy for regulating individual problems and distress.

The correlation analysis revealed that a higher level of individual problems and difficulties in emotion regulation is correlated with a higher level of problematic alcohol use. Individuals who experience more difficulties in

all dimensions of emotion regulation show more hazardous alcohol use (higher quantity and frequency), more symptoms of addiction (lower tolerance and lower ability to control), and more alcohol-related problems and consequences (harmful use of alcohol). Similarly, higher scores on individual problems correlate with higher levels of problematic drinking.

The correlation between difficulties with emotion regulation and perceived individual problems with alcohol was also researched in other studies, which returned similar results (Dvorak et al., 2014; Tripp & McDevitt-Murphy, 2015). All of them confirm the correlation between these three constructs. It is important to note that these findings are correlational and do not necessarily imply causation (however, according to the results of the regression analysis, a relationship appears to exist in a particular direction, with emotion dysregulation contributing to problematic alcohol use). It has been found that there is a correlation between variables, but it remains unclear whether one variable influences the other or whether a third variable influences both. Despite this, the findings provide insights in at least two directions. On the one hand, these results suggest that perceived individual problems and difficulties in emotion regulation may be the result of problematic alcohol use, as the individual's functionality is reduced. Substance abuse can have a range of negative consequences for individuals and increases the stress associated with the abuse itself (VanGeest et al., 2017). Chronic use of substances triggers changes in the brain, where there are centers or circuits related to stress and emotions as well as their regulation (Murphy et al., 2012). As such, it lowers an individual's ability to regulate perceived stress and negative moods (Thorberg & Lyvers, 2006). These are important dimensions that need to be taken into account when understanding the etiology and treatment of alcoholism (Stellern et al., 2023).

On the other hand, problematic alcohol use may be the result of perceived individual problems and difficulties in emotion regulation. Individuals having more personal problems and thus experiencing higher levels of stress and negative affectivity may seek different strategies for dealing with these challenges. Some of these strategies can be less than functional. The main purpose of stress coping strategies in the face of perceived problems is to regulate unpleasant emotions. It is more likely that individuals who feel increased emotional stress will try to escape it through activities that promise immediate pleasure (Tice et al., 2001), which is made possible by consuming various substances, including alcohol; this is a dysfunctional strategy for coping with stress (Corbin et al., 2013).

In general, research has shown that negative mood and negative affectivity are reliably associated with higher levels of problematic alcohol use (Dora et al., 2023; Martens et al., 2008). While it remains true that not all alcohol use is based exclusively on emotional motives, the desire to regulate both positive and negative emotions serves as an important motivation for its use. In addition to promoting positive emotions, alcohol is often used to regulate negative emotions. Alcohol is thus considered one of the psychoactive substances that can be used to regulate emotions and drinking alcohol to influence the emotional state can be understood as an emotion regulation strategy (Dragan, 2015). Problematic alcohol use may serve as an effective, but inappropriate, emotion regulation strategy, particularly for those prone to emotion dysregulation (Horvath et al., 2020).

To examine whether emotion dysregulation can contribute to problematic alcohol use, we used multiple linear regression analysis to test the magnitude and direction of the effect of the independent variable (difficulties with emotion regulation) on the dependent variable (problematic alcohol use). The results indicate that all dimensions of difficulties with emotion regulation explain 14% of problematic alcohol use. Difficulties with emotion regulation can contribute to problematic alcohol use to some extent. Among the individual dimensions of difficulties with emotion regulation, two explain a higher level of problematic alcohol use: *impulse control difficulties* and *lack of emotional awareness*. Other dimensions of difficulties with emotion regulation did not appear to be predictors of problematic alcohol use in our research.

Adequate emotion regulation is composed of the appropriate abilities to be aware of, understand, and accept emotions, the ability to control impulsive behaviors and behave to achieve set goals when psychological stress increases as well as the ability to use situationally appropriate emotion regulation strategies flexibly to achieve desirable emotional responses (Gratz & Roemer, 2004). If any of these dimensions is missing or is affected, the person has difficulties with emotion regulation and is more likely to resort to problematic alcohol use, which will also serve as an emotion regulation strategy.

Impulse control refers to an individual's ability to inhibit or manage undesirable impulses, tendencies or behavior and to use reason and judgment in decision-making. Difficulties with impulse control manifest in impulsive behavior that is reckless as it is based on a sense of urgency, lack of premeditation, lack of perseverance, and sensation seeking (Karyadi & King, 2011). Individuals with impulse control problems have difficulty maintaining control over impulsive behavior when experiencing negative emotions (Gratz & Roemer, 2004). The more prob-

lems individuals have in this domain, the higher the level of problematic alcohol use. Alcohol use can represent a mode of impulsive behavior where the individual feels the need to react to perceived negative emotional states while failing to establish a coherent and deliberate response to perceived distress (Verdejo-García et al., 2008). These individuals may start drinking recklessly to relieve negative and unpleasant emotions and then continue to drink excessively as a way of self-medicating, which can also lead to alcohol addiction (Karyadi & King, 2011). It makes sense to consider interventions which would simultaneously aim at reducing negative emotions and enable the development of the individual's abilities to inhibit and manage impulses and improve self-control (Shin et al., 2012).

Emotional awareness refers to the tendency to attend to and acknowledge emotions (Gratz & Roemer, 2004). It is a matter of conscious attention to and reflection on the emotional experiences that the individual also experiences on a physical level (Ghafaryan Shirazi et al., 2023). Attention and reflection make it possible to obtain information that is important for further emotional response, as they help a person to conclude what an emotional experience means to them, what they need in this situation, and how to act further. Emotional awareness therefore allows an individual to do something with the emotional information (Lane & Smith, 2021). Problems with emotional awareness are often characterized by the term alexithymia, which refers to problems with recognising and describing emotions. This also includes difficulties in differentiating feelings from physical sensations during emotional arousal (Silani et al., 2008), which often leads to confusion. This is reflected in difficulties with managing emotions (increased emotional reactivity or with calming down when experiencing intense feelings, which affects mental well-being) (Mennin et al., 2007). Solving problems is made more difficult, as a lack of emotional awareness can hinder identification of an appropriate solution and decision-making (Gratz & Roemer, 2004). As emotional confusion therefore increases, further perpetuated by a lack of emotional awareness, alcohol use is more likely to be used as a way to cope with emotions and internal discomfort (Sinha, 2001; Sudraba et al., 2015). When dealing with alcoholism, it is therefore important to emphasize the importance of developing emotional awareness. With interventions that are focused on the awareness and recognition of emotions, it makes sense to teach individuals how to recognise important and useful information when experiencing emotions, in order to achieve adequate responses in certain situations.

Given that problematic alcohol use often occurs in connection with perceived stress, we were interested in whether perceived individual problems, in which the individual also experiences negative emotions, have an impact on problematic alcohol use. Here we found that no direct influence manifests, which means that it is not self-evident that individuals who experience problems also resort to alcohol as a way of regulating perceived stress and negative effects. When we included difficulties with emotion regulation in this model, difficulties with emotion regulation proved to act as a mediator in the relationship between perceived individual problems and problematic alcohol use. Difficulties with emotion regulation therefore partly explain the connection between individual problems and problematic alcohol use. Individuals with more problems may have more difficulty regulating their emotions, which leads to difficulties in dealing with stressful and problematic aspects of life. Stress associated with poor emotion regulation can be reflected in problematic alcohol use. In this case, it remains possible that alcohol, in the absence of other appropriate emotion regulation strategies, can serve as a way of regulating stress and negative affectivity in the face of perceived problems.

These findings provide valuable insights for future research and intervention strategies, challenging common assumptions that perceived individual problems and stress alone lead to problematic alcohol use. The relationship between stress, negative emotions, and alcohol consumption is complex and requires a consideration of multiple factors. Therefore, it is important to understand and address alcohol misuse holistically. Furthermore, identifying difficulties with emotion regulation as a mediator in the relationship between individual problems and problematic alcohol use provides a clearer understanding of the underlying mechanisms. This indicates that developing skills to regulate emotions could be an effective approach for preventing or addressing problematic alcohol use among individuals experiencing various stressors or negative emotions.

These findings also suggest potential avenues for developing interventions. Interventions aimed at improving emotion regulation skills may assist individuals in coping with stress and negative emotions, thereby reducing the likelihood of resorting to alcohol as a maladaptive coping mechanism. Furthermore, these findings highlight the necessity of personalized interventions that take into account individual differences in emotion regulation and address the specific needs of those who are struggling with emotional difficulties and alcohol use. Overall, these findings suggest that there is potential for more nuanced and effective approaches to addressing problematic alcohol use, particularly within the context of perceived individual problems and difficulties with regulating emotions.

Similar conclusions were also reached by Paulus et al. (2016), where negative affectivity did not show a direct impact on alcohol-related outcomes, but was significantly associated with problematic alcohol use and dependence symptoms through emotion dysregulation. Thus, problematic alcohol use may not be a direct result of negative mood, but rather a result of the poor regulation of negative mood. This indicates the vulnerability of individuals having more difficulties with emotion regulation to develop problematic alcohol use and addiction in the face of perceived difficulties. Interventions which promote adequate emotion regulation are thus an important preventive and curative element in the context of problematic alcohol use. Therapeutic approaches for managing emotion dysregulation in the context of problematic alcohol use should involve a comprehensive and integrated strategy. Cognitive behavioral therapy (CBT) and dialectical behavior therapy (DBT) are both effective in targeting maladaptive thoughts and behaviors associated with emotional distress and alcohol misuse and enhancing emotion regulation skills to reduce reliance on alcohol for coping. Mindfulness-based interventions, such as mindfulness-based relapse prevention (MBRP), promote awareness and a non-judgmental acceptance of emotions. Motivational interviewing (MI) helps individuals to explore and resolve ambivalence about change. Family therapy addresses systemic issues, involving support networks in the recovery process. It is important to tailor interventions to individual needs to ensure a holistic approach fostering sustained recovery and emotional well-being.

Strengths and Limitations

Even though the results of this study contribute to understanding the role of emotion regulation difficulties in problematic alcohol use, we think it important to highlight some of its limitations. We based this study on a cross-sectional design, which is useful for obtaining initial information on the relationships between risk factors. However, cross-sectional studies cannot prove a causal relationship between a risk factor and an outcome, as they do not follow participants over time. Additional research, such as cohort (longitudinal) studies or experimental studies, is often needed to establish the causality and dynamics of risk factor-outcome relationships. However, the study offers valuable insights into the relationship among individual problems, difficulties with emotion regulation and problematic alcohol use. While causation cannot be established, identifying significant associations can guide further research and generate hypotheses for future studies.

The research was conducted on a sample of participants from the general population, but the sample was not representative, so the results cannot be generalized to the entire population. In addition, a smaller proportion of men appeared in the research sample, which may affect the results, as some research confirms that differences exist between men and women in the level of problematic alcohol use as well as in emotion regulation. Furthermore, the level of hazardous and harmful alcohol use in the sample stood rather low, so it would make sense to include more participants with hazardous and harmful alcohol use, which could give even clearer results regarding the correlation between difficulties with emotion regulation and problematic alcohol use.

The dimension of individual problems represents a general assessment of an individual's perceived problems but not an assessment of the perceived stress associated with it. Nevertheless, we can conclude based on other research (Pinsof et al., 2009) that its level increases with these dimensions. It would make more sense to assess perceived stress and other symptoms such as depression, anxiety, etc. and to check the predictive value of these dimensions on problematic alcohol use. It would also be important to consider other circumstances such as the possible presence of other substance uses or psychiatric disorders, which were not included in our study. Substance abuse and psychiatric disorders can interact with individual problems, emotion dysregulation, and problematic alcohol use, which may impact the results. For example, this complex interplay of biological, cognitive and social factors creates a cycle in which substance abuse exacerbates psychiatric symptoms and untreated mental health problems hinder efforts to manage alcohol use.

Although the instruments included in the research are often used in this field of research and their validity is well documented, it should be noted that these are self-report instruments. Since self-report instruments focus on how the individual evaluates their characteristics or conditions, it remains important to bear in mind that the answers are subjective and may be subject to some biases. Among these biases is also the desire of individuals to present themselves in the best light, which can affect their answers. The research is cross-sectional and the data were obtained at a specific point in time. This must be taken into account when interpreting the results and deriving practical implications, since here, it is not possible to draw complete conclusions about the nature of the relationship between difficulties with emotion regulation and the problematic use of alcohol.

Conclusion, Implications, and Future Directions

Despite the limitations of this study, which has a cross-sectional design and does not allow for the establishment of a causal relationship between risk factors and outcomes, the results provide valuable insights into the relationship between individual problems, difficulties with emotional regulation, and problematic alcohol use. These findings are significant for future research, as they point to the importance of studying difficulties with emotion regulation for understanding the development, maintenance, and treatment of various disorders, including alcohol addiction and problematic alcohol use. The correlation between perceived problems, negative affectivity, and alcohol use is complex, thus creating a need to assess direct and indirect factors influencing this correlation. The importance of an individual's response to emotional distress is increasingly highlighted. The strategies one uses to regulate one's emotions affect the way one experiences and copes with distress. Based on our results, it can be assumed, at least in part, that people with difficulties regulating psychological distress are more likely to use substances to relieve said distress. Further longitudinal studies are needed, however, to monitor the relationship between these variables at different points in time and in different settings while simultaneously taking other factors into account. The results suggest the importance of emotional dysregulation in problematic alcohol use and point to the importance of research in this area, including qualitative studies. Investigating other external factors that might influence the association between the variables would also be worthwhile. It is important to recognise that there may be a third variable which explains the association between the observed variables. Longitudinal studies which follow variables over time may support causal inferences better and include other factors than those in cross-sectional studies. A cross-sectional study can serve as a starting point for further research, but should never be the sole underlying evidence for a causal relationship.

Persons who have difficulties with emotion regulation are more vulnerable to problematic alcohol use and alcohol-related disorders. In the future, it would make sense for further research to focus even more specifically on which groups or individuals have an increased risk of emotional problems and the occurrence of problematic alcohol use, which aspects of emotion regulation problems are important and which interventions are the most effective in overcoming these problems. It is also important to consider the various areas where emotion (dys) regulation plays an important role. Emotion dysregulation can be understood as a risk factor for problematic alcohol use, as a factor which maintains problematic alcohol use, as a consequence or symptom of problematic alcohol use, as a treatment target and as a mechanism of change. Emotion regulation can become a goal of prevention and a treatment pathway that leads to change.

Reflection is also necessary on the etiology of emotion dysregulation and, as a result, its negative impact on an individual's quality of life. The causes of emotion dysregulation are often intertwined, as it can result from a combination of several factors. In addition to genetic and biological/neurological factors (Phillips et al., 2003), developmental-relational factors may also contribute to emotion dysregulation, such as unsatisfied basic needs in early childhood, lack of emotional support, attunement and empathy from parents, traumatic experiences and chronic stress (Schore, 2001, 2003; Siegel, 2012; Rothschild, 2017). Thus, various interventions aimed at promoting emotion regulation skills (awareness, clarity, understanding of emotions, acceptance of emotions and appropriate response to them) can indirectly contribute to the prevention and reduction of problematic alcohol use. Here, cognitive, behavioral and experiential techniques as well as the mindfulness-based method make sense, as does a deeper psychotherapeutic treatment, which enables an in-depth addressing and processing of the deeper psychodynamics on which dysfunctional emotion regulation is based.

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Author contribution

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Declaration of interest statement
The authors declare no conflict of interest.

Ethical statement
This manuscript is the authors' original work.
All participants engaged in the research voluntarily and anonymously.
Their data are stored in coded materials and databases without personal data.
The studies involving human participants were reviewed and approved by [Commission of the Republic of Slovenia for Medical Ethics, No. 0120-7/2021/5; Clinical Medical Center Sestre Milosrdnice Zagreb, No. 251-29-11-21-01-7].

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Datasets presented in this article are available from the corresponding author upon reasonable request.

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References

Aldwin, C. M., & Yancura, L. A. (2004). Coping. In C. D. Spielberger (Ed.), *Encyclopedia of Applied Psychology* (pp. 507–510). Elsevier. https://doi.org/10.1016/B0-12-657410-3/00126-4

Ashenberg Straussner, S. L. (2011). Children of substance-abusing parents: An overview. In S. L. Ashenberg Straussner & C. Huff Fewell (Eds.), *Children of substance-abusing parents* (pp. 1–27). Springer. https://doi.org/10.1891/9780826165084

Ashton, K., Bellis, M. A., Davies, A. R., Hughes, K., & Winstock, A. (2017). Do emotions related to alcohol consumption differ by alcohol type? An international cross-sectional survey of emotions associated with alcohol consumption and influence on drink choice in different settings. *BMJ Open*, *7*(10), Article e016089. http://dx.doi.org/10.1136/bmjopen-2017-016089

Berking, M., Margraf, M., Ebert, D., Wupperman, P., Hofmann, S. G., & Junghanns, K. (2011). Deficits in emo-

tion-regulation skills predict alcohol use during and after cognitive-behavioral therapy for alcohol dependence. *Journal of Consulting and Clinical Psychology, 79*(3), 307–318. https://doi.org/10.1037/a0023421

Boden, J. M., & Fergusson, D. M. (2011). Alcohol and depression. *Addiction, 106*(5), 906–914. https://doi.org/10.1111/j.1360-0443.2010.03351.x

Corbin, W. R., Farmer, N. M., & Nolen-Hoekesma, S. (2013). Relations among stress, coping strategies, coping motives, alcohol consumption and related problems: A mediated moderation model. *Addictive Behaviors, 38*(4), 1912–1919. https://doi.org/10.1016/j.addbeh.2012.12.005

Dermody, S. S., Cheong, J., & Manuck, S. (2013). An evaluation of the stress-negative affect model in explaining alcohol use: The role of components of negative affect and coping style. *Substance Use & Misuse, 48*(4), 297–308. https://doi.org/10.3109/10826084.2012.761713

Dora, J., Piccirillo, M., Foster, K. T., Arbeau, K., Armeli, S., Auriacombe, M., Bartholow, B., Beltz, A. M., Blumenstock, S. M., Bold, K., Bonar, E. E., Braitman, A., Carpenter, R. W., Creswell, K. G., De Hart, T., Dvorak, R. D., Emery, N., Enkema, M., Fairbairn, C. E., … King, K. M. (2023). The daily association between affect and alcohol use: A meta-analysis of individual participant data. *Psychological Bulletin, 149*(1-2), 1–24. https://doi.org/10.1037/bul0000387

Dragan, M. (2015). Difficulties in emotion regulation and problem drinking in young women: The mediating effect of metacognitions about alcohol use. *Addictive Behaviors, 48*, 30–35. https://doi.org/10.1016/j.addbeh.2015.04.008

Dvorak, R. D., Sargent, E. M., Kilwein, T. M., Stevenson, B. L., Kuvaas, N. J., & Williams, T. J. (2014). Alcohol use and alcohol-related consequences: Associations with emotion regulation difficulties. *American Journal of Drug and Alcohol Abuse, 40*(2), 125–130. https://doi.org/10.3109/00952990.2013.877920

Fetzner, M. G., McMillan, K. A., Sareen, J., & Asmundson, G. J. G. (2011). What is the association between traumatic life events and alcohol abuse/dependence in people with and without PTSD? Findings from a nationally representative sample. *Depression and Anxiety, 28*(8), 632–638. https://doi.org/10.1002/da.20852

Ghafaryan Shirazi, Y., Lindblom, J., Punamäki, R.-L., Yli-Peltola, M., & Peltonen, K. (2023). Emotional awareness and internalizing problems: A preliminary test of state and trait associations among adolescents. *European Journal of Mental Health, 18*, Article e0007. https://doi.org/10.5708/EJMH.18.2023.0007

Gostečnik, C., Repič, T., Cvetek, M., & Cvetek, R. (2010). Hidden mission of the psyche in abuse and addiction. *Journal of Religion and Health, 49*, 361–376. https://psycnet.apa.org/doi/10.1007/s10943-009-9264-8

Gratz, K. L., & Roemer, E. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment*, *26*, 41–54. https://psycnet.apa.org/doi/10.1023/B:JOBA.0000007455.08539.94

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*(3), 271–299. https://psycnet.apa.org/doi/10.1037/1089-2680.2.3.271

Hasking, P., Lyvers, M., & Carlopio, C. (2011). The relationship between coping strategies, alcohol expectancies, drinking motives and drinking behaviour. *Addictive Behaviors, 36*(5), 479–487. https://doi.org/10.1016/j.addbeh.2011.01.014

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach.* The Guilford Press

Horvath, S. A., Shorey, R. C., & Racine, S. E. (2020). Emotion dysregulation as a correlate of food and alcohol disturbance in undergraduate students. *Eating Behaviors, 38*, Article 101409. https://doi.org/10.1016/j.eatbeh.2020.101409

Hussong, A. M., Jones, D. J., Stein, G. L., Baucom, D. H., & Boeding, S. (2011). An internalizing pathway to alcohol use and disorder. *Psychology of Addictive Behaviors, 25*(3), 390–404. https://doi.org/10.1037/a0024519

Jakubczyk, A., Trucco, E. M., Kopera, M., Kobyliński, P., Suszek, H., Fudalej, S., Brower, K. J., & Wojnar, M. (2018). The association between impulsivity, emotion regulation, and symptoms of alcohol use disorder. *Journal of Substance Abuse Treatment, 91*, 49–56. https://doi.org/10.1016/j.jsat.2018.05.004

Jerebic, D., & Jerebic, S. (2012). Različni modeli zdravljenja odvisnosti in relacijska družinska terapija [Various models of addiction treatment and relational family therapy]. *Bogoslovni vestnik, 72*(2), 297–309. http://www.teof.uni-lj.si/uploads/File/BV/BV-72-2-Jerebic.pdf

Karyadi, K. A., & King, K. M. (2011). Urgency and negative emotions: Evidence for moderation on negative alcohol consequences. *Personality and Individual Differences, 51*(5), 635–640. https://psycnet.apa.org/doi/10.1016/j.paid.2011.05.030

Kaufman, E. A., Xia, M., Fosco, G., Yaptangco, M., Skidmore, C. R., & Crowell, S. E. (2016). The difficulties in emotion regulation scale short form (DERS-SF): Validation and replication in adolescent and adult samples. *Journal of Psychopathology and Behavioral Assessment, 38*, 443–455. https://psycnet.apa.org/doi/10.1007/s10862-015-9529-3

Kelly, T. H., & Bardo, M. T. (2016). Emotion regulation and drug abuse: Implications for prevention and treatment. *Drug and Alcohol Dependence, 163*(Suppl 1), S1–S2. https://doi.org/10.1016/j.drugalcdep.2016.02.038

Kober, H. (2014). Emotion regulation in substance use disorders. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 428–446). The Guilford Press.

Kushner, M. G., Abrams, K., & Borchardt, C. (2000). The relationship between anxiety disorders and alcohol use disorders: A review of major perspectives and findings. *Clinical Psychology Review, 20*(2), 149–171. https://doi.org/10.1016/S0272-7358(99)00027-6

Lane, R. D., & Smith, R. (2021). Levels of emotional awareness: Theory and measurement of a socio-emotional skill. *Journal of Intelligence, 9*(3), Article 42. https://doi.org/10.3390%2Fjintelligence9030042

Martens, M. P., Neighbors, C., Lewis, M. A., Lee, C. M., Oster-Aaland, L., & Larimer, M. E. (2008). The roles of negative affect and coping motives in the relationship between alcohol use and alcohol-related problems among college students. *Journal of Studies on Alcohol and Drugs, 69*(3), 412–419. https://doi.org/10.15288/jsad.2008.69.412

Mennin, D. S., Holaway, R. M., Fresco, D. M., Moore, M. T., & Heimberg, R. G. (2007). Delineating components of emotion and its dysregulation in anxiety and mood psychopathology. *Behavior Therapy, 38*(3), 284–302. https://doi.org/10.1016/j.beth.2006.09.001

Moos, R. H., & Moos, B. S. (2006). Participation in treatment and Alcoholics Anonymous: A 16-year follow-up of initially untreated individuals. *Journal of Clinical Psychology, 62*(6), 735–750. https://doi.org/10.1002%2Fjclp.20259

Murphy, A., Taylor, E., & Elliott, R. (2012). The detrimental effects of emotional process dysregulation on decision-making in substance dependence. *Frontiers in Integrative Neuroscience, 6,* Article 101. https://doi.org/10.3389/fnint.2012.00101

Paulus, D. J., Bakhshaie, J., Lemaire, C., Garza, M., Ochoa-Perez, M., Valdivieso, J., Velasco, R. V., Bogiaizian, D., Kauffman, B. Y., Robles, Z., Neighbors, C., & Zvolensky, M. J. (2016). Negative affectivity and problematic alcohol use among Latinos in primary care: The role of emotion dysregulation. *Journal of Dual Diagnosis, 12*(2), 137–147. https://doi.org/10.1080/15504263.2016.1172897

Petit, G., Luminet, O., Maurage, F., Tecco, J., Lechantre, S., Ferauge, M., Gross, J. J., & de Timary, P. (2015). Emotion regulation in alcohol dependence. *Alcoholism – Clinical & Experimental Research, 39*(12), 2471–2479. https://doi.org/10.1111/acer.12914

Philippot, P., & Feldman, R. S. (Eds.). (2004). *The regulation of emotion.* Psychology Press.

Phillips, M. L., Drevets, W. C., Rauch, S. L., & Lane, R. (2003). Neurobiology of emotion perception II: Implications for major psychiatric disorders. *Biological Psychiatry, 54*(5), 515–528. https://doi.org/10.1016/s0006-3223(03)00171-9

Pinsof, W. M., Zinbarg, R. E., Lebow, J. L., Knobloch-Fedders, L. M., Durbin, E., Chambers, A., Latta, T., Karam, E., Goldsmith, J., & Friedman, G. (2009). Laying the foundation for progress research in family, couple, and individual therapy: The development and psychometric features of the initial systemic therapy inventory of change. *Psychotherapy Research, 19*(2), 143–156. https://doi.org/10.1080/10503300802669973

Rothschild, B. (2017). *The body remembers Volume 2: Revolutionizing trauma treatment*. W. W. Norton & Company.

Saunders, J. B., Aasland, O. G., Babor, T. F., de la Fuente, J. R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption-II. *Addiction, 88*(6), 791–804. https://doi.org/10.1111/j.1360-0443.1993.tb02093.x

Sayette, M. A. (2017). The effects of alcohol on emotion in social drinkers. *Behaviour Research and Therapy, 88*, 76–89. https://doi.org/10.1016%2Fj.brat.2016.06.005

Schick, M. R., Nalven, T., & Spillane, N. S. (2020). The factor structure of self-esteem and its association with alcohol use in American Indian (AI) adolescents. *American Journal of Orthopsychiatry, 90*(6), 712–719. https://doi.org/10.1037/ort0000504

Schore, A. N. (2001). The effects of early relational trauma on right brain development, affect regulation, and infant mental health. *Infant Mental Health Journal, 22*(1-2), 201–269. https://doi.org/10.1002/1097-0355(200101/04)22:1%3c201::AID-IMHJ8%3e3.0.CO;2-9

Schore, A. N. (2003). *Affect regulation and the repair of the self.* W. W. Norton.

Sher, K. J., & Gerkin, E. R. (2007). Alcohol and affect regulation. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 560–580). The Guilford Press.

Sher, K. J., & Rutledge, P. C. (2007). Heavy drinking across the transition to college: Predicting first-semester heavy drinking from precollege variables. *Addictive Behaviors, 32*(4), 819–835. https://doi.org/10.1016%2Fj.addbeh.2006.06.024

Shin, S. H., Hong, H. G., & Jeon, S.-M. (2012). Personality and alcohol use: The role of impulsivity. *Addictive Behaviors, 37*(1), 102–107. https://doi.org/10.1016/j.addbeh.2011.09.006

Siegel, D. J. (2012). *The developing mind: How relationships and the brain interact to shape who we are* (2nd ed.). The Guilford Press.

Silani, G., Bird, G., Brindley, R., Singer, T., Frith, C., & Frith, U. (2008). Levels of emotional awareness and autism: An fMRI study. *Social Neuroscience, 3*(2), 97–112. https://doi.org/10.1080/17470910701577020

Simon, B., Thury, A. Á., Török, L., Földesi, I., Csabafi, K., & Bagosi, Z. (2023). The effects of alcohol on anxiety-like, depression-like, and social behavior immediately and a day after binge drinking. *Alcohol, 112*, 17–24. https://doi.org/10.1016/j.alcohol.2023.05.004

Simonič, B., & Osewska, E. (2023). Emotional experience and consequences of growing up in a family with alcoholism in adult children of alcoholics. *The Person and the Challenges, 13*(1), 63–81. https://doi.org/10.15633/pch.13105

Sinha, R. (2001). How does stress increase risk of drug abuse and relapse? *Psychopharmacology, 158*, 343–359. https://doi.org/10.1007/s002130100917

Sinha, R. (2022). Alcohol's negative emotional side: The role of stress neurobiology in alcohol use disorder. *Alcohol Research: Current Reviews, 42*(1), Article 12. https://doi.org/10.35946/arcr.v42.1.12

Solis, J. M., Shadur, J. M., Burns, A. R., & Hussong, A. M. (2012). Understanding the diverse needs of children whose parents abuse substances. *Current Drug Abuse Reviews, 5*(2), 135–147. https://doi.org/10.2174%2F1874473711205020135

Stellern, J., Xiao, K. B., Grennell, E., Sanches, M., Gowin, J. L., & Sloan, M. E. (2023). Emotion regulation in substance use disorders: A systematic review and meta-analysis. *Addiction, 118*(1), 30–47. https://doi.org/10.1111/add.16001

Straussner, S. L. A. (2004). Assessment and treatment of clients with substance use disorders: An overview. In S. L. A. Straussner (Ed.), *Clinical work with substance-abusing clients* (3rd ed., pp. 3–38). The Guilford Press.

Sudraba, V., Millere, A., Deklava, L., Millere, E., Zumente, Z., Circenis, K., & Millere, I. (2015). Stress coping strategies of drug and alcohol addicted patients in Latvia. *Procedia - Social and Behavioral Sciences, 205,* 632–636. https://doi.org/10.1016/j.sbspro.2015.09.099

Thompson, R. A., Lewis, M. D., & Calkins, S. D. (2008). Reassessing emotion regulation. *Child Development Perspectives, 2*(3), 124–131. https://doi.org/10.1111/j.1750-8606.2008.00054.x

Thorberg, F. A., & Lyvers, M. (2006). Negative Mood Regulation (NMR) expectancies, mood, and affect intensity among clients in substance disorder treatment facilities. *Addictive Behaviors, 31*(5), 811–820. https://doi.org/10.1016/j.addbeh.2005.06.008

Tice, D. M., & Bratslavsky, E. (2000). Giving in to feel good: The place of emotion regulation in the context of general self-control. *Psychological Inquiry, 11*(3), 149–159. https://doi.org/10.1207/S15327965PLI1103_03

Tice, D. M., Bratslavsky, E., & Baumeister, R. F. (2001). Emotional distress regulation takes precedence over impulse control: If you feel bad, do it! *Journal of Personality and Social Psychology, 80*(1), 53–67. https://doi.org/10.1037/0022-3514.80.1.53

Tripp, J. C., & McDevitt-Murphy, M. E. (2015). Emotion dysregulation facets as mediators of the relationship between PTSD and alcohol misuse. *Addictive Behaviors, 47*, 55–60. https://doi.org/10.1016/j.addbeh.2015.03.013

VanGeest, J. B., Johnson, T. P., & Alemagno, S. A. (2017). History of substance abuse research in the United States. In J. B. VanGeest, T. P. Johnson, & S. A. Alemagno (Eds.), *Research methods in the study of substance abuse* (pp. 3–25). Springer. http://dx.doi.org/10.1007/978-3-319-55980-3_1

Verdejo-Garcia, A., Lawrence, A. J., & Clark, L. (2008). Impulsivity as a vulnerability marker for substance-use disorders: Review of findings from high-risk research, problem gamblers and genetic association studies. *Neuroscience and Biobehavioral Reviews, 32*(4), 777–810. https://doi.org/10.1016/j.neubiorev.2007.11.003

World Health Organization. (2007). *International Classification of Diseases 11th Revision.* https://icd.who.int/en

World Health Organization. (2018). *Global status report on alcohol and health 2018.* https://www.who.int/publications/i/item/9789241565639

World Health Organization. (2024, January 30). Alcohol. https://www.who.int/health-topics/alcohol#tab=tab_1

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RESEARCH ARTICLE

The Role of Social Comparison and Online Social Support in Social Media Addiction Mediated by Self-Esteem and Loneliness

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Introduction: The diversity of information on social media provides a ubiquitous possibility for social comparison. Online social comparisons have both detrimental and beneficial effects; besides lowering one's self-esteem, heightening loneliness and addiction, they also bring together people with similar interests which may offer a form of social support.
Aims: This study examines a path model for understanding the link between social comparison and social media addiction while examining online social support, loneliness, and self-esteem.
Methods: Hungarian university students (N = 201, 70.6% women, aged between 18 and 30 years, SD = 2.77) completed an online survey in the spring of 2022.
Results: The final path model suggests that social comparison can directly contribute to social media addiction. This link was mediated by loneliness and self-esteem, resulting in a path with different outcomes: a) social comparison may strengthen loneliness (β = .22, p < .001) which can lead to lower self-esteem (β = .60, p < .001), and b) social comparison may have a negative effect on self-esteem (β = -.22, p < .001) which can reduce social media addiction (β = -.26, p < .001). In addition, social comparison may help obtain online social support (β = .15, p < .050) which can reduce loneliness (β = -.41, p < .001) but increase the likelihood of addiction (β = .26, p < .001).
Conclusions: These findings draw attention to the double-edged sword of social comparison and online social support: we need to learn to consciously manage online social comparison tendencies.

Keywords: social comparison, online social support, social media addiction, loneliness, self-esteem

Introduction

Social media includes various internet-based websites, services, and related tools that provide space for socializing, entertaining, and sharing content. Social networking sites are widely accessible and can help individuals with maintaining existing social connections or creating new ones, reading messages and comments, disclosing personal information, and seeking social support (Boyd & Ellison, 2007; Winstone et al., 2021). Social media has become one of the most essential platforms in our everyday life (Cheng et al., 2021). For university students, it provides important sources of information in terms of managing their studies (sharing school-related experiences, searching for notes and books). The most articulated reason for using it, however, is to communicate with other

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people (Koo et al., 2015). Interestingly, people tend to be more sociable online than in face-to-face settings, partly due to differences in interacting styles, types of feedback, or cue systems (Mantzouranis et al., 2019). Among others, social comparison plays a decisive role in forming our attitudes and behavior in a virtual environment, which constitutes this study's primary focus. More precisely, we are interested in the link between social comparison and social media addiction, also including a beneficial online activity; namely, online social support, together with other psychological variables in a complex path model.

Social comparison theory, a concept initially proposed by Festinger (1954), states that individuals evaluate their own opinions and abilities by comparing themselves to others. While using upward social comparison, we compare ourselves to those we perceive as superior since they are above us in terms of physical attractiveness or abilities, downward comparison acts in the opposite way; whether these two serve as a self-enhancement or not is related to the similarity or contrast relative to others (Suls et al., 2002).

Comparing ourselves to others remains a fundamental social need, and on social networking sites, the diversity of information provides a ubiquitous possibility for social comparison. Social media provides a context for social comparison processes while viewing a number of profiles or contents which may lead to dissatisfaction, particularly generating a great exposure to upward social comparison (Haferkamp & Krämer, 2011). This form of social comparison can lead to worsening psychological well-being, lower self-esteem, and even an increase in the reporting of depressive symptoms (Appel et al., 2016; Burnell et al., 2019; Hawes et al., 2020; Vogel et al., 2014). Unfortunately, due to the nature of social media, users of these sites tend to be more prone to upward rather than downward social comparison since many people use these platforms to present positive self-image, life events, and success stories – often showing off some slightly improved version (Xiaojun et al., 2019). In the case of receiving favorable responses, the level of self-worth would be expected to rise, but this scenario does not apply across the board and can result in conflicting ideas that may lead to lower self-esteem and well-being, anxiety, or even depression (Alsunni & Latif, 2021; Samra et al., 2022; Wang et al., 2017). Consequently, depending on the users' personality and their actual psychological well-being, social comparison can either help self-enhancement or increase the likelihood of negative mental health consequences.

Among the different online activities, social networking sites are the most addictive platforms (Baccarella et al., 2018). Although social media addiction (or problematic social media use) is not officially listed and defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM−5, American Psychiatric Association, 2013), the guidelines foreshadow that this phenomenon has become a well-known concept in the general well-being literature (Pellegrino et al., 2022; Sun & Zhang, 2021). A person becomes overly engaged with social media and cannot control the urge to log on to or use social media. This behavior interferes with other important areas of life, such as neglecting social relationships or deteriorating academic performance (Kitsantas et al., 2016). When normal use develops into a problematic behavior, it may bring unfavorable health consequences including depressive symptoms (Vidal et al., 2020), worsening physical fitness (Shimoga et al., 2019), disordered eating (Wilksch et al., 2020), increased suicide risk (Sedgwick et al., 2019), and anxiety (Vannucci et al., 2017). Despite the expansive research reporting on social media addiction, further clarification is warranted on the direct and indirect roles of social comparison and other potential mediators, such as loneliness, self-esteem, or social support.

Despite contradictory experiences, social comparison processes may directly or indirectly be related to social media addiction (Kim et al., 2021). In this study, social media addiction was highly positively correlated with overall social comparison tendencies and also with all dimensions of social comparison including inspiration but also envy or anger. All these suggest that social comparison as a background variable of social media addiction should get more attention in research.

Not surprisingly, loneliness stands as one of the most important reasons for individuals to spend time on social network sites where they can easily interact with friends or strangers (Caba Machado et al., 2023; Mahapatra, 2019). Social media meets the human need for belongingness and prevents social isolation through positive self-disclosure (Park et al., 2016). Besides the feeling of social connectedness, it can also be beneficial in terms of obtaining social support (Savci et al., 2022). However, the need for belongingness does not necessarily lead to a greater level of perceived social support (Wong et al., 2019). We therefore need to know more about the positive and negative aspects of online communication, social interactions, social support, and their relationships with social media activities and any related media addiction.

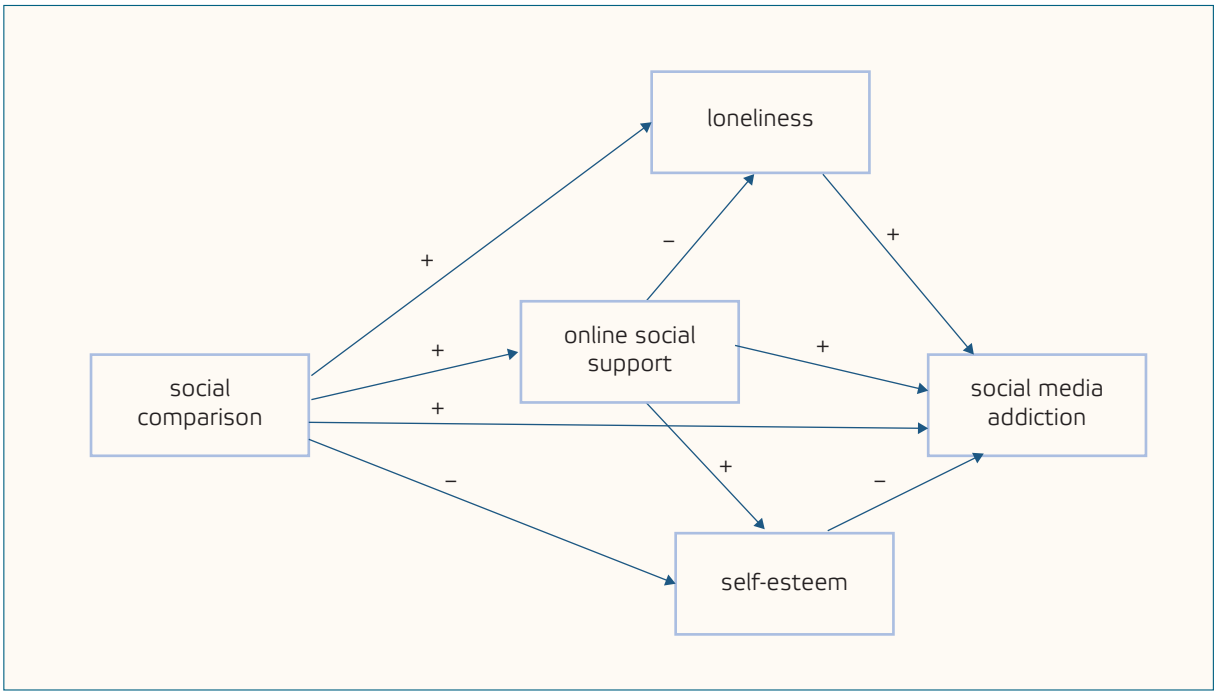
Besides loneliness, self-esteem is also a relevant psychological construct regarding the use of social networking sites and social media addiction. As a subjective perception of one's overall personal worth (Rosenberg, 1979), it has a great influence on behavioral decisions. Studies usually find a negative relationship between self-esteem and

the addictive use of social media (Andreassen et al., 2017). On the other hand, social networking sites seem a safer place for people with low levels of self-esteem to present themselves as compared to the offline world. Besides, self-esteem bears a direct link to well-being; social comparison and social support also play a role in whether the outcome is favorable or not (Wang et al., 2017).

Among predictors of social media addiction, researchers emphasize social support factors (Wang & Wang, 2013). While offline social support is often found to be a protective factor insulating individuals against internet and social media addiction (van Duin et al., 2021), the results of online social support are contradictory. At one level, online social interactions tend to be positively associated with prosocial behavior that may promote voluntary activities, such as guiding and helping (Li et al., 2022). It may serve as a form of social capital, a resource of useful information, and emotional or instrumental support, even when stemming from weak ties (Maksl & Young, 2013). A great advantage is that social media can bring people together into specific groups with similar interests, thereby providing support to members when needed (Eastin & LaRose, 2005). At a much different level, online social support can contribute to internet and social media addiction (Luchtefeld & Jordan, 2022; van Duin et al., 2021). As the relationship between online social support and the latter one remains only scarcely studied, we believe that it warrants a closer inspection.

The present study builds on the above-mentioned work and explores the roles of social comparison and online social support in social media addiction. While the majority of studies concentrate on these separately, the interrelationship among them and the joint common role in social media addiction is not entirely clear. In addition, as previous studies suggest, we consider other relevant factors including self-esteem and loneliness. More precisely, we examine a path model for social comparison and social media addiction with online social support, loneliness, and self-esteem (see Figure 1 for the hypothesized model). Besides a direct positive link between social comparison and social media addiction, and loneliness and social media addiction, we also hypothesize a positive role of online social support and self-esteem's negative role in social media addiction. Furthermore, we expect that social comparison would be negatively associated with self-esteem and positively with online social support and loneliness. Finally, we assume that online social support would be negatively related to loneliness, while positively related to self-esteem. It should be noted that no study to date has examined these hypothesized relationships as we have stated here. We believe that this path model, going beyond simple regression models, allows us to see these associations in their complexity. Such a model can serve as a useful tool for understanding correlations of background variables predicting outcome variables in a cross-sectional study, even though it does not confirm cause-and-effect relationships.

Figure 1. The Hypothesized Model



Methods

Participants and Data Collection

The present study is based on data from a cross-sectional online survey. The study procedures were carried out in accordance with the Declaration of Helsinki. The study protocol was approved by the Institutional Review Board of the Doctoral School of Education, University of Szeged, Hungary (No. 6/2021). All subjects were informed about the study and all provided informed consent. After obtaining the ethical permission, data were collected in the spring of 2022. Students of the University of Szeged were recruited via an online questionnaire package hosted on Google Forms. Calls for participation were posted on different social networking sites as well as in specific university groups and communities in which we expected higher rates of engagement. Participation was voluntary and confidential: to be eligible, students had to be 1) at least 18 years old, 2) Hungarian citizens, and 3) willing to participate in the study. Respondents were informed about the details of the study and their consent was obtained.

A total of 201 participants (70.6% women, aged between 18 and 30 years, M = 21.80 years; *SD* = 2.77) completed the questionnaire. We note the higher engagement of females while recognizing that this phenomenon is not unusual in online surveys, due to the higher willingness of women to take part and feel more comfortable responding to online surveys.

Measures

Bergen Social Media Addiction Scale (BSMAS)

The Hungarian validated version (Bányai et al., 2017) of the six-item Bergen Social Media Addiction Scale (Andreassen et al., 2017) was used to assess the level of social media addiction. The scale was adapted from the previously validated Bergen Facebook Addiction Scale (Andreassen et al., 2012). The items concern experiences occurring over the past 12 months and are rated on a five-point Likert scale ranging from 1 (very rarely) to 5 (very often) (e.g., "How often during the last year have you used social media so much that it has had a negative impact on your job/studies?"). Participants' ratings were summed across the six items of the scale to form a total "problematic social media score", with higher scores indicating a greater level of problematic use. The overall scale was reliable with a Cronbach's α = .74.

Iowa Netherlands Comparison Orientation Measure (INCOM)

The Hungarian version (Piko et al., 2005) of the Iowa Netherlands Comparison Orientation Measure (Gibbons & Buunk, 1999) was used to explore social comparison tendencies. The scale included 11 items (e.g., "I often compare myself to others with respect to what I have accomplished in life."). Participants could rate their agreement with each statement on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A higher score reflects a greater tendency to make social comparisons. The overall scale was reliable with a Cronbach's α = .82.

Online Social Support Scale (OSSS)

For measuring the level of online social support, the authors translated and back-translated the 40-item Online Social Support Scale (Nick et al., 2018). This self-report inventory evaluates various forms of online social support, such as guidance or attachment (e.g., "People tell me things I want to know online."), which showed evidence of a single underlying (unidimensional) factor. Answers were scored on a five-point Likert-type scale from 1 representing "never" to 5 representing "a lot"; higher summary scores reflect greater levels of online social support. The overall scale was reliable with a Cronbach's α = .97.

Rosenberg Self-Esteem Scale (RSE)

The Hungarian validated version (Sallay et al., 2014) of the Rosenberg Self-Esteem Scale (Rosenberg, 1979) was applied to measure individual self-esteem. The scale included ten items assessing positive and negative self-cognitions. Replies were scored on four-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree). Negative items were first reverse-scored and then added to the sum of the positive items. Higher scores suggest greater levels of self-esteem. The overall scale was reliable with a Cronbach's α = .92.

UCLA Loneliness Scale (revised form)

We measured loneliness using the Hungarian version (Csóka et al., 2007) of the UCLA Loneliness Scale (revised form) (Russell et al., 1980). The scale contains 20 items (e.g., "I have nobody to talk to.") with ten reverse-scored items (e.g., "There are people who really understand me."). Responses were coded from 1 to 4 (indicating levels of agreement with each statement). The overall scale was reliable with a Cronbach's α = .94.

Statistical Analysis

First, after testing our data for normal distribution, descriptive statistics and correlation coefficients were calculated for study variables. As the main focus of our study, we ran structural equation modeling by IBM SPSS AMOS 24.0 to test the goodness of fit for our hypothesized model. Although the cross-sectional design does not allow us to justify cause-and-effect relationships, this model might provide useful information on associations among study variables. We based the path analysis on the maximum likelihood estimation method, and acceptable model fit criteria consisted of the following: nonsignificant chi-square value, root mean square error of approximation (RMSEA) ≤ .06, comparative fit index (CFI) ≥ .95, and standardized root mean square residual (SRMR) ≤ .08 (Hu & Bentler, 1998). Coefficients of direct and indirect effects were estimated with a bias-corrected percentile method, 2000 bootstrap samples, and a 95% confidence interval. We applied a user-defined estimated function to determine specific indirect effects within the model.

Results

Table 1 shows descriptive statistics (mean, *SD*, minimum and maximum values) for the scales, as well as zero-order correlations among the study variables. The social media addiction score was positively correlated with online social support, social comparison, and loneliness, while negatively with self-esteem: correlations varied from weak to moderate. Online social support was negatively associated with loneliness and positively (but only slightly) with social comparison and self-esteem. A moderate positive relationship existed between loneliness and social comparison, with the latter being negatively (and also moderately) related to self-esteem. Finally, we found a strong negative correlation between loneliness and self-esteem.

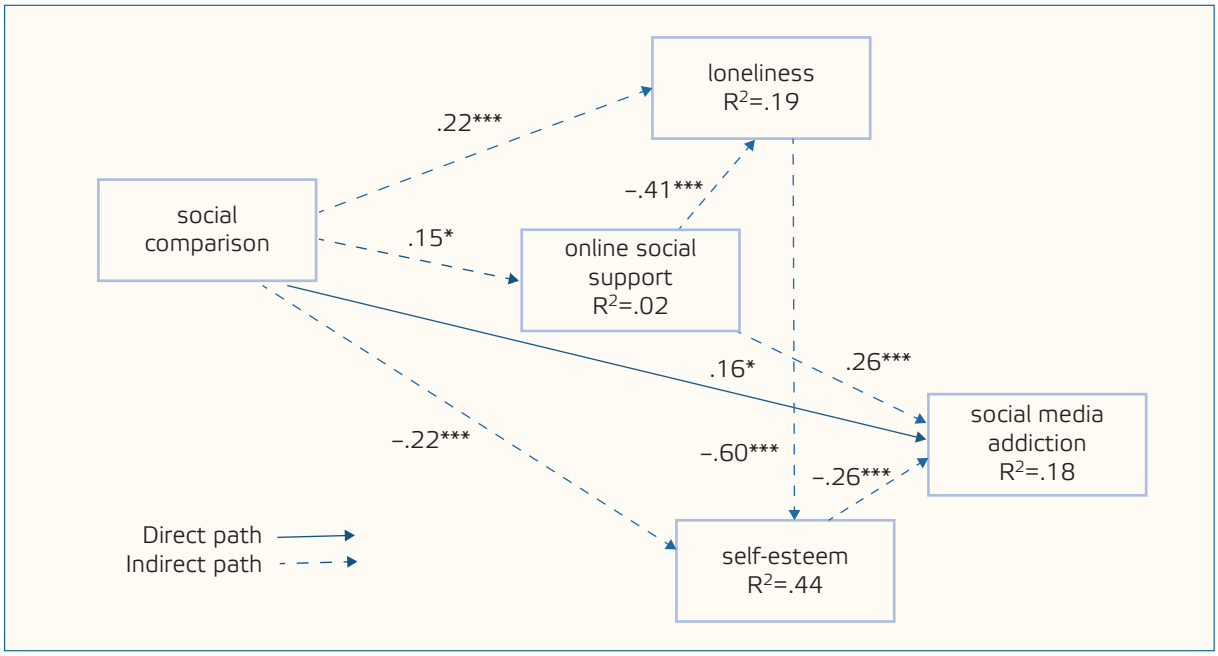
Regarding the hypothesized model, there was a significant chi-square value (χ^2 = 86.49, *df* = 2, *p* <.001), CFI = .57; RMSEA = .05; SRMR = .14, suggesting a poor model fit. Thus, we introduced a new path due to a strong

Table 1. Descriptives and Correlations (*N* = 201).

Variables (Min.–Max.)	Mean *(SD)* Skewness *(SE)* Kurtosis *(SE)*	1	2	3	4	5
1. Bergen Social Media Addiction Scale (BSMAS) (6–30)	15.54 *(4.64)* 0.11 *(.17)* −0.47 *(.34)*	1	.03	.37	.71	0.14
2. Online Social Support Scale (OSSS) (40–191)	111.31 *(34.26)* −0.07 *(.17)* −0.64 *(.34)*	.24**	1			
3. Iowa Netherlands Comparison Orientation Measure (INCOM) (15–55)	39.14 *(7.62)* −0.57 *(.17)* 0.02 *(.34)*	.29***	.15*	1		
4. UCLA Loneliness Scale (revised form) (20–77)	38.38 *(12.18)* 0.57 *(.17)* −0.33 *(.34)*	.15*	−.37***	.16*	1	
5. Rosenberg Self-Esteem Scale (RSE) (10–40)	27.90 *(7.37)* −0.08 *(.17)* −0.80 *(.34)*	−.27***	.16*	−.32***	−.63***	1

Notes. Correlation coefficients. *p < .050.
**p < .010.
***p <.001.

Figure 2. The Final Model of Social Media Addiction with Significant Paths, Standardized Estimates and Explained Variance



*p < .050, **p < .010, ***p < .001.

correlation between loneliness and self-esteem. The implementation of an additional path from loneliness to self-esteem resulted in a path model which had a good fit with indicators of a nonsignificant chi-square (χ^2 = 1.31; *df* = 1; p > .050); CFI = .99; RMSEA = .04; SRMR = .01 (see Figure 2).

Only one path from online social support to self-esteem was found to be non-significant in the hypothesized model (β = -.01; p > .050), thereby we excluded it from further analyses. Social comparison was positively associated with social media addiction (β = .16; p = .020), loneliness (β =.22; p < .001), and online social support (β = .15; p = .030), while it was negatively associated with self-esteem (β = -.22; p < .001). Loneliness was a negative correlate of self-esteem (β = -.60; p < .001). Online social support was associated with social media addiction (β = .26; p < .001) and it was negatively related to loneliness (β = -.41; p < .001). Finally, self-esteem was negatively associated with social media addiction (β = -.26; p < .001) "(see Figure 2 and Table 2).

The specific indirect effect of social comparison on social media addiction via the mediators, that is, loneliness and self-esteem, was significant. Moreover, this same effect was mediated by online social support which was significant, as well. As we expected, based on previous literature, this investigated indirect effect mediated by self-esteem was also significant. Finally, the specific indirect effect of social comparison on social media addiction mediated by online social support and loneliness was found to be significant (see Table 3).

Table 2. Unstandardized Parameters of Path Analysis

Path	B	S.E.	C.R.	*p*	Label
social comparison → online social support	.69	.31	2.21	.030	p5
social comparison → loneliness	.36	.10	3.44	.000	p1
online social support → loneliness	−.14	.02	−6.27	.000	p3
social comparison → self-esteem	−.21	.05	−3.99	.000	p8
online social support → self-esteem	−.01	.01	−0.48	.630	p7
loneliness → self-esteem	−.36	.04	−10.31	.000	p4
online social support → social media addiction	.04	.01	3.85	.000	p6
social comparison → social media addiction	.10	.04	2.374	.020	p2
self-esteem → social media addiction	−.17	.04	−3.78	.000	p9

Notes. Abbreviations: SE: Standard error of regression weight estimate; CR: Critical Ratio.

Table 3. Estimates of Specific Indirect Effects

Specific indirect effect	Estimate	Lower	Upper	*p*
social comparison → loneliness → self-esteem → social media addiction	–.010	–.022	–.001	.019
social comparison → online social support → social media addiction	.024	.003	.058	.030
social comparison → self-esteem → social media addiction	.035	.013	.075	.001
social comparison → online social support → loneliness → social media addiction	–.002	–.004	–.001	.001

Discussion

Our study aimed to further explore the role of social comparison combined with online social support, loneliness and self-esteem, and their relationship to social media addiction with special emphasis on their opposing interrelationships. This contradiction may stem from both beneficial and unfavorable consequences of social comparison and online social support on social media platforms. Our results suggest that social comparison does appear to directly contribute to social media addiction. In addition, the association between online social support and social media addiction was also significant. Several paths – including online social support, loneliness, and self-esteem – mediated the link between social comparison and social media addiction.

Our result concerning the direct relationship of social comparison with social media addiction stands consistent with previous findings (Kim et al., 2021; Vogel et al., 2014). Despite the fact that upward social comparison may lower one's self-worth and help develop envy and even anxiety or depression (Appel et al., 2016; Haferkamp & Krämer, 2011; Hawes et al., Vogel et al., 2014; Wang et al., 2017), it may also strengthen one's positive self-concept and provide feelings of inspiration, drive, or even contentment (Kim et al., 2021). Our findings on the negative association with self-esteem and the positive one with loneliness may also support these expected relationships. Comparing ourselves to others remains a basic human need that can urge people to overuse social media to the point of addiction. This may be an explanation for social networking sites being the most popular and addictive platforms on the internet (American Psychiatric Association, 2013).

Moreover, social comparison is not necessarily upward in its direction and the individual can experience not only negative but also positive experiences from the social comparison processes. Our study also suggests that social comparison may help develop online groups for people with similar interests which results in online social support as a source of social capital (Li et al., 2022). Our results on the negative association between online social support and loneliness also imply that online social support may be a remedy for loneliness. Based on all this, we can say that social media is Janus-faced. Those having strong social comparison tendencies are more likely to experience loneliness (Dibb & Foster, 2021). However, obtaining online social support can reduce feelings of loneliness.

Despite these aforementioned beneficial effects, online social support can strengthen addiction. In the current study, online social support was positively associated with social media addiction. This finding supports previous work on the addictive role of online social support (Luchtefeld & Jordan, 2022). Those seeking and receiving social support on social media enjoy these favorable effects (Caba Machado et al., 2023; Luchtefeld & Jordan, 2022; van Duin et al., 2021). While recent studies have reported that offline social support might serve as a protective factor against internet and social media addictions (van Duin et al., 2021), our data support the controversial role of online social support. Thus, due to several differences from offline social support, relationships with social media addiction needed further examination.

Besides a direct positive contribution to social media addiction, loneliness and self-esteem also mediated the link between social comparison and social media addiction, resulting in a path with a different outcome. Namely, social comparison may strengthen loneliness, which has a negative effect on self-esteem, and finally, self-esteem can reduce the use of social networking sites and services. Self-esteem had been previously found to be a protective factor against social media addiction (Andreassen et al., 2017). This path suggests that when people do not benefit from online activities, such as obtaining social support – as these may increase loneliness and lower people's self-esteem – they are less predisposed to addiction due to negative experiences.

Strengths and Limitations

The current study provides evidence to the multiple links between social comparison, online social support, loneliness, self-esteem and social media addiction. To the best of our knowledge, this is the first study investigating these associations among the younger Hungarian population, therefore this can be understood as another novelty of our study. Despite the uniqueness of the study, we note some limitations. First, the cross-sectional study design does not allow us to justify cause-and-effect relationships. Since our data were exclusively based on self-reporting, biases may happen in evaluation of certain feelings. We included only university students (specifically students of one university whom we could reach easily on special Facebook groups). Whereas our experience indicates that this procedure would elevate the validity of replies, the nonrepresentative sampling may lower the level of generalizability. The sample size stood relatively low due to the small willingness of university students to participate; however, we decided to include only motivated and voluntary students without any pressure or providing them with financial or academic benefits. All in all, we really think that these preliminary findings would motivate further investigations into these associations with greater sample size, particularly in relation to online social support and social comparison. Future research should also include various dimensions of social comparisons in analyzing social media addiction, both online and offline. Other variables may also be included in future models, e.g., social anxiety or depression.

Conclusion, Implications, and Future Directions

In conclusion, we highlight the importance of paying attention to the double-edged sword of social comparison and online social support: despite their beneficial role in bringing together people with similar interests, they may lead to addiction. On social networking sites, people can easily get into contact with others and obtain online social support (Caba Machado et al., 2023). They may feel that belonging to an online community can satisfy their social needs which may lower their loneliness (Koo et al., 2015). While self-esteem may be protective against addiction, negative experiences through social comparison can bear a detrimental effect on one's self-worth and increase loneliness. Although online social support may foster prosocial behavior (Li et al., 2022), the more time spent online, the greater the chance to develop an addiction, thus neglecting other parts of our social life; e.g., offline social relationships (Haferkamp & Krämer, 2011; Koo et al., 2015; Mantzouranis et al., 2019).

It is a great challenge to avoid the trap of getting addicted to social media when we experience temporary beneficial events in online activities. We underscore the importance of learning to consciously manage social comparison tendencies (online, offline), which may contribute to negative cognitive concepts such as envy or anxiety, and even social media addiction. While media literacy: i.e., a skill to interpret media messages, has been recognized a long time ago, we also need to develop a training/course for university students about social media literacy to understand not only the risks and negative social and health consequences but also positivity biases on social media (Schreurs & Vandenbosch, 2022). Future research should thus focus on effective interventions towards reasonable online activities in order to avoid the trap of social media addiction without missing out on the benefits of online social support.

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The authors declare no conflict of interest.

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This manuscript is the authors' original work.
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References

Alsunni, A. A., & Latif, R. (2021). Higher emotional investment in social media is related to anxiety and depression in university students. *Journal of Taibah University Medical Sciences, 16*(2), 247–252. https://doi.org/10.1016/j.jtumed.2020.11.004

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

Andreassen, C. S., Pallesen, S., & Griffiths, M. D. (2017). The relationship between addictive use of social media, narcissism, and self-esteem: Findings from a large national survey. *Addictive Behaviors, 64*, 287–293. https://doi.org/10.1016/j.addbeh.2016.03.006

Andreassen, C. S., Torsheim, T., Brunborg, G. S., & Pallesen, S. (2012). Development of a Facebook addiction scale. *Psychological Reports, 110*(2), 501–517. https://doi.org/10.2466/02.09.18.PR0.110.2.501-517

Appel, H., Gerlach, A. L., & Crusius, J. (2016). The interplay between Facebook use, social comparison, envy, and depression. *Current Opinion in Psychology, 9,* 44–49. https://doi.org/10.1016/j.copsyc.2015.10.006

Baccarella, C. V., Wagner, T. F., Kietzmann, J. H., & McCarthy, I. P. (2018). Social media? It's serious! Understanding the dark side of social media. *European Management Journal, 36*(4), 431–438. https://doi.org/10.1016/j.emj.2018.07.002

Bányai, F., Zsila, Á., Király, O., Maraz, A., Elekes, Z., Griffiths, M. D., Andreassen, C. S., & Demetrovics, Z. (2017). Problematic social media use: Results from a large-scale nationally representative adolescent sample. *PLoS ONE, 12*(1), Article e0169839. https://doi.org/doi:10.1371/journal.pone.0169839

Boyd, D. M., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication, 13*(1), 210–230. https://doi.org/10.1111/j.1083-6101.2007.00393.x

Burnell, K., George, M. J., Vollet, J. W., Ehrenreich, S. E., & Underwood, M. K. (2019). Passive social networking site use and well-being: The mediating roles of social comparison and the fear of missing out. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, *13*(3), Article 5. https://doi.org/10.5817/CP2019-3-5

Caba Machado, V., Mcilroy, D., Padilla Adamuz, F. M., Murphy, R., & Palmer-Conn, S. (2023). The associations of use of social network sites with perceived social support and loneliness. *Current Psychology, 42,* 14414–14427. https://doi.org/10.1007/s12144-021-02673-9

Cheng, C., Lau, Y.-C., Chan, L., & Luk, J. W. (2021). Prevalence of social media addiction across 32 nations: Meta-analysis with subgroup analysis of classification schemes and cultural values. *Addictive Behaviors, 117*, Artcile 106845. https://doi.org/10.1016/j.addbeh.2021.106845

Csóka, S., Szabó, G., Sáfrány, E., Rochlitz, R., & Bódizs, R. (2007). Kísérlet a felnőttkori kötődés mérésére – A kapcsolati kérdőív magyar változata [An attempt to measure adult attachment – The Hungarian version of the Relationship Scale Questionnaire]. *Pszichológia, 27*(4), 333–355.

Dibb, B., & Foster, M. (2021). Loneliness and Facebook use: The role of social comparison and rumination. *Heliyon*, *7*(1), Article e05999. https://doi.org/10.1016/j.heliyon.2021.e05999

Eastin, M. S., & LaRose, R. (2005). Alt. support: Modeling social support online. *Computers in Human Behavior, 21*(6), 977–992. https://doi.org/10.1016/j.chb.2004.02.024

Festinger, L. (1954). A theory of social comparison processes. *Human Relations, 7*(2), 117–140. http://dx.doi.org/10.1177/001872675400700202

Gibbons, F. X., & Buunk, B. P. (1999). Individual differences in social comparison: Development of a scale of social comparison orientation. *Journal of Personality and Social Psychology, 76*(1), 129–142. https://doi.org/10.1037/0022-3514.76.1.129

Haferkamp, N., & Krämer, N. C. (2011). Social Comparison 2.0: Examining the effects of online profiles on social-networking sites. *Cyberpsychology, Behavior, and Social Networking, 14*(5), 309–314. https://doi.org/10.1089/cyber.2010.0120

Hawes, T., Zimmer-Gembeck, M. J., & Campbell, S. M. (2020). Unique associations of social media use and online appearance preoccupation with depression, anxiety, and appearance rejection sensitivity. *Body Image, 33*, 66–76. https://doi.org/10.1016/j.bodyim.2020.02.010

Hu, L.-T., & Bentler P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods, 3*(4), 424–453. https://doi.org/10.1037/1082-989X.3.4.424

Kim, H., Schlicht, R., Schardt, M., & Florack, A. (2021). The contributions of social comparison to social network site addiction. *PLoS ONE, 16*(10), Article e0257795. https://doi.org/10.1371/journal.pone.0257795

Kitsantas, A., Dabbagh, N., Chirinos, D. S., & Fake, H. (2016). College students' perceptions of positive and negative effects of social networking. In T. Issa, P. Isaias, & P. Kommers (Eds.), *Social networking and education. Lecture notes in social networks* (pp. 225–238). Springer, Cham. https://doi.org/10.1007/978-3-319-17716-8_14

Koo, H. J., Woo, S., Yang, E., & Kwon, J. H. (2015). The double meaning of online social space: Three-way interactions among social anxiety, online social behavior, and offline social behavior. *Cyberpsychology, Behavior, and Social Networking, 18*(9), 514–520. https://doi.org/10.1089/cyber.2014.0396

Li, W., Chen, M., & Li, X. (2022). More interactions, more prosociality? An investigation of the prosocial effect of online social interactions among adolescents. *Cyberpsychology, Behavior, and Social Networking, 25*(7), 432–438. https://doi.org/10.1089/cyber.2021.0343

Luchtefeld, C., & Jordan, K. D. (2022). Individual differences influencing the relationship between online social support and addictive use of social media. *Telematics and Informatics Reports, 8*, Article 100025. https://doi.org/10.1016/j.teler.2022.100025

Mahapatra, S. (2019). Smartphone addiction and associated consequences: Role of loneliness and self-regulation. *Behaviour and Information Technology, 38*(8), 833–844. https://doi.org/10.1080/0144929X.2018.1560499

Maksl, A., & Young, R. (2013). Affording to exchange: Social capital and online information sharing. *Cyberpsychology, Behavior, and Social Networking, 16*(8), 588–592. https://doi.org/10.1089/cyber.2012.0430

Mantzouranis, G., Baudat, S., & Zimmermann, G. (2019). Assessing online and offline adolescent social skills: Development and validation of the Real and Electronic Communication Skills Questionnaire. *Cyberpsychology, Behavior, and Social Networking, 22*(6), 404–411. https://doi.org/10.1089/cyber.2018.0655

Nick, E. A., Cole, D. A., Cho, S.-J., Smith, D. K., Carter, T. G., & Zelkowitz, R. (2018). The Online Social Support Scale: Measure development and validation. *Psychological Assessment, 30*(9), 1127–1143. https://doi.org/10.1037/pas0000558

Park, J., Lee, D. S., Shablack, H., Verduyn, P., Deldin, P., Ybarra, O., Jonides, J., & Kross, E. (2016). When perceptions defy reality: The relationships between depression and actual and perceived Facebook social support. *Journal of Affective Disorders, 200*, 37–44. https://doi.org/10.1016/j.jad.2016.01.048

Pellegrino, A., Stasi, A., & Bhatiasevi, V. (2022). Research trends in social media addiction and problematic social media use: A bibliometric analysis. *Frontiers in Psychiatry, 13,* Article 1017506. https://doi.org/10.3389/fpsyt.2022.1017506

Piko, B. F., Luszczynska, A., Gibbons, F. X., Teközel, M. (2005). A culture-based study of personal and social influences of adolescent smoking. *European Journal of Public Health, 15*(4), 393–398. https://doi.org/10.1093/eurpub/cki008

Rosenberg, M. (1979). *Conceiving the Self*. Basic Books.

Russell, D., Peplau, L. A., & Cutrona, C. E. (1980). The Revised UCLA Loneliness Scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology, 39*(3), 472–480. https://doi.org/10.1037/0022-3514.39.3.472

Sallay, V., Martos, T., Földvári, M., Szabó, T., & Ittzés, A. (2014). Hungarian version of the Rosenberg Self-esteem Scale (RSES-H): An alternative translation, structural invariance, and validity. *Mentálhigiéné és Pszichoszomatika 15*(3), 259–275. https://doi.org/10.1556/mental.15.2014.3.7

Samra, A., Warburton, W. A., & Collins, A. M. (2022). Social comparisons: A potential mechanism linking problematic social media use with depression. *Journal of Behavioral Addictions, 11*(2), 607–614. https://doi.org/10.1556/2006.2022.00023

Savci, M., Akat, M., Ercengiz, M., Griffiths, M. D., & Aysan, F. (2022). Problematic social media use and social connectedness in adolescence: The mediating and moderating role of family life satisfaction. *International Journal of Mental Health and Addiction, 20*, 2086–2101. https://doi.org/10.1007/s11469-020-00410-0

Schreurs, L., & Vandenbosch, L. (2022). Should I post my very best self? The within-person reciprocal associations between social media literacy, positivity-biased behaviors and adolescents' self-esteem. *Telematics & Informatics, 73*, Article 101865. https://doi.org/10.1016/j.tele.2022.101865

Sedgwick, R., Epstein, S., Dutta, R., & Ougrin, D. (2019). Social media, internet use and suicide attempts in adolescents. *Current Opinion in Psychiatry, 32*(6), 534–541. https://doi.org/10.1097/YCO.0000000000000547

Shimoga, S. V., Erlyana, E., & Rebello, V. (2019). Associations of social media use with physical activity and sleep adequacy among adolescents: Cross-sectional survey. *Journal of Medical Internet Research, 21*(6), Article e14290. https://doi.org/10.2196/14290

Suls, J., Martin, R., & Wheeler, L. (2002). Social Comparison: Why, with whom and with what effect? *Current Directions in Psychological Science*, *11*(5), 159–163. https://doi.org/10.1111/1467-8721.00191

Sun, Y., & Zhang, Y. (2021). A review of theories and models applied in studies of social media addiction and implications for future research. *Addictive Behaviors*, *114*, Artic1e 106699. https://doi.org/10.1016/j.addbeh.2020.106699

van Duin, C., Heinz, A., & Willems, H. (2021). Predictors of problematic social media use in a nationally representative sample of adolescents in Luxembourg. *International Journal of Environmental Research and Public Health, 18*(22), Article 11878. https://doi.org/10.3390/ijerph182211878

Vannucci, A., Flannery, K. M., & Ohannessian, C. M. (2017). Social media use and anxiety in emerging adults. *Journal of Affective Disorders, 207*, 163–166. https://doi.org/10.1016/j.jad.2016.08.040

Vidal, C., Lhaksampa, T., Miller, L., & Platt, R. (2020). Social media use and depression in adolescents: A scoping review. *International Review of Psychiatry, 32*(3), 235–253. https://doi.org/10.1080/09540261.2020.1720623

Vogel, E. A., Rose, J. P., Roberts, L. R., & Eckles, K. (2014). Social comparison, social media, and self-esteem. *Psychology of Popular Media Culture, 3*(4), 206–222. https://doi.org/10.1037/ppm0000047

Wang, E. S.-T., & Wang, M. C-.H. (2013). Social support and social interaction ties on internet addiction: Integrating online and offline contexts. *Cyberpsychology, Behavior, and Social Networking*, *16*(11), 843–849. https://doi.org/10.1089/cyber.2012.0557

Wang, J.-L., Wang, H.-Z., Gaskin, J., & Hawk, S. (2017). The mediating roles of upward social comparison and self-esteem and the moderating role of social comparison orientation in the association between social networking site usage and subjective well-being. *Frontiers in Psychology, 8*, Article 771. https://doi.org/10.3389/fpsyg.2017.00771

Wilksch, S. M., O'Shea, A., Ho, P., Byrne, S., & Wade, T. D. (2020). The relationship between social media use and disordered eating in young adolescents. *International Journal of Eating Disorders, 53*(1), 96–106. https://doi.org/10.1002/eat.23198

Winstone, L., Mars, B., Haworth, C. M. A., & Kidger, J. (2021). Social media use and social connectedness among adolescents in the United Kingdom: A qualitative exploration of displacement and stimulation. *BMC Public Health, 21*, Article 1736. https://doi.org/10.1186/s12889-021-11802-9

Wong, D., Amon, K. L., & Keep, M. (2019). Desire to belong affects Instagram behavior and perceived social support. *Cyberpsychology, Behavior, and Social Networking, 22*(7), 465–471. https://doi.org/10.1089/cyber.2018.0533

Xiaojun, F., Nianqi, D., Xuebing, D., X., Langxi, L., & Junbin, W. (2019). Do others' self-presentation on social media influence individual's subjective well-being? A moderated mediation model. *Telematics and Informatics, 41*, 86–102. https://doi.org/10.1016/j.tele.2019.04.001

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RESEARCH ARTICLE

Contrasting the Treatment-Related Perceptions of Parents and Their Children: Using Data from Child and Adolescent Brief Mental Health Services Recipients in Canada

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Introduction: Discrepancies between parental and child perceptions of problems and their therapeutic expectations can negatively impact mental health treatment efficacy.
Aims: We sought to explore concordance and discrepancy in families receiving brief, client-centered, and strengths-based mental health services, specifically by contrasting parents' and children's perceptions of the child's presenting issues; treatment expectations; and levels of concern pre- and post-treatment. We also examined the psychometric properties of a therapeutic scaling question on the level of concern, by examining associations with scores from the Strengths and Difficulties Questionnaire.
Methods: Using a mixed-methods approach, we examined data from open- and closed-ended questions, some used as part of the treatment. This included brief descriptions of perceived presenting issues and treatment expectations, and levels of concern on a scale of 1 to 10.
Results: Parent and child descriptions of issues were judged generally congruent 66% of the time. Respectively, minor and major non-congruence was observed 25% and 9% of the time. In terms of treatment expectations, parents were more likely to express a desire to understand the issues and improve communication in the family. Children were more likely to express no expectancies or respond with simple statements (e.g., feel better). Parents initially rated their children's problems as more severe than did their children. We found that the scaling question demonstrated a modest association with the level of concern from the Strength and Difficulties Questionnaire (SDQ).
Conclusions: Even though most parents and their children broadly agree on presenting mental health issues for which they seek counseling, important differences manifest in how they perceive them and what they want accomplished during sessions. Practitioners need to consider, assess, and accommodate such discrepancies.

Keywords: child and adolescent mental health services, parent-child agreement, informant discrepancy, brief therapy, mixed methods

Introduction

When employing a medicalized model, the initial step in mental health therapy would be to complete a full assessment using standardized instruments to determine the presence or absence of clinical conditions. For Child and Adolescent Mental Health Services (CAMHS), researchers consider a combination of parent and child reports as best practice as it provides more complete assessments (De Los Reyes & Kazdin, 2005; Kuhn

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et al., 2017). However, a robust research base shows that children and parents often provide discrepant views related to the child's functioning (Bajeux et al., 2018; Edelbrock et al., 1986) and that child and parent ratings are often discrepant from clinicians' diagnoses (van der Meer et al., 1986). A low agreement exists on clinical diagnoses and desired treatment goals, and parents report greater severity of clinical issues (Achenbach et al., 1987; De Los Reyes et al., 2022; Goolsby et al., 2018; Yeh & Weisz, 2001). One can view this discrepancy as a complication that negatively impacts treatment. For instance, concordant dyads attend a higher number of appointments than non-concordant dyads (Williams et al., 2011), and parent-child discrepancy at the beginning of CAMHS is positively associated with a poorer treatment response (Goolsby et al., 2018). An initial treatment objective in CAMHS, therefore, should be the reduction of parent-child disagreement, when it exists. However, this could engender disagreement among family members and delays in dispensing therapy, thereby adding to the frustration of help-seekers and increasing the likelihood that they will discontinue treatment (Barrett et al., 2008).

Recently, scholars and clinicians have questioned whether informant discrepancy truly represents a treatment complication, arguing that different interpretations of the presenting problem often provide valuable assessment information, the investigation of which could allow for more nuanced and effective therapeutic strategies (De Los Reyes et al., 2011, 2022, 2023; Fitzpatrick et al., 2023). De Los Reyes and colleagues argue that some disagreements in perceptions of child functioning (e.g., whether a child is depressed, anxious, aggressive, etc.) are attributable to the observers' social locations, and thus provide insight into differences in adjustment at school, at home, and among peers. These insights can help determine the need for targeted or global treatment plans and even identify issues that are largely environmental rather than psychological. Some treatment models accommodate informant discrepancies. Shared Decision-Making, which seeks to foster understanding and collaboration between multiple stakeholders, is gaining currency in youth psychotherapy (Fitzpatrick et al., 2023; Langer & Jensen-Doss, 2018).

Based on research regarding parent and child expectations from participating in CAMHS, the areas of greatest agreement are in desiring to reduce emotional and behavioral problems, and accomplish school-related goals (Garland et al., 2004; Jacob et al., 2016; Krause et al., 2021; Ronzoni & Dogra, 2012). In terms of discrepancies, Garland and colleagues found that parents are more likely to desire that their children talk about their feelings, obey parents, and improve self-esteem. Children are more likely to desire improved concentration. Jacob and colleagues concluded that parent goals focus more on the management of child behaviors, and child goals relate more to internalizing/personal difficulties and coping with specific issues. Krause and colleagues studied depression therapy goals, finding that parents prioritized academic functioning, whereas children gave precedence to coping. Thus, one could speculate that parent goals focus more on child capacity for control and fitting in, whereas child goals seem to revolve more around coping and internal adjustment.

Brief Client-Centered and Strengths-Based Therapy

Proponents of brief, client-centered and strengths-based (BCCSB) therapeutic models advocate for less medicalized CAMHS (Bannink, 2007; Lethem, 2002). Rather than employing standardized diagnostic instruments to guide interventions and monitor treatments, BCCSB therapists work with clients in a collaborative and co-constructive manner, guiding them in developing solutions to their problems and drawing upon inner resources, strengths, and resiliencies (Franklin, 2015; Kim, 2008; Perkins, 2006). To facilitate the process, uncomplicated questions are asked, like, "What do you want to talk about today? What concerns you the most?"; and client progress is monitored through scaling questions, such as, "On a ten-point scale, how close are you to achieving your goal? How much do these issues concern you today?"

There is growing evidence that BCCSB therapies can effectively treat an array of mental health problems, delivering services through flexible networks that adapt well to diversity and young people's needs (Barwick et al., 2013; Bond et al., 2013; Ellenbogen et al., 2019; Gingerich & Peterson, 2013; Kim & Franklin, 2009). BCCSB models are also suggested to be less stigmatizing. Because diagnoses are not a focus, service users do not feel labeled as mentally unfit. Likewise, parents are less liable to express culpability for contributing to their children's diagnosis, or as has been noted in prior research, blame both themselves and the child (Goldberg & Campbell, 1997; Lethem, 2002; Partridge et al., 1999; Wheeler, 2001). Through self-directed inquiries, BCCSB therapies help families seek understanding and devise treatment plans. These processes encourage families to believe that their problems are no different than anyone else's and that help-seeking is only required because on this occasion they face an overwhelming confluence of factors.

Service outlets offering BCCSB are an increasingly common feature in public CAMHS systems. Their brief nature ensures that help-seekers access services quickly, experience less psychic discomfort, and gain control of their situation in a timely manner (Hair et al., 2013; Kim, 2008; Miller & Slive, 2004; Stallard & Sayers, 1998). Although parent–child discrepancy might also impede BCCSB treatments, these models are theoretically suited to dealing with such issues because they focus on working toward a shared understanding of the children's problems and co-constructing solutions.

Change Clinic Counseling Service

In response to a need for innovation to reduce CAMHS waiting times and client attrition in the province of Newfoundland & Labrador Canada, a community-university participatory partnership was established in 2009 to develop a BCCSB mental health service for children, youth, and families (Government of Newfoundland & Labrador, 2005). Blending principles from solution-focused, narrative, single session and other approaches to counseling, the Change Clinic (CC) model presented a timely response. Using a collaborative process, the treatment is organized with a mindset of addressing the whole of families' current needs in one session. Clients can choose to extend the treatment for one or two additional sessions (Ellenbogen et al., 2019; Hair et al., 2013); however, in a few cases, the clinician agreed to fourth and fifth sessions.

The first clinic in Newfoundland & Labrador to offer BCCSB therapy to families seeking mental health services, CC operated out of the Janeway Family Centre. The Janeway receives approximately 850 referrals each year for children and adolescents dealing with emotional, social, behavioral, and psychiatric problems. Licensed social workers and psychologists offer a variety of services, including traditional individual and family counseling, and psycho-educational group therapies. The service came about through consultations between the faculty in the School of Social Work at Memorial University and the Janeway program. It should be noted that since the time of data collection, CC services have been transitioned into a walk-in service called Doorways and are offered province-wide.

Study Aims and Research Questions

Our current study represents an exploration of concordance and discrepancy between perspectives of parent and child clients of a BCCSB service called CC. Specifically, we conducted a concurrent mixed methods study (Creswell & Plano Clark, 2011) of client reports, contrasting children's and parents' descriptions of presenting issues, treatment expectations, and pre- and post-treatment levels of concern. We also tested the validity of a single-item scaling question on the level of concern with child issues, by examining correlations with items from a standardized mental health questionnaire. To our knowledge, no one has examined discrepancies in families availing of BCCSB services; extant research has focused on associations between diagnostic scores of different raters in the context of traditional therapies. Additionally, this research adds to the limited qualitative research base on discrepancy. The research questions were:

1. How do parents and their children describe the issues for which they are attending CC, and is there congruence and discrepancy between their descriptions?
2. What do parents and their children expect from CC, and is there congruence and discrepancy between their descriptions?
3. Are there parent-child and pre-post treatment differences in scores from a single item rating regarding the level of concern with child presenting issues?
4. How do single-item ratings correlate with scores from clinical diagnostic tests?

Methods

Participants and Procedure

The Interdisciplinary Committee on Ethics in Human Research approved the research (Ref. No. 20130817-SW). The data was gathered from a convenience sample of families who sought CAMHS from CC between June 2013 and April 2014. The clinic had been operating one day per week for three years prior to the start of data collection. Upon their first arrival to the clinic, a male graduate student acting as research assistant approached all families and read a script inviting them to participate in the study, explaining that their participation is voluntary

and confidential, and that refusal will not affect the quality of services received. Service users over 16 who agreed to participate completed an informed consent form. Parental consent was obtained for children under 16 who agreed to participate.

Of 68 families that were approached to participate, 55 agreed. However, attrition was high for follow-up data and children were not involved in some data collection. This affected the feasibility of some quantitative analyses. Twenty-five child/adolescent participants identified as male and thirty as female. Eighteen were adolescents (12–17 years) and thirty-seven were children (4–11 years). Forty-five parent participants identified as the child's mother and ten as the father. Participants reported they were attending CC services for a range of internalizing behaviors (e.g., anxiety, sadness), externalizing behaviors (e.g., acting aggressively towards others, self-harming), and other psychological issues (e.g., obsessive-compulsive behaviors, eating-related issues).

Data Collection

Prior to receiving services, participants completed the Pre-Interview Questionnaire (PIQ) and Strength and Difficulties Questionnaire (SDQ) in an empty room before their first CC session. If children drew pictures reacting to the PIQ questions, a research assistant asked the child to describe the pictures and took note of their responses. After each session, the participants answered a questionnaire containing the scaling questions. If completed, service providers viewed and discussed the completed PIQ forms as part of the therapeutic sessions, but they did not see the post-treatment responses.

Measurements

Pre- and Post-Treatment Concerns and Expectations of Change Clinic

The self-report PIQ is a clinical form that clinicians designed to help service users choose a priority concern and identify their expectations for the first meeting with their service provider. Clinicians across various mental health service agencies in Canada developed it to gather information that is therapeutically congruent with brief therapy. The PIQ contains non-intrusive, present-focused, and future-oriented questions that allow the clinician to guide the therapeutic conversation toward an outcome that is manageable in a single session (Miller & Slive, 2004). This instrument proved useful to our study objectives because it gathers clinical information that is specifically relevant to BCCSB treatment and thus helps assess the degree to agreement between family members as to what should be the focus of the session. To our knowledge, no one has ever tested the psychometric properties of the PIQ.

The questionnaire consists of seven items. Six are open-ended questions, three of which were employed to gather background information about the service users' mental health concerns (e.g., "What concern do you want to talk about today?", "How does it affect you and other people in your family?", "What do you need us to know today about the concern?"); two of which concerned their expectations from CC (e.g., "What would be the best thing that could happen in our meeting today?"); and one question asked "What have you tried to do to help with the problem and what has worked?" The seventh item is a scaling question; it asks participants to rank their level of concern regarding the problem on a scale of 0–10 (*not at all* to *a lot*). Adults and adolescents completed the full version. Children at 6–11 years of age completed an adapted and abridged version. Forty-three parents (36 mothers; 7 fathers), 27 children (10 females; 17 males), and 12 adolescents (11 females; 1 male) completed the pre-treatment questions. The scaling question was asked again at the end of the first session and following subsequent sessions. The scores from the final meeting were selected as post-treatment ratings, which were completed by 28 parents (25 mothers; 3 fathers), 13 children (7 females; 6 males), and 8 adolescents (6 females; 2 males).

Introduced by de Shazer and colleagues (1986), the scaling question represents an important facet of Solution-Focused Therapy, among other brief therapeutic models. Although the validity and reliability of single items cannot be fully assessed and they fail to capture the dimensionality of constructs, they remain appropriate in therapy. Some have argued that scaling questions provide accurate and stable measurements of overall wellness (e.g., Abdel-Khalek, 2006; Fischer, 2004; West et al., 2009; Willits et al., 2016).

Strengths and Difficulties Questionnaire

Developed by Goodman and colleagues (1998), this widely used child and adolescent mental health diagnostic tool contains four subscales: emotional difficulties, conduct problems, hyperactivity/inattention, peer relationship problems (parental perceptions: Cronbach's α = .79, .65, .75, .61, respectively). The 34-item measure is normed

and possesses satisfactory validity and reliability (Goodman, 2001). We examined associations with two parent- and child-rated global assessments: total score of the four mental health dimensions (Range 0–40) and Question 26, "Overall, do you think your child has [you have] difficulties in one or more of the following areas: emotions, concentration, behavior, or being able to get on with other people?" (answered on a four-point scale: *no, yes minor difficulties, yes definite difficulties, and yes severe difficulties)*. Analyses of changes in mental health prior to and after CC, using this questionnaire, are reported elsewhere (Ellenbogen et al., 2019).

Data Analysis

Thematic analysis was used on qualitative data, drawing from Braun and Clark's (2006) six-step framework. First, Ellenbogen and Power familiarized themselves with the data through repeated contrasting of parent and child reports while searching for examples of congruence, non-congruence, and therapeutic expectations. Second, initial codes were generated based on semantic and latent meanings and then grouped into meaningful units. Third, the codes were used to generate broad categories of: (1) congruence and non-congruence in family members' understanding of the issues for which they are seeking CAMHS and (2) what they expect from treatment. Fourth, the themes were reviewed to ensure coherent patterns existed and that the themes accurately reflected the meanings evident in the dataset as a whole. At this stage, Ellenbogen and Hynes Brothers separately coded the responses of nine dyads and met to compare results and make refinements to the themes and coding process. The process was repeated using the responses of another nine dyads, and then the remaining data was coded. Fifth, the themes were named and defined to reflect the essence of the theme. Sixth, Ellenbogen and Hynes Brothers searched the qualitative data for exemplary quotes, and deepened the descriptions of themes. MAXQDA software was used to code and organize the data.

Due to small sample sizes, we did not attempt advanced statistics. The main comparisons were examined through paired t-tests as these are found to be robust and produce acceptable analyses of data with minor non-normality (Boneau, 1960; Snijders, 2011). Normality was assessed using Shapiro-Wilk's tests. To examine the psychometric properties of the scaling question, Pearson's *r* was used. We examined inter-rater agreement by using weighted Kappa.

Results

Almost half (49.1%; n = 27) of the 55 families who participated attended only one session; 23.6% (n = 13); 16.4% (n = 9), 9.1% (n = 5), and 1.8% (n = 1) of the families attended two to five sessions, respectively. Of the 21 parents who completed both the pre- and post-measures, 47.6% (n = 10), 33.3% (n = 7), 9.5% (n = 2), 4.7% (n = 1), and 4.7% (n = 1) attended one to five sessions, respectively. Of the 16 children and adolescents who completed both pre- and post-measures, six (37.5%) attended one session. 37.5% (n = 6), 18.7% (n = 3), and 6.3% (n = 1) attended two, three, and four sessions, respectively.

Qualitative Analysis

A total of 44 families entered qualitative information on the PIQ. However, only one family member completed some of the questionnaires; other surveys were only partially completed. Details on attrition were provided for each analysis. It should be noted that adolescents' descriptions exhibited greater depth as compared to those of children. Also, the analysis of all the answers on the PIQ revealed that families present a broad range of presenting issues, often describing complex challenges and extenuating circumstances. To ensure coding is informed by these nuances, we considered the entirety of responses in rating the level of concordance between parent and child responses, and treatment expectations. Finally, initial examination of the data revealed that insufficient information, in terms of quantity and depth of child responses, existed to permit contrasts between parents' and children's expected outcome from CC. Therefore, we analyzed and categorized their responses separately.

Parent and Child Perceptions of Presenting Issues

It was impossible to compare the perceptions of 12 parent/child dyads due to missing child forms (6), missing parent form (1), and missing/uncodable child responses to questions on the presenting problems (5). Thus, a

comparison of the data of 32 dyads was undertaken. The analysis of parent and child perceptions regarding the presenting problem resulted in four categories (see Table 1). The efforts of two coders to categorize the data according to this schema produced a moderate level of interrater reliability (κ = .71), see McHugh (2012).

Table 1. Distribution Across Categories of Congruence Between Parent and Child Perceptions of the Issues and Therapeutic Expectation

Coding Categories	*n*	%
Congruence in Presenting Issues (*N* = 32)		
Generally congruent	21	65.6
Similar issue-difference in severity	2	6.3
Minor difference in presenting issue	6	18.8
Substantial disparity	3	9.4
Parent Expected Outcomes of Therapy* (*N* = 41)		
Help for the child	27	65.9
Improved communication	10	22.4
Parent can better understand and help child	20	48.8
Self-help for parent	4	9.8
Child Expected Outcomes of Therapy* (*N* = 24)		
Resolve the issue and feel better	19	79.2
Learning what do to improve things	15	62.5
Facilitate communication	3	12.5

Note. * Percentage does not total 100 because respondents can express multiple categories of expectations.

Generally Congruent Perceptions of Presenting Issues

In 21 (65.6%) dyads, parent and child descriptions of the presenting problems at pretreatment were considered to be generally congruent, despite minor differences in how parents and children described the issues. For example, one parent reported, "[child] anxiety, fears e.g., elevators. Currently doesn't want to leave me, panic attacks, won't leave house... ." In contrast the child wrote, "I'm afraid that my mom won't be there for me 'cause she's been there so much even though she always is... I can't live my life without my mom. I don't wanna go to my friends' houses." Other congruent responses pertained to: not sleeping in one's own bed, cutting/self-harming, dealing with abuse, dealing with parental break-ups, eating problems, aggression, and disliking school.

Similar Presenting Issues – Differences in Severity

In two cases (6% of dyads), we judged that the topics of the presenting issues were generally congruent; however, we considered the parents' and their children' descriptions to be different with respect to the seriousness of the issues. In one case, the adolescent wrote, "I want to talk about how I get frustrated and feel bad when I don't have to" and "because there are only a few things that frustrate me…it's not like 10 things." In contrast, the parents wrote, "[child] becoming over-anxious with various daily issues and simple tasks" and "how [child] is going to 'react' is always a concern." The contrasting descriptions could reflect exaggeration on the part of the parent or the child underappreciating the severity of the issues.

Minor Differences in Descriptions of Presenting Issues

In six dyads (18.8%), we noted minor but clinically relevant differences in descriptions of the presenting issue. In one example, a mother-daughter conflict was identified by both respondents as a key issue; however, the adolescent also noted having anger issues that "affects my day, sometimes schoolwork, sometimes my social skills, and often my sleep." She added, "I don't think [my family notices], I'm good at hiding my feelings." In contrast, the father commented, "Perhaps it's deeper than that, but I think that is the biggest thing", adding, "it doesn't affect [the family] and she is generally a happy child." In another example, both respondents specifically mentioned the child's anxiety and frustration as the central issue, but expressed markedly different interpretations of how family dynamics are impacting this issue. The mother wrote, "very open conversations, stressing [she can] talk to me about anything", in response to a question on what was done to help with the problem. In contrast, the adolescent child wrote, "My mom doesn't understand how she makes me feel and often gets angry if I tell her I am feeling angry because of her ... I tried talking to her, didn't work." Thus, the parent thought that she and her daughter had good lines of communication; however, the daughter felt communication constituted a key issue.

Substantial Disparity in Descriptions of Presenting Issues

In three dyads (9.4%), substantial disparities were identified. Even if some overlap in parents' and children's description was noted, cases were coded as disparate when parents and children focused on largely distinct issues. For example, a child wrote, "Life, I just don't understand a lot of things and why people do certain things and act a certain way." In answer to a question on how it was affecting self and family, they wrote, "not handling things well; have changed a lot; family members dislike it. Mostly mom." In comparison, the parent wrote, "[child] seems sad, confused-anxiety-depressed? Really want to see what I can do to help improve emotional health and stability… Unhealthy friend group/risky behaviors (drinking)/problems at school... [child]s self-confidence is low." In answer to a question on how it was affecting self and family, they wrote, "I probably am not dealing with it as well as I should be; very hard to see her so confused and upset ... Increased conflict in the household." In this case, there may be elements of congruence between family members' descriptions of presenting issues (e.g., a stressful child crisis, characterized by confusion and anxiety, and family conflict). However, coders agreed that there was substantial disparity in their descriptions because the child's central concern pertains to confusion over changes she is experiencing, whereas the parent alludes to extrinsic (problematic friendships, substance use) and self-confidence issues.

In another example, a child expressed a need to talk about her nerves, panicking in elevators, and dad who is "sometime ... mean to me." According to the parent, the key issue is that the child is anxious and having difficulty dealing with the parents' separation. In this case, the child does not mention the parents' separation and the parent does not mention the child's panic attacks, both relevant topics for counseling.

Expected Outcomes from CC for Parents

Questions from the PIQ were used to determine expectations; these are described in the subsection entitled Pre- and Post- Treatment Concerns and Expectations of CC. The 41 parents who provided responses to questions about expected outcomes reflected four categories of expectations (see Table 1). A comparison of the two coder's response categorizations yielded a moderate interrater reliability score ($\kappa = .71$). The four main categories were:

(1) Help for the child in dealing with their issues. Twenty-one parent responses indicated a desire to gain access to guidance and coping strategies that could help their children. One parent wrote, "Just giving us some steps to proceed with will help me." Others wanted, "info and suggestions to help [her daughter] fight the thoughts and behaviors" and for their child to "find a way to deal with their anger."

(2) Improved communication. The answers of ten parents pertained to improving communication with their children and having their children speak more openly about their problems. In response to the question on how they will know the meeting was helpful, one parent wrote his daughter, "opens up and articulates her real frustrations." Other responses include, "if the child talks about what is bothering her" and, "to get him to open up and start talking."

(3) Parent can better understand and help child. Twenty parent answers indicated a desire to better understand their child's struggles and be part of a process that improves the situation. For example, one wanted help "to better understand his issues" and "find the issue causing the problem." Another parent explained, "[We] cannot help her to deal with what is bothering her as we are unable to find the root of the issue." Finally, one parent stated the best thing that could happen out of today's session would be if they "had a better understanding of how [child] feels."

(4) Seeking guidance, reassurance, and coping strategies for their own issues and general wellness. Four parents indicated that they were having a difficult time coping and wanted help for themselves. Two parents in this category recently separated from their partners and were seeking reassurance. One parent indicated she "can't sleep, no appetite", and in answer to the question on how they know the meeting was helpful, wrote, "hopefully I will feel a little more relieved that I made a good decision in leaving and also bring [child] to a new community." One parent, who was struggling with their child's behavior, admitted needing help in dealing with their own anger and sought "coping strategies for us", adding that the meeting would be helpful "If I can keep a cool head while he has his tantrums and not want to pull my hair out and cry."

Expected Outcomes from CC for Children

Child responses aligned with three categories of expectations (see Table 1). We noted that children were less able to express expected outcomes. Of the 38 children who were administered the PIQ, 12 did not answer questions related to their expectations, two provided uncodable answers, and one stated that they did not know, leaving 23 codable responses. A comparison of the two coder's response categorizations yielded a moderate level of interrater reliability ($\kappa = .62$). The three categories of expectations were:

(1) Resolving issues and feeling better. This was the most common expectation, aligning with 19 respondents (82.6%). Children often expressed this expectation through brief statements like, "make me feel better" and "get it to stop." Other respondents expressed expectations that were specific to their concerns. For example, one child hoped to stop fighting with their sibling. In answer to the question about the best thing that could happen today, one adolescent wrote "bullying and rumors would stop", and in answer to how they will know that CC is helpful "I would know how to handle the bullying."

(2) Learning what I can do to improve things. Fourteen children wanted advice and strategies to help them deal with their issues. For example, one child wanted the therapist to "teach me to sleep alone." An adolescent wanted to learn "how to control my anger and stuff to help depression." Another adolescent wanted the therapist to "help me understand why I'm doing this [behavior]" and one other wanted to ask the therapist "a few questions and figure things out."

(3) Facilitating communication. Three children expressed a desire to address the issues through communication. This was expected to take place during the session. An eight-year-old expressed concern with "how my dad treats me and how my mom treats me" and started crying; when asked to explain what was the best thing that could happen today, the child indicated "that we would talk about it." Another wrote, "For me to ask a few questions and try to figure stuff out." It should be noted that ten children mentioned having already tried talking to their parents or a health professional in answer to a question about what they have done to deal with the problem, two adding that it did not help.

Quantitative Analysis

Normality analyses using boxplots and Shapiro-Wilk's test revealed univariate normality in all analyses, and multivariate nonnormality in one analysis, namely a pre-treatment comparison of parent and child/adolescent levels of concern (W = 0.93; p = .037). Inspection of a box plot of difference scores (child-parent) revealed a single outlier (i.e., more than three box-lengths above the edge of the box). The analysis with the outlier excluded did not change the results. The outlier is included in the t-tests presented.

Changes in Level of Concern

Analyses of paired t-tests revealed significant improvements in the level of concern (described in Pre- and Post-Treatment Concerns and Expectations section). Mean levels of parent concern pre-CC (M = 8.14, SD = 1.86) were significantly higher than post-treatment levels (M = 4.71, SD = 2.87; $t(20)$ = 5.30, p < .001 [2.02, 4.78], d = 1.41). A similar effect was found for child/adolescent reports (pre M = 6.53, SD = 3.17; post M = 2.94, SD = 2.57; $t(15)$ = 4.51, p < .001 [.89, 5.29], d = 1.24). We examined whether families who attended only one session reported less change than those attending multiple sessions, as dosage is a plausible moderating factor. We saw no evidence of this in parent reports. The mean change from pre- to post-CC was 3.6 and 3.2 for single- and multiple-session clients, respectively. The mean changes were greater for children receiving higher dosage; the change was 2.2 and 4.4 for single- and multiple-session clients, respectively. However, the sample size is too small to permit statistical testing.

Validity of Single-Item Measure of the Level of Concern

We conducted analyses to better understand this scaling question as a construct. An association was found between the child and parent level of concerns pre-CC, $r(36)$ = .42, p = .014. The level of agreement between child and parent is somewhat stronger for SDQ Total Score, $r(16)$ = .59, p = .016. Sample sizes were sufficient to contrast the different parent report measures at pre-treatment. Interestingly, the single item level of concern was not associated with SDQ Total Score, $r(43)$ = .24, ns. However, it was associated with item 26 of the SDQ, "overall, I think [child] has difficulties in investigated areas," $r(43)$ = .46, p = .002.

Comparison of Parent and Child Levels of Concern

Pre-treatment, parents reported significantly higher levels of concern (M = 8.23, SD = 1.74) than did their children (M = 7.13, SD = 2.83; $t(34)$ = -2.47, p = .019 [-2.01, -0.19], d = 0.47; the measure is described in the Pre- and Post- Treatment Concerns and Expectations section). No post-treatment differences were found, (parent M = 4.24, SD = 2.66; child M = 3.24, SD = 2.49; $t(16)$ = -1.18, p = .254 [-2.79, 0.79]). Given concerns with the

heterogeneity of variance for this analysis, a Wilcoxon signed-rank test was also used to examine differences. The same results were found using the nonparametric test: prior to treatment (z = 2.14, p = .032); and after treatment (z = -1.37, p = .170). Given that the mean difference between parent and child ratings remained roughly the same pre- and post-treatment, about one point, and the sample size was small, we determined that the results are inconclusive with regard to comparing changes in parent and child ratings.

Discussion

This study adds to the considerable literature on informant discrepancy in CAMHS, by using mixed methods to examine reports from parent and child recipients of BCCSB treatment. Examining qualitative data, we found moderate congruence between parents and children in their perspectives on what were the presenting issues; how these issues were impacting respondents and their families; the importance of finding solutions to these issues; and the need to gain coping strategies. According to our analyses, only 9.4% of dyads reported substantively different versions of the presenting problems. However, we regularly noticed minor discrepancies, suggesting divergent interpretations of the presenting problems (e.g., how it came about, the severity of the child's issues) and treatment expectations. Similar to prior discrepancy research, these differences reflected their social locations (De Los Reyes et al., 2022, 2023; Fitzpatrick et al., 2023). Parents tended to focus on external influences on the child's presenting issue, and expectations included wanting to improve parenting capacity and other references to caregiving. Children tended to focus on internal struggles and sometimes qualified family dynamics differently than parents (e.g., greater conflicts). Their expectations centered on feeling better and having their concerns subside; many reported having no expectations.

A minority of parents (22.4%) and children (12.5%) indicated communication as treatment expectations; however, these were expressed differently. Parents wanted their children to "open up more", whereas children indicated a desire to have others contribute to the conversation. Given that 34.4% of dyads express some level of non-concordance in their perceptions concerning the presenting issues, and that minor differences were noted in all dyads, using treatment time to explore and reconcile family members' perspectives on presenting issues and treatment expectations could be beneficial. As noted, treatment success was positively associated with concordant perceptions between family members (Goolsby et al., 2018). Moreover, having family members come to an agreement could help build trust, encouraging a shared belief that they can work through future differences.

In prior research, family members opined that participation in CC inspired hope for change and facilitated communication between parents and children, leading to greater understanding between them (Hair et al., 2013). As such, the perceptions of participating families appear to support an assertion that the treatment reduces informant discrepancy, thereby contributing to increased motivation. However, it should be noted that the treatment model is not focused on getting family members to agree on the presenting problem. Designed from a social constructivist perspective, it allows for multiple interpretations of the presenting problem, without one necessarily being more correct than another. Thus, when working with clients who seek to better understand things, Hair and colleagues (2013) suggest "that practitioners first explore any expected outcomes … further questions about the problem need to be avoided until all participants agree to the focus of the meeting." (p. 22)

It is notable that many parents experienced difficulties in dealing with their children's problems and with parenting in general. Even though the intent is to seek treatment for the child, parents also want guidance and strategies to help them cope with their own situation. Parents of children with mental health problems are known to experience high levels of distress; report being depressed, worried, and tired; doubt their parenting competence; and view their children's problems as causing difficulties in their spousal and family relationships (Angold et al., 1998; Azzi-Lessing, 2013; Farmer et al., 1997; Friesen & Huff, 1996). As Leon (2014) points out, service providers need to look beyond the child's individual mental health challenges and remember that "children do not live in a vacuum." (p. 587) De Los Reyes and Kazdin (2006) found that mother-child discrepancies in perceived child behavior problems were associated with mother-child conflict and that maternal stress mediated this relationship. Thus, discrepancies between child and parent reports might be a sign that there is more to attend to than just the child's wellbeing. Some family situations might require that clinicians work directly with parents or refer them to appropriate resources for adults.

Quantitatively, parent ratings of their children's foremost issue were significantly higher than those of their children; this result is consistent with prior research (Achenbach et al., 1987; Goolsby et al., 2018). Multiple explanations for this difference can exist. Parents might be predisposed to have greater concern (e.g., because they feel they are failing as parents). Children might lack the maturity to accurately assess their problems or underestimate them due to a self-preservation bias (Janoff-Bulman, 1989). Alternatively, the differences in the level of concern might be a consequence of perceiving different presenting problems, with parents tending to report issues of greater severity.

The validation tests revealed that one-item scaling questions used to assess the level of concern have some validity. The scores on the scaling question were correlated with the SDQ question regarding the level of concern, and parent and child reports were also correlated. The low to moderate effect sizes for these correlations are notable, highlighting considerable non-concordance between child and parent reports. Also of note, no association was found between the scaling question and the SDQ total score at pretest, demonstrating that the concerns assessed through this scaling question are not analogous to the gravity of clinical problems.

Used in solution-focused and other therapies, clinicians administer scaling questions to help clients acquire awareness of personal gains. They provide a broad assessment of how far clients feel they have progressed in their efforts to drive change. For example, a reduced level of concern might indicate a successful effort to negotiate periods of instability and crisis, stem negative thoughts and emotions, and re-establish family and individual functioning. The intention of brief therapies, such as CC, is not to diagnose and treat clinical problems. Therefore, the lack of association between the scaling question and the SDQ total score should not be viewed as a validity issue. Also, improvements in wellness might be a precursor to clinical improvements. In earlier research, we found that CC was associated with reductions in clinical mental health issues (Ellenbogen et al., 2019). Nevertheless, all clinicians who employ this scaling question should be mindful that it measures wellness, which is associated with but conceptually distinct from the absence of clinical issues; they also need to ensure that clients understand this distinction.

Strengths and Limitations

Most research on informant discrepancy involves quantitative comparisons of parent- and child-reported scores on standardized mental health instruments. A strength of this study lies in its representing an initial attempt to employ qualitative techniques to develop a schema for researching the perceptions of BCCSB service users in regard to what they think are the presenting issues and what outcomes they expect from treatment. The results of this study can serve to refine clinical and research tools, thereby improving these services' effectiveness.

As is common in community-engaged research, data collection was negatively affected by a lack of on-site data collection experience, scheduling challenges, infrastructure limitations and client challenges (e.g., lack of time, in crisis). Also, our region's ethics protocols require data collection to take place in a different location than the therapy room. In combination, these challenges resulted in a small sample size and high attrition, particularly at post-test. This is a problem in two ways: it reduces statistical power and might have inflated the effect size for post analyses; i.e., study participants might be less inclined to take the time to complete the questionnaire if they do not feel the treatment is helping. The quantitative analyses were also limited by the fact that each participant was instructed to identify the presenting problem and rate how much this problem concerns them. This constitutes a methodological limitation because it cannot be determined whether parents and children were rating the same issue. Another limitation of the study is that it did not collect post-treatment qualitative data or include a comparison group. This would have enabled an examination of whether CC encourages convergence between family members on perceptions of presenting problems and treatment expectations. Finally, we emphasize that this remains a preliminary attempt to gather and analyze BCCSB service user perceptions. Further research is needed to assess the usefulness of the coding schema and the consistency of the results.

Conclusion, Implications, and Future Directions

Using mixed methods to understand and evaluate informant discrepancies, our study found that parents and their children tended to have moderately similar views when asked to describe presenting issues. Parents rated issues as more severe. As in prior research, we found therapeutically relevant discrepancies in a minority of cases, highlighting the value of relying on multiple informants to assess child and adolescent mental health. Treatment expectations were also revealing, with parents seeking ways to be better parents and the children most often wanting to feel better or reporting no expectations.

The findings reinforce the need for CAMHS to provide opportunities for children and parents to express their views of the presenting issues and their therapeutic expectations, and for clinicians to help families work through discrepant perceptions and investigate parent needs for mental health and other help. Even when parents and children express generally concordant perceptions, we noted subtle differences of opinion. The initial success in resolving discrepancy might initiate the motivation for change.

Further research is needed to better understand the meaning of discrepancies and how they impact treatment, and to devise strategies for addressing them. These would need to be adapted to different levels and qualities of discrepancies, and to the possibility that some circumstances might require a deferring of conversations about discrepancy. Also, further examination of the applicability of social constructivist treatment models for helping families with discrepant perceptions merits attention.

Before conducting research on BCCSB services, it will be important to first develop and validate methodologies for researching informant discrepancies. There is a need for strategies that go beyond assessing informant perceptions as being either conforming or non-conforming. These strategies could enable the evaluation of the theoretical underpinnings of BCCSB therapies and make possible treatment refinements and broader improvements to CAMHS. Researchers should consider devising tools that are accessible and conducive to providing in-depth answers, like audio recording. Although the PIQ is a widely used clinical tool that permits acceptable preliminary research, several written answers were brief and ambiguous. Finally, to enable valid comparisons between raters, researchers and clinicians are advised to use scaling questions that assess the overall level of concern.

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Declaration of interest statement

The authors declare no conflict of interest.

Ethical statement

This manuscript is the authors' original work.
All participants engaged in the research voluntarily and anonymously.
Their data are stored in coded materials and databases without personal data.
The studies involving human participants were reviewed and approved by the Interdisciplinary Committee on Ethics in Human Research (Ref. No. 20130817-SW).

Data Availability Statement

Datasets presented in this article are not readily available because we only received participant consent to conduct research on the data, not to make the data publicly available.

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References

Abdel-Khalek, A. M. (2006). Measuring happiness with a single-item scale. *Social Behavior and Personality: An International Journal, 34*(2), 139–150. http://doi.org/10.2224/sbp.2006.34.2.139

Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin, 101*(2), 213–232. http://doi.org/10.1037/0033-2909.101.2.213

Angold, A., Messer, S. C., Stangl, D., Farmer, E. M., Costello, E. J., & Burns, B. J. (1998). Perceived parental burden and service use for child and adolescent psychiatric disorders. *American Journal of Public Health, 88*, 75–80. http://doi.org/10.2105/ajph.88.1.75

Azzi-Lessing, L. (2013). Serving highly vulnerable families in home-visitation programs. *Infant Mental Health Journal, 34*(5), 376–390. http://doi.org/10.1002/imhj.21399

Bajeux, E., Klemanski, D. H., Husky, M., Leray, E., Chee, C. C., Shojaei, T., Fermanian, C., & Kovess-Masfety, V. (2018). Factors associated with parent–child discrepancies in reports of mental health disorders in young children. *Child Psychiatry & Human Development, 49*, 1003–1010. https://doi.org/10.1007/s10578-018-0815-7

Bannink, F. P. (2007). Solution-focused brief therapy. *Journal of Contemporary Psychotherapy, 37*, 87–94. http://doi.org/10.1007/s10879-006-9040-y

Barrett, M. S., Chua, W.-J., Crits-Christoph, P., Gibbons, M. B., & Thompson, D. (2008). Early withdrawal from mental health treatment: Implications for psychotherapy practice. *Psychotherapy: Theory, Research, Practice, Training, 45*(2), 247–267. http://doi.org/10.1037/0033-3204.45.2.247

Barwick, M., Urajnik, D., Sumner, L., Cohen, S., Reid, G., Engel, K., & Moore, J. E. (2013). Profiles and service utilization for children accessing a mental health walk-in clinic versus usual care. *Journal of Evidence-Based Social Work, 10*(4), 338–352. http://doi.org/10.1080/15433714.2012.663676

Bond, C., Woods, K., Humphrey, N., Symes, W., & Green, L. (2013). Practitioner review: The effectiveness of solution focused brief therapy with children and families: A systematic and critical evaluation of the literature from 1990–2010. *Journal of Child Psychology and Psychiatry, 54*(7), 707–723. http://doi.org/10.1111/jcpp.12058

Boneau, C. A. (1960). The effects of violations of assumptions underlying the t test. *Psychological Bulletin*, *57*(1), 49–64. https://doi.org/10.1037/h0041412

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). Sage.

De Los Reyes, A. (2011). Introduction to the special section: More than measurement error: Discovering meaning behind informant discrepancies in clinical assessments of children and adolescents. *Journal of Clinical Child & Adolescent Psychology, 40*(1), 1–9. https://doi.org/10.1080/15374416.2011.533405

De Los Reyes, A., & Kazdin, A. E. (2005). Informant discrepancies in the assessment of childhood psychopathology: A critical review, theoretical framework, and recommendations for further study. *Psychological Bulletin, 131*(4), 483–509. http://doi.org/10.1037/0033-2909.131.4.483

De Los Reyes, A., & Kazdin, A. E. (2006). Informant discrepancies in assessing child dysfunction relate to dysfunction within mother-child interactions. *Journal of Child and Family Studies, 15*, 643–661. http://doi.org/10.1007/s10826-006-9031-3

De Los Reyes, A., Talbott, E., Power, T. J., Michel, J. J., Cook, C. R., Racz, S. J., & Fitzpatrick, O. (2022). The Needs-to-Goals Gap: How informant discrepancies in youth mental health assessments impact service delivery. *Clinical Psychology Review, 92*, Article 102114. https://doi.org/10.1016/j.cpr.2021.102114

De Los Reyes, A., Wang, M., Lerner, M. D., Makol, B. A., Fitzpatrick, O. M., & Weisz, J. R. (2023). The Operations Triad Model and youth mental health assessments: Catalyzing a paradigm shift in measurement validation. *Journal of Clinical Child & Adolescent Psychology. 52*(1), 19–54. https://doi.org/10.1080/15374416.2022.2111684

de Shazer, S., Berg, I. K., Lipchik, E., Nunnally, E., Molnar, A., Gingerich, W., & Weiner-Davis, M. (1986). Brief therapy: Focused solution development. *Family Process, 25*(2), 207–221. http://doi.org/10.1111/j.1545-5300.1986.00207.x

Edelbrock, C., Costello, A. J., Dulcan, M. K., Conover, N. C., & Kala, R. (1986). Parent-child agreement on child psychiatric symptoms assessed via structured interview. *Journal of Child Psychology and Psychiatry, 27*(2), 181–190.

Ellenbogen, S., Hair, H. J., Kirkland Smith, J., & Wilton, P. (2019). The change clinic counselling service: Blending client-centred and strength-based practices to improve mental health services to families. *Canadian Journal of Community Mental Health, 38*(1), 1–8. https://doi.org/10.7870/cjcmh-2018-021

Farmer, E. M. Z., Burns, B. J., Angold, A., & Costello, E. J. (1997). Impact of children's mental health problems on families: Relationships with service use. *Journal of Emotional and Behavioral Disorders, 5*(4), 230–238. http://doi.org/10.1177/106342669700500406

Fischer, R. L. (2004). Assessing client change in individual and family counseling. *Research on Social Work Practice, 14*(2), 102–111. http://doi.org/10.1177/1049731503257868

Fitzpatrick, O. M., Holcomb, J. M., Weisz J. R., & Langer, D. A. (2023). Shared decision-making as a tool for navigating multi-stakeholder discrepancies in youth psychotherapy. *Journal of Clinical Child & Adolescent Psychology, 52*(1), 95–107. http://doi.org/10.1080/15374416.2022.2127105

Franklin, C. (2015). An update on strengths-based, solution-focused brief therapy. *Health & Social Work, 40*(2), 73–76. http://doi.org/10.1093/hsw/hlv022

Friesen, B. J., & Huff, B. (1996). Family perspectives on systems of care. In B. A. Stroul (Ed.), *Children's mental health: Creating systems of care in a changing society* (pp. 41–68). Paul H. Brookes Publishing Co.

Garland, A. F., Lewczyk-Boxmeyer, C. M., Gabayan, E. N., & Hawley, K. M. (2004). Multiple stakeholder agreement on desired outcomes for adolescents' mental health services. *Psychiatric Services, 55*(6), 671–676. https://doi.org/10.1176/appi.ps.55.6.671

Gingerich, W. J., & Peterson, L. T. (2013). Effectiveness of solution-focused brief therapy: A systematic qualitative review of controlled outcome studies. *Research on Social Work Practice, 23*(3), 266–283. http://doi.org/10.1177/1049731512470859

Goldberg, D., & Campbell, F. (1997). Empowerment: A three-session intervention. *Child and Adolescent Mental Health, 2*(1), 34–37. http://doi.org/10.1111/j.1475-3588.1997.tb00043.x

Goodman, R. (2001). Psychometric properties of the Strengths and Difficulties Questionnaire (SDQ). *Journal of the American Academy of Child and Adolescent Psychiatry, 40*(11), 1337–1345. https://doi.org/10.1097/00004583-200111000-00015

Goodman, R., Meltzer, H., & Bailey, V. (1998). The strengths and difficulties questionnaire: A pilot study on the validity of the self-report version. *European Child and Adolescent Psychiatry, 7*, 125–130. https://doi.org/10.1007/s007870050057

Goolsby, J., Rich, B. A., Hinnant, B., Habayeb, S., Berghorst, L., De Los Reyes, A., & Alvord, M. K. (2018). Parent–child informant discrepancy is associated with poorer treatment outcome. *Journal of Child and Family Studies, 27*, 1228–1241. https://doi.org/10.1007/s10826-017-0946-7

Government of Newfoundland & Labrador. (2005). *Working together for mental health: A provincial policy framework for mental health and addictions services in Newfoundland and Labrador*. https://www.gov.nl.ca/hcs/files/publications-working-together-for-mental-health.pdf

Hair, H. J., Shortall, R., & Oldford, J. (2013). Where's help when we need it? Developing responsive and effective brief counseling services for children, adolescents, and their families. *Social Work in Mental Health, 11*(1), 16–33. https://doi.org/10.1080/15332985.2012.716389

Jacob, J., Edbrooke-Childs, J., Holley, S., Law, D., & Wolpert, M. (2016). Horses for courses? A qualitative exploration of goals formulated in mental health settings by young people, parents, and clinicians. *Clinical Child Psychology and Psychiatry, 21*(2), 208–223. https://doi.org/10.1177/1359104515577487

Janoff-Bulman, R. (1989). The benefits of illusions, the threat of disillusionment, and the limitations of inaccuracy. *Journal of Social & Clinical Psychology, 8*(2), 158–175. https://doi.org/10.1521/jscp.1989.8.2.158

Kim, J. S. (2008). Examining the effectiveness of solution-focused brief therapy: A meta-analysis. *Research on Social Work Practice, 18*(2), 107–116. https://doi.org/10.1177/1049731507307807

Kim, J. S., & Franklin, C. (2009). Solution-focused brief therapy in schools: A review of the outcome literature. *Children and Youth Services Review, 31*(4), 464–470. https://doi.org/10.1016/j.childyouth.2008.10.002

Krause, K., Midgley, N., Edbrooke-Childs, J., & Wolpert, M. (2021). A comprehensive mapping of outcomes following psychotherapy for adolescent depression: The perspectives of young people, their parents and therapists. *European Child & Adolescent Psychiatry, 30*, 1779–1791. https://doi.org/10.1007/s00787-020-01648-8

Kuhn, C., Aebi, M., Jakobsen, H., Banaschewski, T., Poustka, L., Grimmer, Y., Goodman, R., & Steinhausen, H.-C. (2017). Effective mental health screening in adolescents: Should we collect data from youth, parents or both? *Child Psychiatry & Human Development, 48*, 385–392. https://doi.org/10.1007/s10578-016-0665-0

Langer, D. A., & Jensen-Doss, A. (2018). Shared decision-making in youth mental health care: Using the evidence to plan treatments collaboratively. *Journal of Clinical Child & Adolescent Psychology, 47*(5), 821–831. https://doi.org/10.1080/15374416.2016.1247358

Leon, A. M. (2014). Research on the challenges faced by families with children experiencing health or mental health problems. *Journal of Social Service Research, 40*(5), 587–590. https://doi.org/10.1080/01488376.2014.955781

Lethem, J. (2002). Brief solution focused therapy. *Child and Adolescent Mental Health, 7*(4), 189–192. https://doi.org/10.1111/1475-3588.00033

McHugh, M. (2012). Interrater reliability: The Kappa Statistic. *Biochemia Medica, 22*(3), 276–282. https://doi.org/10.11613/BM.2012.031

Miller, J. K., & Slive, A. (2004). Breaking down the barriers to clinical service delivery: Walk-in family therapy. *Journal of Marital and Family Therapy, 30*(1), 95–103. https://doi.org/10.1111/j.1752-0606.2004.tb01225.x

Partridge, I., Redmond, C., Williams, C., Black, J., & Richardson, G. (1999). Evaluating family therapy in a child and adolescent mental health service. *Psychiatric Bulletin, 23*(9), 531–533. https://doi.org/10.1192/pb.23.9.531

Perkins, R. (2006). The effectiveness of one session of therapy using a single-session therapy approach for children and adolescents with mental health problems. *Psychology and Psychotherapy: Theory, Research and Practice, 79*(2), 215–227. https://doi.org/10.1348/147608305x60523

Ronzoni, P., & Dogra, N. (2012). Children, adolescents and their carers' expectations of child and adolescent mental health services (CAMHS). *International Journal of Social Psychiatry, 58*(3), 328–336. https://doi.org/10.1177/0020764010397093

Snijders, T. A. B. (2011). *Statistical methods: Robustness*. University of Oxford. https://www.stats.ox.ac.uk/~snijders/SM_robustness.pdf

Stallard, P., & Sayers, J. (1998). An opt-in appointment system and brief therapy: Perspectives on a waiting list initiative. *Clinical Child Psychology and Psychiatry, 3*(2), 199–212. https://doi.org/10.1177/1359104598032005

van der Meer, M., Dixon, A., & Rose, D. (2008). Parent and child agreement on reports of problem behaviour obtained from a screening questionnaire, the SDQ. *European Child & Adolescent Psychiatry, 17*, 491–497. https://doi.org/10.1007/s00787-008-0691-y

West, C. P., Dyrbye, L. N., Sloan, J. A., & Shanafelt, T. D. (2009). Single item measures of emotional exhaustion and depersonalization are useful for assessing burnout in medical professionals. *Journal of General Internal Medicine, 24*, 1318–1321. https://doi.org/10.1007/s11606-009-1129-z

Wheeler, J. (2001). A helping hand: Solution-focused brief therapy and child and adolescent mental health. *Clinical Child Psychology and Psychiatry, 6*(2), 293–306. https://doi.org/10.1177/1359104501006002009

Williams, C. D., Lindsey, M., & Joe, S. (2011). Parent–adolescent concordance on perceived need for mental health services and its impact on service use. *Children and Youth Services Review, 33*(11), 2253–2260. https://doi.org/10.1016/j.childyouth.2011.07.011

Willits, F. K., Theodori, G. L., & Luloff, A. E. (2016). Another look at Likert scales. *Journal of Rural Social Sciences, 31*(3), 126–139. https://egrove.olemiss.edu/jrss/vol31/iss3/6

Yeh, M., & Weisz, J. R. (2001). Why are we here at the clinic? Parent-child (dis)agreement on referral problems at outpatient treatment entry. *Journal of Consulting and Clinical Psychology*, *69*(6), 1018–1025. https://doi.org/10.1037/0022-006X.69.6.1018

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RESEARCH ARTICLE

Moral Suffering in Frontline Social Care Workers: A Study of Moral Injury and Moral Distress

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Introduction: Moral suffering (MS) is psycho-emotional harm derived from a conflict between one's circumstances and one's deeply held moral values. It includes the constructs of moral distress (MD) and moral injury (MI) and is characterized by constraints or mandates preventing the perceived morally correct event. Evidence has demonstrated the application of MS in helping professions, and research has linked MS to a deterioration of mental health, self-identity, worldview, and job-performance.
Aims: In this study, we examined the relationship between MD, MI, burnout, and external/internal constraints in Frontline Social Care Workers (FSCWs) in the UK.
Methods: We employed a quantitative, cross-sectional correlational design, recruiting 119 FSCWs (female = 91.6%, tenure 1–2 years = 27.4%) using convenience sampling. Participants completed an online survey including the Moral Injury Events Scale and the Copenhagen Burnout Inventory. Measures for MD, external constraints (stress, time, and resources), and internal constraints (psychological safety and preparedness) were informed by previous research.
Results: Participants reported a significant prevalence of moderate-to-high MD (25.4%), MI (33.3%), and burnout (64.9%), and we found significant relationships between the constructs and dimensions. Constraints were significant predictors of MS (explaining 35.3% of MD variance and 30.1% of MI variance), with stress, time, and psychological safety making the strongest contributions.
Conclusions: FSCWs can be examined as a unitary population experiencing morally challenging circumstances that may result in MS and burnout. Improved MS measures, increased awareness, and policy shifts are necessary to redefine the paradigm of work-related distress, taking systemic constraints and the potential for moral harm into account.

Keywords: moral suffering, moral injury, moral distress, social care, frontline workers

Introduction

Frontline social care work (FSCW) includes a wide range of non-medical professions operating daily in direct contact with individuals in vulnerable populations (NHS, 2024), advocating for them and supporting them psychologically, emotionally, and practically (UKHSA, 2023). As with other caring sectors, a high level of exposure to others' suffering and vulnerability uniquely defines FSCW, as does a one-way caring relationship with clients (Skovholt, 2005), where it is a job requirement to provide care, empathy, and understanding without expecting it in return (Skillsforcare, 2013), and professionals are educated in a culture of self-sacrifice (Posluns & Gall, 2020).

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It is not surprising then, that these professions are at high risk of mental health issues related to caring for others, such as compassion fatigue, work stress, burnout, and vicarious PTSD (Ondrejková & Halamová, 2022), with one study on UK social workers showing emotional exhaustion prevalence at 73.0% and depersonalization at 26.0% (McFadden, 2015). Social care (SC) rates of work-stress and stress- and mental health-related sickness absences also stand among the highest compared to all other sectors in the UK (Ravalier et al., 2023). This type of work-related mental ill-health carries a very high cost to the individual, with serious physical, psychosocial, and financial ramifications (Lederman et al., 2019), as well as to professional organizations and society, with a UK report estimating the yearly cost of employees' mental health issues at £35 billion, including sick-leave, presenteeism, and staff-turnover (Parsonage & Saini, 2017).

Among the issues faced by professionals in the SC sector, is Moral Suffering (MS), a form of severe moral dissonance which has only recently been given increasing attention (Papazoglou & Chopko, 2017) and that can be defined as "the anguish in response to moral adversity, harms, wrongs, or failures, or unrelieved moral stress" (Rushton, 2018, p. 10). Two dimensions of MS are Moral Distress (MD) and Moral Injury (MI), and both can have a serious impact on professionals' wellbeing (Sugrue, 2019). A consensus on their definitions and interaction has yet to be reached; however, both are a) related to witnessing, committing, or failing to prevent "morally challenging situations and their potential psychological and spiritual consequences for the individual self-integrity" b) due to institutional constraints or mandates, c) in a critical situation (Grimell & Nilsson, 2020, p. 2). The moral infraction shakes the individual's moral core and negatively affects their feelings and beliefs, resulting in MS.

Constraints to the perceived morally correct action can be internal (e.g., lack of psychological safety or preparedness), and/or external (e.g., systemic/institutional issues, such as lack of funding, resources and time, heavy caseloads, inappropriate policies, conflicting interests) (Deschenes et al., 2020; Fourie, 2017). This feature calls into question burnout as the main paradigm of occupational distress (Dean et al., 2019). "A syndrome conceptualized as resulting from chronic workplace stress that has not successfully been managed" (World Health Organization, 2019, para. 3), burnout finds its causes in a failure of the individual to cope with trying circumstances, and its solution in the individual's responsibility to care for themselves (i.e., self-care). MS shifts perspective from an individual failing to a failing of the system, since, while self-care strategies offer important support for individual mental health, they are far from addressing constraints as the potential systemic roots of occupational distress (Dean et al., 2019).

While sparsely examined, MS remains a very prevalent issue and has been linked to the development of mental health disorders (Hall et al., 2021; Hanna, 2004). Recently, a BMA survey of over 1900 UK doctors revealed that more than 48.0% of the respondents had not heard of MI, and more than 43.0% had not heard of MD, whereas 78.4% responded that MD resonated with their work-experience, and 51.0% said the same of MI (BMA, 2021). A recent meta-analysis found that potentially morally injurious experiences (PMIEs) accounted for a significant variance: 9.4% of PTSD, 5.2% of depression, and 2.0% of suicidality (Williamson et al., 2018). PMIEs were also associated with higher levels of anxiety and behavioral issues (i.e., hostility and aggression). MS has also been associated with other caring-related issues such as compassion fatigue, vicarious PTSD and burnout (Pehlivan & Güner, 2018) and has been consistently linked to occupation, with health and social care, and military and police sectors being at especially high risk (Braxton et al., 2021).

Given the direct link between MS and the (in)ability to provide high ethical standards of care, it has been proposed that the COVID-19- and post-pandemic contexts had a strong impact on the prevalence and severity of these issues (Williamson et al., 2020), and generally on the mental health of helping professionals (Muller et al., 2020; Pfefferbaum & North, 2020). For example, the same 2021 BMA survey showed that 96.4% of respondents thought that COVID-19 had significantly increased their risk of MD. Moreover, these factors have aggravated the existing crisis in the SC sector, with a report showing staff turnover rates at 34.4%, 8.2% job vacancies, and average worker absences having almost doubled since 2020 (Skillsforcare, 2022/23). The pandemic also highlighted and exacerbated the scarcity of resources and systemic issues that may place professionals in morally conflicting circumstances (Godshall, 2021). PPE shortages, increased workloads, clients' increasingly complex needs, and lack of resources, constituted some of the obstacles faced by SCW (Ashcroft et al., 2022). Moreover, SC sectors such as Violence Against Women and Girls (VAWG) and Social Work are exposed daily to immoral acts and acts of interpersonal violence; issues such as intimate-partner violence, domestic violence, and domestic homicides also saw a steep rise (ONS, 2020), whereas resources for clients (refuges, advocacy, child protection, etc.) decreased (Romanou & Belton, 2020), pointing to an increase in the external constraints and moral challenges known to contribute to MS (Ashcroft et al., 2022). On the other hand, the post-pandemic and post-Brexit context and transitions have not been without unique and acute moral challenges due to factors including the cost-

of-living crisis, staff and resource shortages, industrial strikes, and the severe strain on services (Waitzman, 2022).

These factors implicate MS as a topical, prevalent, costly, and understudied issue, related to a host of mental health conditions. This study aimed to examine MD and MI in relation to external/internal constraints and burnout within the population of frontline social care workers (FSCWs), to gain a clearer picture of the prevalence of MS, its roots, and related factors. FSCWs include, but are not limited to, social workers, care home workers, VAWG workers, support workers, and care workers. MS has rarely been examined in the context of this population (Greason, 2020), and while the challenges faced by individual professions within this population, such as social workers (Kinman & Grant, 2010) and care home workers (Kabir et al., 2020), have been looked at, FSCW as a whole, and other SC professions (such as VAWG workers), have rarely been examined. This constitutes a notable gap in knowledge, given that FSCWs are highly likely to be exposed to the moral conflicts and circumstances associated with MS (Webber et al., 2021). This study aimed to help understand MS as experienced by an often overlooked population (Lev & Ayalon, 2016), and shed light on the systemic roots of mental health issues in caring professions.

Situating Frontline Social Care Workers

The Social Care Sector in the UK employs over 1.55 million professionals (Foster, 2024; Kulakiewicz et al., 2022) in a wide range of professions supporting vulnerable individuals from a non-clinical standpoint (NHS, 2017). Vulnerability is defined as requiring additional care, assistance, or safeguarding due to characteristics including age, disability, gender, and background (OHID, 2022). Therefore, vulnerable populations supported by SCWs may include children, elderly, disabled, refugees, disadvantaged, and survivors of violence. Here, the "frontline" designation describes those SCWs who – as opposed to, for example, management and administration – have a caseload responsibility and work in direct contact with service users (NHS, 2024). Day-to-day tasks for FSCWs may include supporting service users with protection, housing, financial, and legal needs, risk- and needs-assessing and safety planning, liaising and advocating with other professionals on service users' behalf, as well as providing for their basic care needs. Necessary values across SC include empathy, reliability, openness, and understanding (Professional Standards of Social Work England, 2019), selflessness and compassion (NIA, 2020), as well as warmth, a commitment to quality care, the ability to stay calm in a crisis, and to recognize and manage one's own stress (Skillsforcare, 2022).

While backgrounds and tasks may vary across the population, for the purposes of this paper, we examined FSCWs as a unitary population characterized by the features noted above, while individual professions and service user groups did not factor in the analysis.

Background on Moral Suffering

While originating from distinct theories in different sectors, MD and MI have since been included in the general construct of moral suffering (Braxton et al., 2021; Mänttäri-van der Kuip, 2020). MS indicates the experience of psycho-emotional, social, and existential harm arising from a conflict between circumstances and deeply ingrained moral values (Sugrue, 2019). Several different definitions have been given for MD and MI, distinguishing between 1) job-specifics (e.g., military, nursing, or unrelated to occupation), 2) presence or absence of constraints, 3) role of the affected individual (witnessing or perpetrating), 4) occurrence of moral conflict by accident or by choice, and 5) emotional reaction to such conflicts (e.g., frustration and betrayal). However, a more recent broadening of the MI and MD definitions (Campbell et al., 2016; Litz et al., 2009), proposed integrating these concepts into the construct of MS. Figure 1 shows a conceptual model featuring the two MS constructs of MI and MD for the purposes of this paper.

While MS and burnout can contribute to each other, share several symptoms (e.g., depression, anxiety, etc.), and are both generally linked to occupation, they are distinct constructs with different causes and loci (Dean et al., 2019; Fumis et al., 2017; Rushton, Nelson, et al., 2022). Burnout can occur as a reaction to chronic stressors at work and the individual's depleted internal resources (Maslach et al., 2001), whereas MS arises when circumstances create dissonance with the individual's moral values, destabilizing their self-identity and worldview (Gabel, 2013; Wong, 2020). Similarly, where general- and work-stress relate to psychophysiological responses to overwhelming circumstances overtaking one's ability to cope and threatening one's wellbeing (Hutmacher, 2021), MS results from a threat to profoundly engrained moral values, such as fairness, compassion, respect, and ethical practice (Čartolovni et al., 2021).

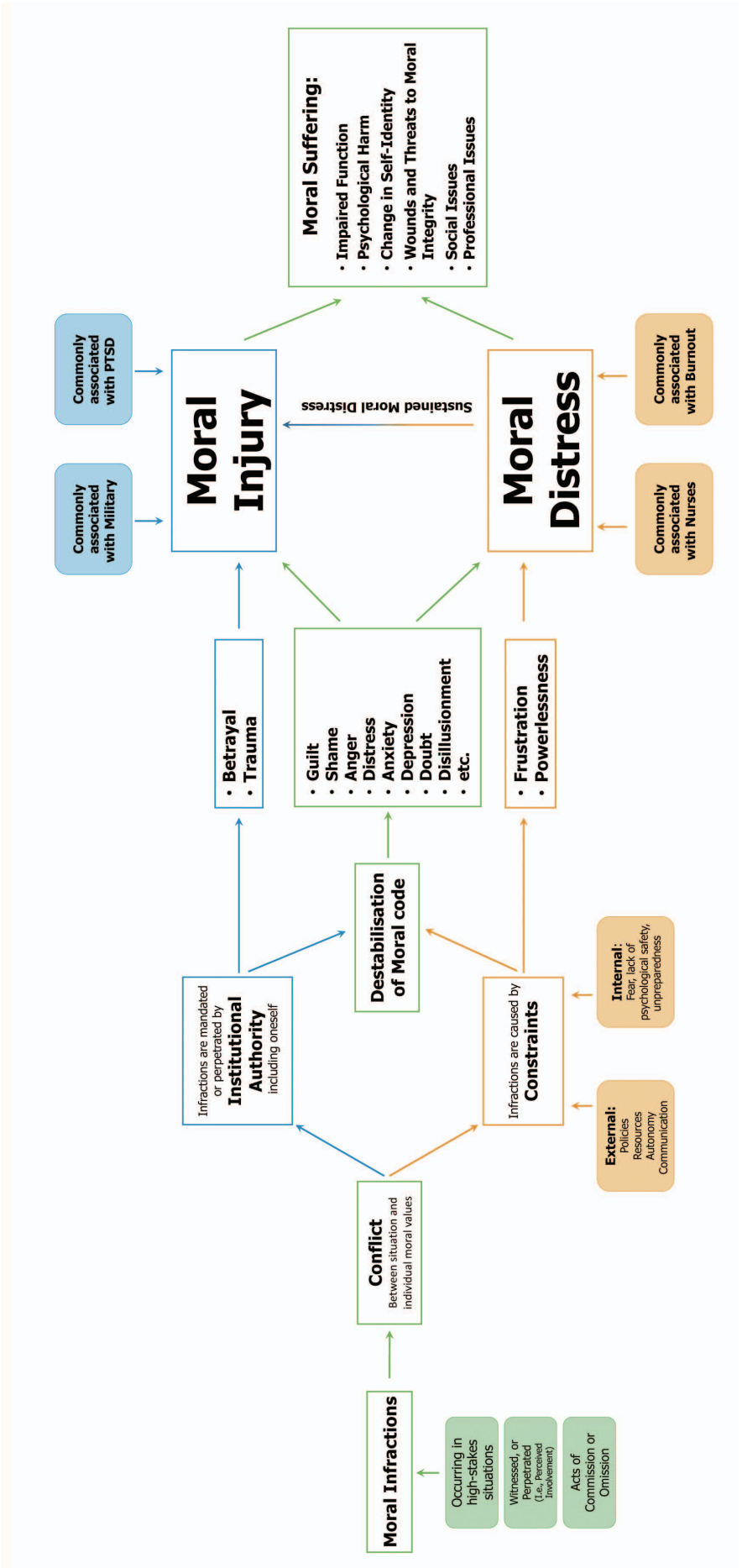

Figure 1. Conceptual Model of the Moral Suffering constructs Moral Distress and Moral Injury

Note: Created for the purposes of this paper, based on models by BMA (2021), Mänttäri-van der Kuip (2019), and Sugrue (2019). Shared Moral Suffering characteristics are in green, Moral Injury characteristics in blue, and Moral Distress characteristics in yellow.

Moral Distress

Originally theorized based on the nursing sector (Jameton, 1984), MD is the emotional and psychological distress that occurs when a professional can identify an ethically correct action, especially toward someone in their care, but is unable to take it, usually due to institutional constraints (BMA, 2021). In other words, MD is the discomfort that arises in a professional, when a mandated behavior contravenes their moral principles. This can be initial (the immediate reaction to moral conflict), or reactive (persistent and lingering distress after the event) (Jameton, 1993). MD can be due to systemic issues such as lack of funding, resources, training, staff, or time, as well as to related organizational policies or conflicting interests, that make it impossible for the professional to provide the care that meets their moral standards. This construct has been associated with inward- (i.e., mental health and self-identity), as well as outward harm (i.e., avoiding interactions with patients, quitting one's job, and abandoning one's moral values) (Hamric, 2012; Sugrue, 2019). The COVID-19 pandemic has been linked to an intensification of MD prevalence and symptoms (Lake et al., 2021; Silverman et al., 2021). MD has been commonly linked with burnout and the two have been found to be strongly associated (Fumis et al., 2017). MD has been proposed as a root cause of burnout (Dzeng & Wachter, 2019), or as having complex interplay with certain risk factors of burnout, such as home-work imbalance (Kok et al., 2021), but a full scope of the relationship is still unclear.

Several nurse studies sought to identify patterns and causes of MD. Some relevant themes are ambivalence toward the appropriateness and prioritization of care, distress derived from others' ethical insensitivity, limited autonomy, and conflicts with physicians and policies (Atli Özbaş et al., 2021; Choe et al., 2015). Potential sources of MD include the loss of individual decision-making power, the lack of explicit ethical framework in guidelines, and lack of organization-wide forums to discuss ethical concerns (Prompahakul et al., 2021; Thomas et al., 2022). Bullying, lack of communication and collaboration, as well as concerns over quality, quantity, and consistency of care provided, were identified as factors of MD (Henrich et al., 2016; Vincent et al., 2020), whereas frustration was identified as the most common emotion associated with MD (Henrich et al., 2017; Rodney, 2017). Anger, guilt, and powerlessness were also associated with the construct, as well as a perception of negative impact on patient care, and frequent thoughts about quitting (De Brasi et al., 2021; Wiegand & Funk, 2012). MD's protective factors include longer tenure, collaborative and supportive working environments, cooperation between colleagues and organizations, as well as being based in community rather than hospital settings (Hancock et al., 2020; Webber et al., 2021).

Few studies examined MD outside of medical and nursing professions, and fewer still with quantitative methods. This gap accounts for the absence of a validated measure of MD relevant or adaptable to SC professions (Mänttäri-van der Kuip, 2015). For example, the Moral Distress Scale (MDS), MDS-Revised (Epstein et al., 2019), and the Moral Distress Appraisal Scale (Baele & Fontaine, 2021) are specific to the healthcare population both in items and validation, whereas the Questionnaire of Moral Distress Among Long-Term Care Social Workers (Lev & Ayalon, 2016) is specific to care-home workers. One study of social welfare workers in Finland assessed MD through reported experiences of impaired mental wellbeing at work and of two independent question-items, which were not part of a formal scale; this study found that 11.0% of participants were experiencing MD based on all three criteria and 30.2% of the variance was accounted for by the external constraint "perceived insufficient resources" (Mänttäri-van der Kuip, 2015, p. 92). Another quantitative study on MD in child welfare caseworkers in the US measured MD using two items of the role conflict subscale from the 60-item, 15-dimension CRISO Psychological Climate Questionnaire (Gagnon et al., 2009) as well as internal constraints (i.e., psychological safety and preparedness), external constraints (i.e., time pressure and job stress), and burnout (He et al., 2021). Over 60% of participants reported experiencing one or both MD conditions. Both studies' findings support the hypothesis that a) SCWs experience MD, b) external constraints account for much of the distress, and c) there is a need for validated measures of MD in SCWs.

Moral Injury

MI can be defined as the functional and psychological impairment arising from experiences of moral dissonance (Shay, 1995), as well as resulting from sustained MD (BMA, 2021). As a form of trauma, MI can arise when a) moral violations are perpetrated (commission or omission), b) by figures of authority (including oneself) c) in high stakes situations; e.g., combat resulting in civilian casualties, being involved in shootings, or killing enemy combatants (Shay, 1995). Such instances of commission, omission, or witnessing, are known as PMIEs. MI can manifest itself through feelings of shame, guilt, anger, disgust, and betrayal (i.e., feeling betrayed by authority figures, institutions, colleagues, etc.), destabilizing an individual's mental health and moral compass (Shay, 2014).

MI was originally coined in reference to military veterans when it became clear that the PTSD diagnosis could not account for the moral components of veterans' distress, which was also resistant to any type of PTSD treatment (Williamson et al., 2021). MI has often been proposed as a predictor of PTSD (Jordan et al., 2017), and both have been consistently found to coexist in individuals who simultaneously struggle with trauma/mortality and with reconciling their moral core with lived experiences (Ferrajão & Oliveira, 2014; Litz et al., 2009; Spence et al., 2014). Most empirical studies focus on veterans, where PMIEs have been linked to current psychopathology and suicidality, with high prevalence in the dimensions of betrayal and witnessed transgressions (Wisco et al., 2017). Transgressions by the self are significantly less reported and have been especially associated with mental disorders and suicidal ideation, whereas the dimension of betrayal has been associated with suicide attempts.

On the other hand, MI can occur independently of traumatic experiences and has been associated with occupations outside of the military (Williamson et al., 2018); for example, researchers found a high prevalence of MI in health care workers after the COVID-19 pandemic, and particularly in nurses (Rushton, Nelson, et al., 2022; Rushton, Thomas, et al. 2022). MI has also been specifically associated with the SC sector (Dombo et al., 2013). FSCWs operate in morally complex settings (e.g., child protection, jails, hospitals, etc.) where they are likely to be exposed to or commit PMIEs and, if unaddressed, such experiences may lead to reduced effectiveness and burnout (Haight et al., 2016). While MI, like MD, has rarely been examined in this population, one study of child protective services professionals found participants to have comparable MI prevalence to that of military populations (Haight et al., 2017). Here, PMIEs were rooted in some of the same external constraints associated with MD: insufficient resources, unfair policies, an adversarial system, and poor service quality. On one hand, this suggests that for FSCWs, both MD and MI find some of their roots in external constraints to caring for service users and being exposed to morally complex situations; on the other, it supports the view of MI as a form of sustained MD (BMA, 2021), and of MI and MD as dimensions of the same construct (MS) (Mänttäri-van der Kuip, 2020).

In this study, we focused on gaining a better understanding of 1) the prevalence of MI and MD among FSCWs, 2) whether a correlation exists between MI and MD, and with burnout, and 3) whether MI and MD can be accounted for by internal/external constraints. The results reported in this study may help shed light on issues faced by FSCWs in the UK and factors underlining psychoemotional distress in this population. To the best of the authors' knowledge, this is the first investigation examining both MD and MI in FSCWs in the UK.

Methods

The study used a quantitative approach via online survey with a cross-sectional correlational design and was approved by the University's Research Ethics Committee (Ethics Approval Number: 2003940_220127).

Participants and Data-Collection

One hundred and nineteen healthy, UK-based FSCWs completed the survey. Participants were predominantly female (91.6%), with the average age at 37.8 (*SD* = 11.54), from various SC professions, and with a wide range of tenure (years in the field). Due to convenience, much of the recruitment was done in Violence Against Women and Girls (VAWG) organizations, supporting survivors of gender-based violence and abuse. A summary of descriptive statistics can be found in Table 1. Inclusion criteria included

Table 1. Frequency Distribution for Gender, Title, and Tenure

Sample Characteristics	*n*	%
Gender		
Female	109	91.6
Male	5	4.2
Non-Binary	5	4.2
Job Title		
Advocate	13	10.9
Social Worker	14	11.8
IDVA	19	15.9
ISVA	4	3.4
DAPA	4	3.4
Refuge Worker	7	5.9
Youth Worker	3	2.5
Case Worker	12	10.1
Other Frontline worker	43	36.1
Tenure		
1–2 years	32	27.4
3–5 years	21	17.9
6–10 years	27	23.1
11–19 years	19	16.3
20+ years	18	15.3

Note. Demographic questions were formulated based on ONS, 2016.
IDVA (Independent Domestic Violence Advocate), ISVA (Independent Sexual Violence Advocate), DAPA (Domestic Abuse Prevention Advocate) are professions in the Violence Against Women and Girls (VAWG) sector.

being employed in SC, for at least one year within the last six months, with frontline status (i.e., interacting with service users daily as part of their job). While backgrounds and tasks may vary across the population, for the purposes of this paper, we examined FSCWs as a unitary population characterized by the features described above, while individual professions and service user groups did not factor in the analysis.

We used convenience sampling, and recruited participants through professional networks, as well as through SCWs networks on social media. Sample size parameters were calculated through a priori G*Power analysis. With a medium effect size of .15, α at .05, and .80 power, the minimum sample size was 103 participants (Gatsonis & Sampson, 1989).

Participants completed a one-time 10–15-minute online survey, following institutional and BPS ethical guidelines (Oates et al., 2021).

Measures

Due to the absence of relevant validated measures of MD at the time of this study, measures for MD as well as all internal and external constraints were drawn from two founding studies examining SCWs with a quantitative design: Mänttäri-van der Kuip (2015) and He et al. (2021).

Moral Distress

As per He et al.'s (2021) methods, two items were adopted from the four-item role conflict subscale found in the Psychological Climate Questionnaire, a validated and reliable measure of organizational psychological climate (Gagnon et al., 2009). The items chosen related to two dimensions of MD; i.e., "I have to do things in my job that are against my better judgment" (MD better judgment) and "Too many rules and regulations interfere with how well I am able to do my job" (MD rules). The Cronbach's α for the role conflict subscale (four items) came to .74 (Gagnon et al., 2009). Here, the Cronbach's α coefficient for the two items was .73 and we found the inter-item correlation at 0.58, indicating good reliability (Briggs & Cheek, 1986). Two items were taken from Mänttäri-van der Kuip's (2015) methods, measuring two dimensions of MD: "I often have to work in a way that conflicts with my professional values" (MD values) and "I often feel that I am unable to do my job as well as I want to" (MD unable to perform). All four items were paired with a five-point Likert scale (5 = strongly agree, 1 = strongly disagree).

As the four items are not part of a formal scale, we conducted principal component analysis (PCA). With an excellent Kaiser-Meyer-Olkin value of .74 (Kaiser, 1974), which verified sample size adequacy, and statistical significance for Bartlett's Test of Sphericity (Bartlett, 1954), one component was extracted with an eigenvalue exceeding 1, explaining 60.2% of the variance. All items loaded strongly onto one component suggesting that they fall under the same theoretical construct and could be examined together (Pallant, 2010). We also conducted reliability analysis for a total MD score of all four items, showing good internal reliability: α = .78, and inter-item correlation at .47 (Briggs & Cheek, 1986; Pallant, 2010). Thus, the items were examined both separately and together as measuring different dimensions of MD.

Moral Injury

The Moral Injury Events Scale (MIES) (Nash et al., 2013) is a nine-item tool paired with a six-point Likert scale (6 = strongly agree, 1 = strongly disagree) measuring two dimensions of MI: perceived transgressions (witnessed and committed) and perceived betrayals in the professional context. An example item is: "I am troubled because I violated my morals by failing to do something that I felt I should have done." The MIES has been found to have good internal, discriminant, and concurrent validity (Nash et al., 2013). While originally intended for military personnel, it has been used in studies on SCWs (Haight et al., 2017) with small tweaks in language (i.e., "fellow service members" to "colleagues" and "U.S. Military" to "organization"). Both in Nash et al. (2013) and in the current study α = .90 (.90 for the transgression dimension and .85 for betrayal), indicating excellent internal consistency.

Internal Constraints: Preparedness

Preparedness for work was assessed through a three-item subscale of the 14-item Professional Development and Preparation for Work Scale, capturing perceived worker preparation (Butler Institute for Families, 2009; He et

al., 2021; Leake et al., 2021). The scale is paired with a four-point Likert scale (4 = strongly agree, 1 = strongly disagree). An example item is "When I was hired, I received training that prepared me for this job." In the Butler Institute for Families (2009), the Cronbach's α for the whole 14-item scale was .90, whereas for this study the three-item subscale had α = .62 and inter-item correlation at .36, indicating fair internal reliability.

Internal Constraints: Psychological Safety

Based on He et al. (2021), a modified three-item version of the Psychological Safety Scale (Edmondson, 1999) was used measuring dimensions of psychological safety in the working environment. Items are paired with a four-point scale (1 = very inaccurate to 4 = very accurate). An example item is "It is easy for me to ask colleagues for help." Considering the small number of items, the scale exhibited good internal consistency with α = .67 and inter-item correlation at .41 (Briggs & Cheek, 1986; Pallant, 2010).

External Constraints: Time Pressure

Based on He et al. (2021), we measured time pressure at work using a three-item subscale from the Instrument for stress-related job analysis (ISTA) (Version 6.0) (Malik, 2015; Semmer et al., 1998). The scale is paired with a 5-point Likert response scale (5 = almost always, 1 = almost never). An example item is "How often must you finish work later because of having too much to do?" The time pressure subscale is reported with good internal validity based on standardized items at α = .70. Here, α = .87, indicating excellent internal consistency.

External Constraints: Resources

Based on Mänttäri-van der Kuip (2015), the lack of resources and funding was measured with three items concerning budget constraints and insufficient resources, paired with a five-point Likert scale (5 = strongly agree, 1 = strongly disagree). An example item is: "Budget constraints affect my work." For this study α = .82.

External Constraints: Job Stress

As per He et al. (2021), the stress subscale, measuring dimensions of organizational stress in the workplace, was used from the CJ Organizational Readiness for Change Program Staff Version (TCU CJ ORC-S) (Institute of Behavioral Research, 2004). The scale was paired with a four-point scale (1 = strongly disagree, 4 = strongly agree). An example item is "The heavy workload reduces my effectiveness." For this study α=.83.

Burnout

We assessed burnout through the Copenhagen Burnout Inventory (CBI) (Kristensen et al., 2005). The inventory covers three dimensions of burnout: personal (six items), work-related (seven items), and client-related (six items). Each item is paired with a five-point scale (5 = always or to a very high degree, 1 = never/almost never or to a very low degree). An example item is "Are you exhausted in the morning at the thought of another day at work?" According to Kristensen et al. (2005), Cronbach's α coefficients stand high across the scale and its subscales (.85 – .87). Here, overall α = .94 (personal α = .93, work-related α = .86, and client-related α = .87), indicating excellent internal consistency.

Statistical Analysis

The present study aimed to examine the relationships among MI, MD, and burnout, as well as the contribution of external and internal constraints to MD and MI. To this end, we conducted prevalence, correlations, and standard multiple regression analyses (SMLR), which are reported here. Across all analyses, preliminary tests were carried out to ensure that parametric assumptions for correlation and SMLR analyses were not being violated, with no major concerns detected (Pallant, 2010); therefore, we performed parametric tests that we report below.

Results

Prevalence of MI, MD, and Burnout in FSCW

On the four items measuring MD in the context of work experiences, 72.3% of participants reported often feeling unable to do their job as well as they would want to (MD unable to perform), 61.8% of participants reported that too many rules and regulations interfere with their ability to do their job (MD rules), 52.1% reported having to do things against their better judgment (MD better judgment), and 37.0% reported having to work in a way that conflicted with their professional values (MD values). Overall, 25.4% of respondents moderately-to-strongly agreed with all four items and, when looking at total MD scores (all four items), 33.9% of participants reported moderate-to-high levels of MD.

In terms of the MIES, 33.3% of participants reported moderate-to-high levels of MI. Specifically, 56.4% of participants had moderate-to-high scores in the betrayal dimension, and 48.6% produced moderate-to-high scores in the transgression dimension, with witnessed transgressions at 60.5% and committed transgressions at 25.7%. Burnout scores (Creedy et al., 2017) are reported in Table 2.

Table 2. Severe and Moderate Burnout Distributions in Percentages

Burnout	*n*	%
Overall Burnout		
High	29	25.4
Moderate	45	39.5
Personal Burnout		
High	55	46.2
Moderate	40	33.6
Work Burnout		
High	41	34.7
Moderate	51	43.3
Client Burnout		
High	11	9.6
Moderate	28	24.3

Examination of Interrelationships Between Variables

As the constructs of MI and MD have rarely been examined together and within this population, we examined several relationships using Pearson product-moment correlation coefficient. MI, MD, and burnout correlations, including subscales, are reported in Table 3. While not all examined relationships were strong, all were positive and significant.

The Impact of Internal and External Constraints on Moral Distress

To understand how internal and external constraints predicted MD, a SMLR was conducted (Uyanık & Güler, 2013). Total MD was used as a dependent variable. The model was found to explain 35.3% of the variance (using adjusted R square due to the sample size as per Pallant, 2010) and constraints were significant predictors of MD with $F(5, 103) = 12.77$, $p < .001$. We report summary statistics in Table 4. Once burnout was added as a predictor, the model explained 37.1% of the MD variance $F(6, 101) = 11.50$, $p < .001$. Here, time ($\beta = .26$, $p = .013$), burnout ($\beta = .23$, $p = .050$), and preparedness ($\beta = -.19$, $p = .049$), were all significant predictors.

The Impact of Internal and External Constraints on Moral Injury

To understand whether and how internal and external constraints predicted MI scores, a SMLR was conducted. Results of the regression indicated that the model explained 30.1% of the variance (again, using adjusted R square) and that the model also explained a significant amount of MI variance, $F(5, 90) = 9.43$, $p < .001$. We report summary statistics in Table 5. Once we added burnout to the model as a predictor, the model explained 35.0% of the variance, and served as a significant predictor of MI scores, $F(6, 89) = 9.53$, $p < .001$. Here, only burnout ($\beta = .32$, $p = .010$) and preparedness ($\beta = -.22$, $p = .036$) made significant contributions to the model.

Table 3. Interrelationships Between MD, MI, and Burnout

Variables	*M*	*SD*	Minimum	Maximum	1	2	3	4	5	6	7	8	9	10	11	12	13
1. MD (total)	13.24	3.97	4	20													
2. MD (better judgement)	3.29	1.23	1	5	.79**												
3. MD (rules)	3.47	1.31	1	5	.80**	.58**											
4. MD (values)	2.76	1.32	1	5	.74**	.45**	.36**										
5. MD (unable)	3.74	1.25	1	5	.78**	.44**	.53**	.45**									
6. MI (total)	28.44	11.97	9	54	.68**	.54**	.43**	.55**	.59**								
7. MI (transgressions)	17.93	8.24	6	36	.62**	.49**	.37**	.53**	.49**	.93**							
8. MI (betrayal)	10.54	5.15	3	18	.59**	.44**	.40**	.44**	.55**	.82**	.55**						
9. MI (transgressions witnessed)	7.92	3.34	2	12	.44**	.32**	.29**	.43**	.31**	.79**	.78**	.54**					
10. MI (transgressions committed)	10.00	5.99	4	24	.57**	.45**	.33**	.47**	.48**	.84**	.93**	.46**	.50**				
11. Burnout (total)	57.80	19.20	14	96	.52**	.36**	.39**	.41**	.46**	.56**	.46**	.54**	.36**	.44**			
12. Burnout (personal)	69.68	23.05	13	100	.54**	.38**	.43**	.41**	.47**	.48**	.36**	.50**	.25**	.34**	.90**		
13. Burnout (work)	65.25	20.87	17	100	.53**	.35**	.42**	.42**	.46**	.47**	.36**	.49**	.27**	.34**	.93**	.89**	
14. Burnout (client)	40.90	21.51	4	93	.34**	.27**	.21*	.28**	.30**	.52**	.48**	.43**	.38**	.46**	.81**	.51**	.58**

Table 4. Model Summary for MD (total) and Constraints

Model	β	*t*	*p*
1. Preparedness	-.22	-2.24	.027
2. Psychological Safety	-.02	-.16	.871
3. Time	.26	2.54	.013
4. Resources	-.08	-.98	.332
5. Stress	.32	2.92	.004

Table 5. Model Summary for MI and Constraints

Model	β	*t*	*p*
1. Preparedness	-.26	-2.41	.018
2. Psychological Safety	-.19	-1.88	.063
3. Time	.02	.21	.832
4. Resources	.04	.42	.673
5. Stress	.26	2.18	.032

Discussion

This study aimed to examine the prevalence and interrelationships between MS constructs of MD and MI, their relationships with burnout in FSCWs, as well as the role of internal and external constraints in predicting MS. A secondary aim was to increase the awareness of MS as affecting both workers' wellbeing and service provision (Epstein & Hamric, 2009; Williams et al., 2020), and of FSCWs as a unitary population liable to experience the same MH issues as other helping professions (Gray-Stanley & Muramatsu, 2011), as well as to challenge burnout as the main paradigm of work-related distress in such sectors (Dean et al., 2019).

Results showed concerning amounts of worker distress with over 1/3 of the sample reporting moderate-to-high levels of MD and MI, and 64.9% of participants reporting moderate-to-high levels of overall burnout. The three constructs of MD, MI and burnout had significant medium-to-strong positive relationships. Interrelationships between construct domains ranged from weak to strong and were all positive and significant. Stress, lack of preparedness and burnout were significant predictors of both MD and MI, and time constraint also served as a significant predictor of MD. In general, constraints and burnout explained 37.1% of the variance in MD and 35.0% in MI, supporting this study's hypothesis.

In this study, prevalence of MD stands significantly higher than the 11.0% found by Mänttäri-van der Kuip (2015). However, part of this difference may be accounted for by the fact that a) this study was conducted with somewhat different measures, b) the previous study was conducted in Finland, and system specifics are inherently connected to MS's mandates and constraints, and c) COVID-19 occurred between the two studies, likely causing a significant increase in MS (BMA, 2021). The MD dimensions of inability to perform, too many rules, and having to work against one's better judgment were present in over half the sample, whereas over a third reported sometimes having to work against professional values.

MI prevalence was comparable with an examination of child protection workers (Haight et al., 2017), as well as with results in military populations (Bryan et al., 2016), implicating MI as an equally relevant issue to FSCWs. Here, the dimensions of betrayal and witnessed transgressions were especially frequent. On the other hand, committed transgressions were less reported (25.7%), which also remains consistent with previous results (Haight et al., 2017). This may be due to SCWs being more likely to be exposed to others' transgressions (e.g., child/ elder/ intimate partner abuse), and/or to a resistance to recognizing one's own transgressions. This warrants further exploration, as MS may come with its own dissonance-resolution strategies to reduce internal moral conflict. Understanding what these are and whether they act as a protective or exacerbating factor may provide key insights into MS's features and treatments.

Overall burnout appeared more prevalent than in comparable studies (Gómez-García et al., 2019), although, here too, the occurrence of COVID-19 and the post-pandemic context are likely to have had a significant effect. While over half of participants reported personal and work-related burnout, client-related burnout was reported by less than a third. This is an interesting result, as the defining feature of FSCW is direct contact with clients, so one might have expected this domain to be a more significant source of burnout. This factor may support MS as a crucial concern in FSCWs, where client-work and consequent exposure to others' suffering may cause less distress than the practicalities and institutional constraints of the profession (Parry, 2021). Client burnout exhibited a weak relationship with MD but a moderate one with MI, specifically the betrayal domain, which contributes to the previous explanation as it may imply that workers who feel more betrayed by organizations and leaders have a harder time working with clients. This is also in line with findings linking higher feelings of betrayal with increases in mental distress and PTSD symptoms (Park et al., 2023).

The relationships between these constructs should be further examined when aiming to understand the nature of work-related distress in helping professions. What appears clear is that, as previous articles have argued,

burnout alone is not sufficient to explain mental health challenges in these populations (Dean et al., 2019; Parry, 2021). On the other hand, treating MI and MD as fully distinct constructs and relating them to specific professions seems to offer restricted information regarding the conceptualization and experience of MS. In fact, the strong positive correlation between MI and MD is an important finding, which, combined with both constructs being significantly predicted by external and internal constraints, supports the view of MS as a unitary model of work-related distress (Mänttäri-van der Kuip, 2020; Sugrue, 2019).

The main predictors of MS we found to be external constraint stress (i.e., heavy workload, pressure, and frustration), internal constraint preparedness (i.e., feeling that one did not receive enough information and training), burnout, and time constraints. While 66.0% of the sample reported medium-to-high levels of insufficient resources (M*(SD)* = 13.08*(2.43)*), contrary to previous findings (Mänttäri-van der Kuip, 2015) and this study's hypothesis, this was not a significant predictor of either MD or MI. So, while lack of resources remained an important concern for most of the sample, it did not seem to make a significant contribution to MS. This unexpected outcome could possibly be due to the use of general questions, rather than ones discussing resources in the context of FSCW; for example, whether workers feel that the lack of resources affects their ability to provide high standards of support to clients.

In general, these results support the theory of MS as a multidimensional construct of worker distress (Mänttäri-van der Kuip, 2020), with constraints and burnout making a significant contribution. Moreover, this study identified FSCWs as a discrete population, facing unique moral challenges, and reporting comparable levels of MS to those seen in health or military professionals. However, from a theoretical viewpoint, the lack of consensus on how MS is defined, and it being viewed as job-specific, limits research rigor and the ability to generalize results from other sectors. A great deal more research is necessary to understand this construct, including further dimensions of MS, comorbidities, constraints and/or mandates, and interactions among these, as well as protective factors and treatment (Sugrue, 2019). Along the same lines, a more in-depth examination of constraints is needed, including the "external" and "internal" characterization, as, for example, preparedness and psychological safety, currently defined as internal constraints (He et al., 2021), are still somewhat anchored to external causes; e.g., an organization's responsibility to adequately train and prepare staff, or to create a safe climate for employees to seek help and guidance. In terms of protective factors and interventions, the recent theorization of the concept of moral resilience (MR) as "the capacity of an individual to preserve or restore integrity in response to moral adversity", was found to be a valuable protective factor for MS and led to the development of interventions focusing on building MR (Rushton, 2023; Spilg et al., 2022). Further research into MR, MR-based interventions, and its applications, including in SC, may lead to important results.

Strengths and Limitations

Quantitative examinations of MS and examinations of FSCWs are sparse, and virtually nonexistent in the UK, which, combined with the paper's results, make this a novel contribution to the study of work- and caring-related mental health concerns.

Limitations of this study included the sample size, sampling method, insider research, and the lack of a validated measure of MD, which warrant caution in interpreting results. While a larger sample would have allowed for a closer approximation of the population, this sample was amply within a priori G*Power analysis and no major concerns arose in analysis assumptions. While convenience sampling presents generalizability issues and this should be considered when examining results (Jager et al., 2017), practical constraints, the wide scope of recruitment, the specificity of inclusion criteria, and SC being a sparsely examined population justify the sampling method and speak to the value of the results. Along the same lines, sample size and risks of power biases prevented sample homogenization by gender. However, the analysis did not yield any major outliers and, while gender differences have been found in moral domains, the evidence of significant gender differences in MS, particularly in the SC context, still remains lacking (Maguen et al., 2020; O'Connell, 2014). The issue of insider research was mitigated by employing an anonymous online survey, reducing researcher/participant interaction and biases, and avoiding the collection of any identifiable data (Evans & Mathur, 2005). Finally, while there are no validated MD tools appropriate for FSCWs and no unitary MS tools, the measures for MD used here were based on previous research and had good internal reliability. The MIES had previously been used with SCWs and possessed excellent internal reliability (Haight et al., 2017; He et al., 2021; Mänttäri-van der Kuip, 2020).

Conclusions, Implications and Future Directions

Given the relationship between MS, burnout (Thibodeau et al., 2023), and mental health disorders (Williamson et al., 2018), as well as the very high rate of work-related mental health concerns in the SC sector (Ondrejková & Halamová, 2022), further research is required to fully understand the weight of the moral dimension on mental health. Considering the preceding, however, the concept of self-care (the collection of practices to promote one's biopsychosocial wellbeing), which has seen a steep rise in popularity since the start of COVID-19 (Miller & Reddin Cassar, 2021), may seem acutely insufficient to fully address the roots and ramifications of work-related distress in helping professions (Dean et al., 2019). While self-care has proven to be a beneficial practice, maintaining healthy sleep, dietary, exercise, and socialization habits, while also cultivating mindfulness and professional growth (Posluns & Gall, 2020), is not only made exceedingly difficult by the same stress, overwork and time constraints that contribute to MS, but also burdens the individual, rather than institutions, with the responsibility of caring for themselves in the face of problems that may be more systemic than personal.

Future research should also focus on what individual characteristics increase the probability of MS. For example, examining the impact of socio-demographic factors, including gender and background, and work-related factors, including title and tenure, across different populations at risk of MS, would contribute to a unitary characterization of the construct. Moreover, there may be a relationship between MS and public service motivation (PSM); i.e., the attribute of many helping professionals that explains the inclination to serve the public and seek intrinsic (e.g., work-satisfaction) rather than extrinsic (e.g., monetary) rewards (Ritz et al., 2016). As individuals with the PSM attribute are likely to choose service/helping professions (Belrhiti et al., 2019), they may also be more likely to struggle with the moral dissonance derived from being unable to provide high standards of care.

From a methodological standpoint, future research should focus on a validated and reliable measure of MD, adaptable to assess different populations, and a complete measure of MS, integrating the construct's dimensions (Mänttäri-van der Kuip, 2020). Along the same lines, coupled with or independently of these measures, a need exists for a unitary tool assessing the presence of internal and external constraints, including, but not limited to, those examined here. Qualitative research on populations at risk of MS could provide insight into field-specific mandates and constraints, which would allow for more reliable results and for researchers not having to dissect scales and subscales to identify MS predictors and problem areas in the workplace. Moreover, mixed methods and longitudinal studies would help provide insights into the realities of MS across fields and the factors that may be influencing it over time (Parry, 2021). This is especially important in the wake of COVID-19 and in the post-pandemic context, when the increased pressures on FSCWs, decreased resources, and overwhelmed institutions may foster the surge of each MS domain discussed here, including feeling betrayed by leaders and organizations, witnessing (and committing) infractions of care standards, feeling unprepared in the face of unprecedented challenges, and unable to work, or obligated to work in a way that conflicts with one's better judgment and values. The conceptualization of MS and this study's results suggest the need for a systemic shift in the way governing bodies, organizations, and individual teams view and support helping professionals. Burnout and MS were shown to be significantly prevalent and linked to a wide range of mental health issues that are costly to individuals, organizations, and society (Hanna, 2004; Parsonage & Saini, 2017; Pehlivan & Güner, 2018). Appropriately funding and remunerating the SC sector could help reduce turnover, workload, and the pressure on individual workers, and could significantly improve access and service provision, thereby also reducing the occurrence of PMIEs (Idriss et al., 2021).

In general, reducing the high expectations and culture of self-sacrifice placed on helping professionals and focusing on fixing systemic problems (i.e., constraints) could address much of the roots of work-related distress. Acknowledging the PMIEs inherent to specific fields and providing appropriate resources and organization-wide forums for workers to address these collectively (Thomas et al., 2022), may also help FSCWs feel empowered, come to terms with moral challenges, and foster collaborative environments which may help build moral resilience (Webber et al., 2021). Taking measures to reduce constraints on a systemic level by increasing funding and changing policies, while also providing spaces to address moral challenges and fostering moral resilience in workers through forums and training, could go a long way toward addressing MS.

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Author contribution
Sara HARPER: conceptualization, design, methodology, investigation, project administration, data management, formal analysis, interpretation, writing original draft.
Anatoli KARYPIDOU: design, methodology, project administration, formal analysis, supervision, writing review and editing.

Declaration of interest statement
Sara Harper is an employee of a London-based VAWG organization. Any potential risks attached to insider research were addressed during Ethical Approval and at all stages of research. The authors have no conflicts of interest to declare. All co-authors have seen and agree with the contents of the manuscript and there is no financial interest to report. We certify that the submission is original work and is not under review at any other publication.

Ethical statement
This manuscript is the authors' original work.
All participants engaged in the research voluntarily and anonymously.
Their data are stored in coded materials and databases without personal data.
The studies involving human participants were reviewed and approved by the Research Ethics Committee of Birmingham Newman University on January 27th 2022, with Ethics Approval Number: 2003940_220127.

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Datasets presented in this article are available from the corresponding author upon reasonable request.

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References

Ashcroft, R., Sur, D., Greenblatt, A., & Donahue, P. (2022). The Impact of the COVID-19 pandemic on social workers at the frontline: A survey of Canadian social workers. *The British Journal of Social Work, 52* (3), 1724–1746. https://doi.org/10.1093/bjsw/bcab158

Atli Özbaş, A., Kovanci, M. S., & Köken, A. H. (2021). Moral distress in oncology nurses: A qualitative study. *European Journal of Oncology Nursing*, *54*, Article 102038. https://doi.org/10.1016/j.ejon.2021.102038

Baele, C. A., & Fontaine, J. R. J. (2021). The Moral Distress-Appraisal Scale: Scale development and validation study. *Journal of Advanced Nursing, 77*(10), 4120–4130. https://doi.org/10.1111/jan.14923

Bartlett, M. S. (1954). A note on the multiplying factors for various χ^2 approximations. *Journal of the Royal Statistical Society: Series B (Methodological)*, *16*(2), 296–298. https://doi.org/10.1111/j.2517-6161.1954.tb00174.x

Belrhiti, Z., Van Damme, W., Belalia, A., & Marchal, B. (2019). Does public service motivation matter in Moroccan public hospitals? A multiple embedded case study. *International Journal for Equity in Health*, *18*, Article 160. https://doi.org/10.1186/s12939-019-1053-8

BMA. (2021). *Moral distress and moral injury Recognising and tackling it for UK doctors*. https://www.bma.org.uk/media/4209/bma-moral-distress-injury-survey-report-june-2021.pdf

Braxton, J. M., Busse, E. M., & Rushton, C. H. (2021). Mapping the terrain of moral suffering. *Perspectives in Biology and Medicine, 64*(2), 235–245. https://doi.org/10.1353/pbm.0.0029

Briggs, S. R., & Cheek, J. M. (1986). The role of factor analysis in the development and evaluation of personality scales. *Journal of Personality*, *54*(1), 106–148. https://doi.org/10.1111/j.1467-6494.1986.tb00391.x

Bryan, C. J., Bryan, A. O., Anestis, M. D., Anestis, J. C., Green, B. A., Etienne, N., Morrow, C. E., & Ray-Sannerud, B. (2016). Measuring moral injury: Psychometric properties

of the Moral Injury Events Scale in two military samples. *Assessment*, *23*(5), 557–570. https://doi.org/10.1177/1073191115590855

Butler Institute for Families. (2009). *Preparedness for work* [Unpublished measure]. University of Denver.

Campbell, S. M., Ulrich, C. M., & Grady, C. (2016). A broader understanding of moral distress. *The American Journal of Bioethics*, *16*(12), 2–9. https://doi.org/10.1080/15265161.2016.1239782

Čartolovni, A., Stolt, M., Scott, P. A., & Suhonen, R. (2021). Moral injury in healthcare professionals: A scoping review and discussion. *Nursing Ethics*, *28*(5), 590–602. https://doi.org/10.1177/0969733020966776

Choe, K., Kang, Y., & Park, Y. (2015). Moral distress in critical care nurses: A phenomenological study. *Journal of Advanced Nursing*, *71*(7), 1684–1693. https://doi.org/10.1111/jan.12638

Creedy, D. K., Sidebotham, M., Gamble, J., Pallant, J., & Fenwick, J. (2017). Prevalence of burnout, depression, anxiety and stress in Australian midwives: A cross-sectional survey. *BMC Pregnancy and Childbirth*, *17*, Article 13. https://doi.org/10.1186/s12884-016-1212-5

Dean, W., Talbot, S., & Dean, A. (2019). Reframing clinician distress: Moral injury not burnout. *Federal Practitioner*, *36*(9), 400–402.

De Brasi, E. L., Giannetta, N., Ercolani, S., Gandini, E. L. M., Moranda, D., Villa, G., & Manara, D. F. (2021). Nurses' moral distress in end-of-life care: A qualitative study. *Nursing Ethics*, *28*(5), 614–627. https://doi.org/10.1177/0969733020964859

Deschenes, S., Gagnon, M., Park, T., & Kunyk, D. (2020). Moral distress: A concept clarification. *Nursing Ethics*, *27*(4), 1127–1146. https://doi.org/10.1177/0969733020909523

Dombo, E. A., Gray, C., & Early, B. P. (2013). The trauma of moral injury: Beyond the battlefield. *Journal of Religion & Spirituality in Social Work: Social Thought*, *32*(3), 197–210. https://doi.org/10.1080/15426432.2013.801732

Dzeng, E., & Wachter, R. M. (2019). Ethics in conflict: Moral distress as a root cause of burnout. *Journal of General Internal Medicine, 35,* 409–411. https://doi.org/10.1007/s11606-019-05505-6

Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly*, *44*(2), 350–383. https://doi.org/10.2307/2666999

Epstein, E. G., & Hamric, A. B. (2009). Moral distress, moral residue, and the crescendo effect. *The Journal of Clinical Ethics*, *20*(4), 330–342. https://pubmed.ncbi.nlm.nih.gov/20120853/

Epstein, E. G., Whitehead, P. B., Prompahakul, C., Thacker, L. R., & Hamric, A. B. (2019). Enhancing understanding of moral distress: The measure of moral distress for health care professionals. *AJOB Empirical Bioethics*, *10*(2), 113–124. https://doi.org/10.1080/23294515.2019.1586008

Evans, J. R., & Mathur, A. (2005). The value of online surveys. *Internet Research*, *15*(2), 195–219. https://doi.org/10.1108/10662240510590360

Ferrajão, P. C., & Oliveira, R. A. (2014). Self-awareness of mental states, self-integration of personal schemas, perceived social support, posttraumatic and depression levels, and moral injury: A mixed-method study among Portuguese war veterans. *Traumatology*, *20*(4), 277–285. https://doi.org/10.1037/trm0000016

Foster, D. (2024). *Adult social care workforce in England*. House of Commons Library. https://researchbriefings.files.parliament.uk/documents/CBP-9615/CBP-9615.pdf

Fourie, C. (2017). Who is experiencing what kind of moral distress? Distinctions for moving from a narrow to a broad definition of moral distress. *The AMA Journal of Ethic*, *19*(6), 578–584. https://doi.org/10.1001/journalofethics.2017.19.6.nlit1-1706

Fumis, R. R. L., Junqueira Amarante, G. A., de Fátima Nascimento, A., & Vieira Junior, J. M. (2017). Moral distress and its contribution to the development of burnout syndrome among critical care providers. *Annals of Intensive Care*, *7*, Article 71. https://doi.org/10.1186/s13613-017-0293-2

Gabel, S. (2013). Demoralization in health professional practice: Development, amelioration, and implications for continuing education. *Journal of Continuing Education in the Health Professions*, *33*(2), 118–126. https://doi.org/10.1002/chp.21175

Gagnon, S., Paquet, M., Courcy, F., & Parker, C. P. (2009). Measurement and management of work climate: Cross-validation of the CRISO Psychological Climate Questionnaire. *Healthcare Management Forum*, *22*(1), 57–65. https://doi.org/10.1016/S0840-4704(10)60294-3

Gatsonis, C., & Sampson, A. R. (1989). Multiple correlation: Exact power and sample size calculations. *Psychological Bulletin*, *106*(3), 516–524. https://doi.org/10.1037/0033-2909.106.3.516

Godshall, M. (2021). Coping with moral distress during COVID-19. *Nursing*, *51*(2), 55–58. https://doi.org/10.1097/01.nurse.0000731840.43661.99

Gómez-García, R., Alonso-Sangregorio, M., & Llamazares-Sánchez, M. L. (2019). Burnout in social workers and sociodemographic factors. *Journal of Social Work*, *20*(4), 463–482. https://doi.org/10.1177/1468017319837886

Gray-Stanley, J. A., & Muramatsu, N. (2011). Work stress, burnout, and social and personal resources among direct care workers. *Research in Developmental Disabilities*, *32*(3), 1065–1074. https://doi.org/10.1016/j.ridd.2011.01.025

Greason, M. (2020). Ethical reasoning and moral distress in social care among long-term care staff. *Journal of Bioethical Inquiry, 17,* 283–295. https://doi.org/10.1007/s11673-020-09974-x

Grimell, J., & Nilsson, S. (2020). An advanced perspective on moral challenges and their health-related outcomes through an integration of the moral distress and moral injury theories. *Military Psychology*, *39*(6), 380–388. https://doi.org/10.1080/08995605.2020.1794478

Haight, W., Sugrue, E. P., & Calhoun, M. (2017). Moral injury among Child Protection Professionals: Implications for the ethical treatment and retention of workers. *Children and Youth Services Review*, *82*, 27–41. https://doi.org/10.1016/j.childyouth.2017.08.030

Haight, W., Sugrue, E., Calhoun, M., & Black, J. (2016). A scoping study of moral injury: Identifying directions for social work research. *Children and Youth Services Review*, *70*, 190–200. https://doi.org/10.1016/j.childyouth.2016.09.026

Hall, N. A., Everson, A. T., Billingsley, M. R., & Miller, M. B. (2021). Moral injury, mental health, and behavioral health outcomes: A systematic review of the literature. *Clinical Psychology & Psychotherapy*, *29*(1), 92–110. https://doi.org/10.1002/cpp.2607

Hamric, A. B. (2012). Empirical research on moral distress: Issues, challenges, and opportunities. *HEC Forum*, *24*, 39–49. https://doi.org/10.1007/s10730-012-9177-x

Hancock, J., Witter, T., Comber, S., Daley, P., Thompson, K., Candow, S., Follett, G., Somers, W., Collins, C., White, J., & Kits, O. (2020). Understanding burnout and moral distress to build resilience: A qualitative study of an interprofessional intensive care unit team. *Canadian Journal of Anesthesia*, *67*, 1542–1548. https://doi.org/10.1007/s12630-020-01789-z

Hanna, D. R. (2004). Moral distress: The state of the science. *Research and Theory for Nursing Practice*, *18*(1), 73–93. https://doi.org/10.1891/rtnp.18.1.73.28054

He, A. S., Lizano, E. L., & Stahlschmidt, M. J. (2021). When doing the right thing feels wrong: Moral distress among child welfare caseworkers. *Children and Youth Services Review*, *122*, Article 105914. https://doi.org/10.1016/j.childyouth.2020.105914

Henrich, N. J., Dodek, P. M., Alden, L., Keenan, S. P., Reynolds, S., & Rodney, P. (2016). Causes of moral distress in the intensive care unit: A qualitative study. *Journal of Critical Care*, *35*, 57–62. https://doi.org/10.1016/j.jcrc.2016.04.033

Henrich, N. J., Dodek, P. M., Gladstone, E., Alden, L., Keenan, S. P., Reynolds, S., & Rodney, P. (2017). Consequences of moral distress in the intensive care unit: A qualitative study. *American Journal of Critical Care*, *26*(4), e48–e57. https://doi.org/10.4037/ajcc2017786

Hutmacher, F. (2021). Putting stress in historical context: Why it is important that being stressed out was not a way to be a person 2,000 years ago. *Frontiers in Psychology*, *12,* Article 539799. https://doi.org/10.3389/fpsyg.2021.539799

Idriss, O., Tallack, C., Shembavnekar, N., & Carter, M. (2021, February 11). *Social care funding gap.* The Health Foundation. https://www.health.org.uk/news-and-comment/charts-and-infographics/REAL-social-care-funding-gap

Institute of Behavioral Research. (2004). *TCU CJ Organizational Readiness for Change program staff version (TCU CJ ORC-S).* Texas Christian University, Institute of Behavioral Research.

Jager, J., Putnick, D. L., & Bornstein, M. H. (2017). More than just convenient: The scientific merits of homogeneous convenience samples. *Monographs of the Society for Research in Child Development*, *82*(2), 13–30. https://doi.org/10.1111/mono.12296

Jameton, A. L. (1984). *Nursing practice: The ethical issues.* Prentice Hall.

Jameton, A. (1993). Dilemmas of moral distress: Moral responsibility and nursing practice. *AWHONN's Clinical Issues in Perinatal and Women's Health Nursing*, *4*(4), 542–551.

Jordan, A. H., Eisen, E., Bolton, E., Nash, W. P., & Litz, B. T. (2017). Distinguishing war-related PTSD resulting from perpetration- and betrayal-based morally injurious events. *Psychological Trauma: Theory, Research, Practice, and Policy*, *9*(6), 627–634. https://doi.org/10.1037/tra0000249

Kabir, Z. N., Boström, A.-M., & Konradsen, H. (2020). In conversation with a frontline worker in a care home in Sweden during the COVID-19 pandemic. *Journal of Cross-Cultural Gerontology*, *35*, 493–500. https://doi.org/10.1007/s10823-020-09415-7

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, *39*, 31–36. https://doi.org/10.1007/bf02291575

Kinman, G., & Grant, L. (2010). Exploring stress resilience in trainee social workers: The role of emotional and social competencies. *British Journal of Social Work*, *41*(2), 261–275. https://doi.org/10.1093/bjsw/bcq088

Kristensen, T. S., Borritz, M., Villadsen, E., & Christensen, K. B. (2005). The Copenhagen burnout inventory: A new tool for the assessment of burnout. *Work & Stress*, *19*(3), 192–207. https://doi.org/10.1080/02678370500297720

Kok, N., Van Gurp, J., van der Hoeven, J. G., Fuchs, M., Hoedemaekers, C., & Zegers, M. (2021). Complex interplay between moral distress and other risk factors of burnout in ICU professionals: Findings from a cross-sectional survey study. *BMJ Quality & Safety*, *32*(4), 225–234. https://doi.org/10.1136/bmjqs-2020-012239

Kulakiewicz, A., Foster, D., Danechi, S., & Clark, H. (2022). *Children's social care workforce*. House of Commons Library. https://commonslibrary.parliament.uk/research-briefings/cdp-2022-0142/

Lake, E. T., Narva, A. M., Holland, S., Smith, J. G., Cramer, E., Rosenbaum, K. E. F., French, R., Clark, R. R. S., & Rogowski, J. A. (2021). Hospital nurses' moral distress and mental health during COVID-19. *Journal of Advanced Nursing 78*(3), 799–809. https://doi.org/10.1111/jan.15013

Leake, R., Rienks, S. L., de Guzman, A., He, A. S., & Stahlschmidt, M. J. (2021). *National Child Welfare Workforce Institute Comprehensive Organizational Health Assessment* [Dataset]. https://doi.org/10.34681/qfeh-dg67

Lederman, O., Ward, P. B., Firth, J., Maloney, C., Carney, R., Vancampfort, D., Stubbs, B., Kalucy, M., & Rosenbaum, S. (2019). Does exercise improve sleep quality in individuals with mental illness? A systematic review and meta-analysis. *Journal of Psychiatric Research*, *109*, 96–106. https://doi.org/10.1016/j.jpsychires.2018.11.004

Lev, S., & Ayalon, L. (2016). Moral distress among long-term care social workers: Questionnaire validation. *Research on Social Work Practice*, *28*(5), 628–637. https://doi.org/10.1177/1049731516672070

Litz, B. T., Stein, N., Delaney, E., Lebowitz, L., Nash, W. P., Silva, C., & Maguen, S. (2009). Moral injury and moral repair in war veterans: A preliminary model and intervention strategy. *Clinical Psychology Review*, *29*(8), 695–706. https://doi.org/10.1016/j.cpr.2009.07.003

Maguen, S., Griffin, B. J., Copeland, L. A., Perkins, D. F., Finley, E. P., & Vogt, D. (2020). Gender differences in prevalence and outcomes of exposure to potentially morally injurious events among post-9/11 veterans. *Journal of Psychiatric Research, 130,* 97–103. https://doi.org/10.1016/j.jpsychires.2020.06.020

Malik, S. A. (2015). Time pressure and challenge appraisal as predictors of job satisfaction: Empirical evidence from Pakistani universities. *SAGE Open*, *5*(2), Article 215824401558204. https://doi.org/10.1177/2158244015582044

Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job Burnout. *Annual Review of Psychology*, *52*, 397–422. https://doi.org/10.1146/annurev.psych.52.1.397

Mänttäri-van der Kuip, M. (2015). Moral distress among social workers: The role of insufficient resources. *International Journal of Social Welfare*, *25*(1), 86–97. https://doi.org/10.1111/ijsw.12163

Mänttäri-van der Kuip, M. (2020). Conceptualising work-related moral suffering—Exploring and refining the concept of moral distress in the context of social work. *The British Journal of*

Social Work, 50(3), 741–757. https://doi.org/10.1093/bjsw/bcz034

McFadden, P. (2015). *Measuring burnout among UK social workers: A Community Care study*. Queen's University Belfast. https://www.qub.ac.uk/sites/media/Media,514081,en.pdf

Miller, J. J., & Reddin Cassar, J. (2021). Self-care among healthcare social workers: The impact of COVID-19. *Social Work in Health Care*, *60*(1), 30–48. https://doi.org/10.1080/00981389.2021.1885560

Muller, A. E., Hafstad, E. V., Himmels, J. P. W., Smedslund, G., Flottorp, S., Stensland, S. Ø., Stroobants, S., Van de Velde, S., & Vist, G. E. (2020). The mental health impact of the covid-19 pandemic on healthcare workers, and interventions to help them: A rapid systematic review. *Psychiatry Research*, *293*, Article 113441. https://doi.org/10.1016/j.psychres.2020.113441

Nash, W. P., Marino Carper, T. L., Mills, M. A., Au, T., Goldsmith, A., & Litz, B. T. (2013). Psychometric evaluation of the Moral Injury Events Scale. *Military Medicine*, *178*(6), 646–652. https://doi.org/10.7205/milmed-d-13-00017

NHS. (2017, October 4). *Working in Social Care*. Health Careers. https://www.healthcareers.nhs.uk/working-health/working-social-care

NHS. (2024). *NHS data model and dicitonary. Social care worker*. https://www.datadictionary.nhs.uk/nhs_business_definitions/social_care_worker.html

NIA. (2020, February 15). *The IDVA Charter - NIA | Ending Violence Against Women and Girls*. https://niaendingviolence.org.uk/about-nia/the-idva-charter/#:~:text=All%20clients%20and%20staff%20of

Oates, J., Carpenter, D., Fisher, M., Goodson, S., Hannah, B., Kwiatkowski, R., Prutton, K., Reeves, D., & Wainwright, T. (2021). *BPS Code of Human Research Ethics*. The British Psychological Society. https://doi.org/10.53841/bpsrep.2021.inf180

O'Connell, C. B. (2014). Gender and the experience of moral distress in critical care nurses. *Nursing Ethics*, *22*(1), 32–42. https://doi.org/10.1177/0969733013513216

OHID–Office for Health Improvement & Disparities. (2022, March 29). *Vulnerabilities: applying All Our Health*. https://www.gov.uk/government/publications/vulnerabilities-applying-all-our-health/vulnerabilities-applying-all-our-health

Ondrejková, N., & Halamová, J. (2022). Prevalence of compassion fatigue among helping professions and relationship to compassion for others, self-compassion and self-criticism. *Health and Social Care in the Community, 30*(5), 1680–1694. https://doi.org/10.1111/hsc.13741

ONS–Office for National Statistics (2016). *Ethnic group, national identity and religion*. https://www.ons.gov.uk/methodology/classificationsandstandards/measuringequality/ethnicgroupnationalidentityandreligion

Pallant, J. (2010). *SPSS survival manual*. Mcgraw Hill Education.

Papazoglou, K., & Chopko, B. (2017). The role of moral suffering (moral distress and moral injury) in police compassion fatigue and PTSD: An unexplored topic. *Frontiers in Psychology*, *8,* Article 1999. https://doi.org/10.3389/fpsyg.2017.01999

Park, S., Johannes Thrul, Cooney, E. E., Atkins, K., Kalb, L. G., Closser, S., McDonald, K. M., Schneider-Firestone, S., Surkan, P. J., Rushton, C. H., Langhinrichsen-Rohling, J., & Veenema, T. G. (2023). Betrayal-based moral injury and mental health problems among healthcare and hospital workers serving COVID-19 patients. *Journal of Trauma & Dissociation*, *25*(2), 202–217. https://doi.org/10.1080/15299732.2023.2289195

Parry, B. (2021). *Burnout and related concepts: A systematic review exploring moral injury and burnout and an investigation into the role of individual psychological factors in the development of burnout in mental health nurses*. [Thesis]. The University of Edinburgh. https://doi.org/10.7488/era/1545

Parsonage, M., & Saini, G. (2017, September 5). *Mental health at work: The business costs ten years on.* Centre for Mental Health. https://www.centreformentalhealth.org.uk/publications/mental-health-work-business-costs-ten-years

Pehlivan, T., & Güner, P. (2018). Compassion fatigue: The known and unknown. *Journal of Psychiatric Nursing*, *9*(2), 129–134. https://doi.org/10.14744/phd.2017.25582

Pfefferbaum, B., & North, C. S. (2020). Mental health and the Covid-19 pandemic. *The New England Journal of Medicine*, *383*(6), 510–512. https://doi.org/10.1056/nejmp2008017

Posluns, K., & Gall, T. L. (2020). Dear mental health practitioners, take care of yourselves: A literature review on self-care. *International Journal for the Advancement of Counselling*, *42*, 1–20. https://doi.org/10.1007/s10447-019-09382-w

Prompahakul, C., Keim-Malpass, J., LeBaron, V., Yan, G., & Epstein, E. G. (2021). Moral distress among nurses: A mixed-methods study. *Nursing Ethics*, *28*(7–8), 1165–1182. https://doi.org/10.1177/0969733021996028

Ravalier, J., McFadden, P., Gillen, P., Mallett, J., Nicholl, P., Neill, R., Manthorpe, J., Moriarty, J., Schroder, H., & Curry, D. (2023). Working conditions and well-being in UK social care and social work during COVID-19. *Journal of Social Work*, *23*(2), 165–188. https://doi.org/10.1177/14680173221109483

Ritz, A., Brewer, G. A., & Neumann, O. (2016). Public service motivation: A systematic literature review and outlook. *Public Administration Review*, *76*(3), 414–426. https://doi.org/10.1111/puar.12505

Rodney, P. A. (2017). What we know about moral distress. *AJN, American Journal of Nursing*, *117*(2), S7–S10. https://doi.org/10.1097/01.naj.0000512204.85973.04

Romanou, E., & Belton, E. (2020). *Isolated and struggling: Social isolation and the risk of child maltreatment, in lockdown and beyond*. NSPCC Learning. https://learning.nspcc.org.uk/media/2246/isolated-and-struggling-social-isolation-risk-child-maltreatment-lockdown-and-beyond.pdf

Rushton, C. H. (2018). Mapping the path of moral adversity. In C. H. Rushton (Ed.), *Moral resilience: Transforming moral suffering in health care* (pp. 52–76). Oxford Academic. https://doi.org/10.1093/med/9780190619268.003.0004

Rushton, C. H. (2023). Transforming moral suffering by cultivating moral resilience and ethical practice. *American Journal of Critical Care*, *32*(4), 238–248. https://doi.org/10.4037/ajcc2023207

Rushton, C. H., Nelson, K. E., Antonsdottir, I., Hanson, G. C., & Boyce, D. (2022). Perceived organizational effectiveness, moral injury, and moral resilience among nurses during the COVID-19 pandemic. *Nursing Management*, *53*(7), 12–22. https://doi.org/10.1097/01.numa.0000834524.01865.cc

Rushton, C. H., Thomas, T. A., Antonsdottir, I. M., Nelson, K. E., Boyce, D., Vioral, A., Swavely, D., Ley, C. D., & Hanson, G. C. (2022). Moral injury and moral resilience in health care workers during COVID-19 pandemic. *Journal of Palliative Medicine*, *25*(5), 712–719. https://doi.org/10.1089/jpm.2021.0076

Semmer, N., Zapf, D., & Dunckel, H. (1998). Instrument zur streßbezogenen Tätigkeitsanalyse ISTA (Version 6.0.) [Instrument for stress- related job analysis (ISTA) (Version 6.0)]. In H. Dunckel (Ed.) *Handbuch psychologischer Arbeitsanalyseverfahren (Mensch, Technik, Organisation; Bd. 14*) (pp. 179–204). Hochschulverlag an der ETH, Zürich.

Shay, J. (1995). *Achilles in Vietnam: Combat trauma and the undoing of character.* Simon & Schuster.

Shay, J. (2014). Moral injury. *Psychoanalytic Psychology*, *31*(2), 182–191. https://doi.org/10.1037/a0036090

Silverman, H. J., Kheirbek, R. E., Moscou-Jackson, G., & Day, J. (2021). Moral distress in nurses caring for patients with Covid-19. *Nursing Ethics*, *28*(7-8), 1137–1164. https://doi.org/10.1177/09697330211003217

Skillsforcare. (2013). *Code of conduct for healthcare support workers and adult social care workers in england*. Skills for Care and Skills for Health. https://www.skillsforcare.org.uk/Documents/Standards-legislation/Code-of-Conduct/Code-of-Conduct.pdf

Skillsforcare. (2022). *What values do I need to work in social care?* https://www.skillsforcare.org.uk/Documents/Recruitment-and-retention/Careers-in-care/What-values-do-I-need-to-work-in-social-care.pdf

Skillsforcare. (2022/23). *The state of the adult social care sector and workforce in England*. https://www.skillsforcare.org.uk/adult-social-care-workforce-data/Workforce-intelligence/publications/national-information/The-state-of-the-adult-social-care-sector-and-workforce-in-England.aspx#:~:text=The%20staff%20turnover%20rate%20of

Skovholt, T. M. (2005). The cycle of caring: A model of expertise in the helping professions. *Journal of Mental Health Counseling*, *27*(1), 82–93. https://doi.org/10.17744/mehc.27.1.mj5rcvy6c713tafw

Social Work England. (2019, July). *Professional Standards*. https://www.socialworkengland.org.uk/standards/professional-standards/

Spilg, E. G., Rushton, C. H., Phillips, J. L., Kendzerska, T., Saad, M., Gifford, W., Gautam, M., Bhatla, R., Edwards, J. D., Quilty, L., Leveille, C., & Robillard, R. (2022). The new frontline: Exploring the links between moral distress, moral resilience and mental health in healthcare workers during the COVID-19 pandemic. *BMC Psychiatry*, *22*, Article 19. https://doi.org/10.1186/s12888-021-03637-w

Spence, M., Rose, D., & Tucker, J. A. (2014). Some wounds don't bleed: An examination of unresolved trauma in Vietnam veterans and its ethical implications through the lens of one man's story and beyond. *Ethical Human Psychology and Psychiatry*, *16*(3), 140–157. https://doi.org/10.1891/1559-4343.16.3.140

Sugrue, E. (2019). Understanding the effect of moral transgressions in the helping professions: In search of conceptual clarity. *Social Service Review*, *93*(1), 4–25. https://doi.org/10.1086/701838

Thibodeau, P. S., Nash, A., Greenfield, J. C., & Bellamy, J. L. (2023). The association of moral injury and healthcare clinicians' wellbeing: A systematic review. *International Journal of Environmental Research and Public Health, 20*(13), Article 6300. https://doi.org/10.3390/ijerph20136300

Thomas, T., Kumar, S., Davis, F. D., & Thammasitboon, S. (2022). 542: Key insights on pandemic moral distress: Role of misaligned ethical values in decision-making. *Critical Care Medicine*, *50*(1), 262–262. https://doi.org/10.1097/01.ccm.0000808492.62215.d4

UKHSA. (2023). *The Green Book* : *Chapter 14A* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1153300/Greenbook-chapter-14a-26April2023.pdf

Uyanık, G. K., & Güler, N. (2013). A study on multiple linear regression analysis. *Procedia - Social and Behavioral Sciences*, *106*, 234–240. https://doi.org/10.1016/j.sbspro.2013.12.027

Vincent, H., Jones, D. J., & Engebretson, J. (2020). Moral distress perspectives among interprofessional intensive care unit team members. *Nursing Ethics*, 27(6), 1450–1460. https://doi.org/10.1177/0969733020916747

Waitzman, E. (2022, December 9). *Staff shortages in the NHS and social care sectors.* UK Parliament, House of Lords Library. https://lordslibrary.parliament.uk/staff-shortages-in-the-nhs-and-social-care-sectors/#heading-4

Webber, J., Trothen, T. J., Finlayson, M., & Norman, K. E. (2021). Moral distress experienced by community service providers of home health and social care in Ontario, Canada. *Health & Social Care in the Community, 30*(5), 1662–1670. https://doi.org/10.1111/hsc.13592

Wiegand, D. L., & Funk, M. (2012). Consequences of clinical situations that cause critical care nurses to experience moral distress. *Nursing Ethics*, *19*(4), 479–487. https://doi.org/10.1177/0969733011429342

Williams, R. D., Brundage, J. A., & Williams, E. B. (2020). Moral injury in times of COVID-19. *Journal of Health Service Psychology*, *46*, 65–69. https://doi.org/10.1007/s42843-020-00011-4

Williamson, V., Murphy, D., & Greenberg, N. (2020). COVID-19 and experiences of moral injury in front-line key workers. *Occupational Medicine*, *70*(5), 317–319. https://doi.org/10.1093/occmed/kqaa052

Williamson, V., Murphy, D., Phelps, A., Forbes, D., & Greenberg, N. (2021). Moral injury: The effect on mental health and implications for treatment. *The Lancet Psychiatry, 8*(6), 453–455. https://doi.org/10.1016/s2215-0366(21)00113-9

Williamson, V., Stevelink, S. A. M., & Greenberg, N. (2018). Occupational moral injury and mental health: Systematic review and meta-analysis. *The British Journal of Psychiatry*, *212*(6), 339–346. https://doi.org/10.1192/bjp.2018.55

Wisco, B. E., Marx, B. P., May, C. L., Martini, B., Krystal, J. H., Southwick, S. M., & Pietrzak, R. H. (2017). Moral injury in U.S. combat veterans: Results from the national health and resilience in veterans study. *Depression and Anxiety*, *34*(4), 340–347. https://doi.org/10.1002/da.22614

Wong, A. M. F. (2020). Beyond burnout: Looking deeply into physician distress. *Canadian Journal of Ophthalmology, 55*(3), Supplement 1, 7–16. https://doi.org/10.1016/j.jcjo.2020.01.014

World Health Organization. (2019, May 28). *Burn-out an "occupational phenomenon": International classification of diseases*. https://www.who.int/news/item/28-05-2019-burn-out-an-occupational-phenomenon-international-classification-of-diseases#:~:text=%E2%80%9CBurn-out%20is%20a%20syndrome

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RESEARCH ARTICLE

Daily Variation in Sleep Duration, Affect, and Emotions in Croatian Youth: An Ambulatory Assessment

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Introduction: Sleep habits are related to mood stability and mental health, and adolescence may be an appropriate time to address disturbed sleep patterns because it is a critical period for the onset of psychological problems.
Aims: This study had two aims, namely: to explore associations between objectively measured sleep duration and positive and negative affect, as well as specific positive and negative emotions at the within-person and between-person levels in Croatian adolescents.
Methods: In the present eight-day study, 102 Croatian adolescents with an average age of 15 years reported how they felt once a day, while sleep duration was objectively measured by collecting data from an accelerometer on participants' smartphones.
Results: Multilevel analyses showed that adolescents express more positive affect (Est. = 0.10, $p < .050$) and feel less distracted (Est. = -0.12, $p < .050$) and happier (Est. = 0.11, $p < .050$) on days when they sleep longer, with a multiverse analysis suggesting that these results are moderately robust. In addition, they express higher levels of negative affect, stress and distraction on school days, and boys seem to experience more positive and fewer negative emotions.
Conclusions: A better understanding of daily variations in sleep duration, sleep quality, and affect would promote the development of individualized, particularly smartphone-based, sleep interventions. Such interventions could be a valuable tool for preventing mental health problems in adolescence.

Keywords: adolescence, mental health, sleep duration, ambulatory assessment, passive sensing data

Introduction

Scientists are exploring many ways to improve adolescent well-being (UNICEF, 2021; Solmi et al, 2020). One interesting pattern in adolescent development is related to their sleep and its quality (Gradisar et al., 2011). Adolescence may be a particularly appropriate time to address disturbed sleep patterns, as it is a critical period for the onset of psychological problems, but also an important period for the formation of healthy habits (Scott et al, 2021; Short et al, 2020). Numerous studies have clearly demonstrated that, on average, adolescents do not sleep optimally and that their sleep patterns do not ensure adequate levels of slow wave and rapid eye movement sleep (REM) (e.g., Gradisar et al., 2011; Talbot et al., 2010; Scott et al., 2021; Short et al., 2020). Studies refer to this phenomenon as the epidemic of sleep deprivation (Millman, 2005) or the great sleep recession (Keyes et al. 2015).

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Cross-sectional (Johansson et al., 2016), longitudinal (Keyes et al., 2015) and actigraphy studies all show that adolescents get less than seven hours of sleep on average (Bei et al., 2014) and Bartel et al. (2015) conclude that more than 20% of adolescents report sleep disturbances. Without any restriction, adolescents would sleep an average of nine hours, but Bartel et al.'s (2015) meta-analysis found that only 14% to 27% obtain that amount of sleep during school nights. Fuligni and Hardway (2006) have also used the diary method to examine daily variations in 14- and 15-year-old adolescents. Although the average sleep duration of their sample was eight hours, they found large fluctuations, not only between school nights and weekends, but also within school days. The reasons are primarily physiological: the circadian sleep-wake system in adolescence and the homeostatic system responsible for sleep pressure are delayed (Carskadon, 2010; Illingworth, 2020). Adolescents are characterized by an evening chronotype and given a choice, would prefer late sleep and late wake (Illingworth, 2020). Contextual variables play an additional role in, as Carskadon (2010) calls it, a "perfect storm": parental control decreases, many leisure and academic activities occur in the evening, school typically begins early in the morning, and social media, an important means of connecting with others, cause adolescents to additionally postpone bedtime.

The Role of Sleep in Stable Mood and Mental Health of Youth

Adolescence is a sensitive period of development: a recent meta-analysis of 192 epidemiological studies by Solmi et al. (2022) has shown that 60% to 73% of mental health problems occur by the age of 24, while 40% of these are mood disorders. According to recent reports, the prevalence of mental disorders in youth aged 10 to 19 years is about 16%, with anxiety and depression being the most common, accounting for more than 55% of all mental health disorders in this age group (UNICEF, 2021). Sleep habits and mental health are closely linked. Sarchiapone et al. (2014) concluded in their large cross-sectional study of nearly 12,000 participants from 11 European countries that sleep deprivation is associated with emotional and behavioral problems, problematic peer relationships, greater anxiety, and suicidal ideation. Talbot et al. (2010) reported that inconsistent sleep habits were even related to objective indicators such as increased amygdala reactivity and decreased prefrontal cortex activity.

Loss of REM sleep, found in youth who tend to sleep less, was also related to repeated negative thinking patterns, more catastrophizing, impulsivity, hostile interpretation of social encounters, and a less favorable interpretation of positive activities (Gujar et al., 2011; Scott et al., 2021; Simon et al., 2020). In addition, several meta-analyses have found significant evidence that sleep deprivation is related to depression (Lovato & Gradisar, 2014) and anxiety in adolescents (Short et al., 2020; Baglioni et al., 2016). Not only did individuals with a history of sleep problems exhibit an increased risk of developing mood or psychotic disorders, but adolescents with depressive symptoms were more likely to be awake in bed at night, wake up more frequently, and report subjectively poorer sleep quality (Lovato & Gradisar, 2014; Scott et al., 2021).

Possibilities for an Objective Measurement of Daily Variations in Adolescent Sleep Behavior

Because both mental health problems and sleep behaviors are characterized by individual daily variations and different meanings regarding these daily changes to each person, youth research is increasingly interested in the temporal dynamics and interplay, which can be assessed using daily reports, passive data collection, and experience sampling methods (Keijsers & van Roekel, 2018; Nelson & Allen, 2018). Dejonckheere et al. (2019) as well as Niemeijer et al. (2022) conclude that researchers in the field are interested not only in how a person feels or behaves on average, but also in how often people's emotions and behaviors vary and how stable they are.

On a daily level, authors typically operationalize mental health as positive and negative affect (Houben et al., 2015). A group of Belgian-Dutch authors has formed an *Experience Sampling Item Repository* (https://esmitemrepositoryinfo.com/) and have conducted dozens of studies where they measured positive and negative affect with various adjectives (Dietvorst et al., 2021; Kirtley et al., 2019, Myin-Germeys et al., 2018). Since emotions fluctuate as changes in our environment occur, Dejonckheere et al. (2019) argue that it is important to capture their dynamics to make conclusions about individual differences in mental health or psychopathology. Houben et al. (2015) have shown that lower well-being is related with more variable and unstable emotions, especially when examining negative affect.

Because sleep is a complex phenomenon, researchers have combined different assessment methods to gain a comprehensive understanding of it, progressing from cross-sectional and longitudinal studies that relied on questionnaires or sleep diaries (Repetti et al., 2015; Sadeh, 2015) to higher accuracy with more sensitive measurement methods such as electrophysiological sleep methods (e.g., EEG and EMG) and polysomnography, performed under

laboratory and clinical conditions (Baglioni et al., 2016). Practical and methodological challenges led to the uptake of actigraphy and passive sensing that captures telephone data (Aledavood et al., 2019). Because phones have embedded sensors, using mobile phones to collect data also provides non-invasive behavior tracking without interrupting daily habits. Objective measurements are particularly important because previous studies have shown that participants' objective data and subjective reports sometimes do not match. Objectively measured sleep duration and time in bed showed a high correlation with subjective impressions (i.e., participants had accurate perceptions), but sleep quality and restfulness differed (Difrancesco et al., 2021). Nelson and Allen (2018) describe that smartphone-collected sleep data combined with experience sampling questionnaires can address previously stated methodological issues by combining subjective impressions and objective information. Furthermore, a combination of momentary assessments could also enable a deeper understanding of not only group but also individual differences.

Studies using daily reports suggest that better sleep quality predicts a higher positive affect and lower negative affect, but when it comes to sleep duration, which has often been found problematic in adolescents, shorter sleep duration, when measured objectively, was shown to predict inattention, and is not related to positive or negative affect. Moreover, results suggest the bidirectionality of these relationships; however, these still remain inconsistent (Bouwmans et al., 2017; Difrancesco et al., 2021; Hennig et al., 2017; van Zundert et al., 2015). Niemeijer et al. (2022) conducted a multiverse study in which they tested whether various mobile sensors (accelerometer, charging, light, physical activity, screen activity, and Wi-Fi) could predict subjective sleep quality, daily negative affect, and person-level depression. They concluded that it is possible to explain differences in subjective sleep quality, but the study had some limitations. For example, the sample was relatively small (N = 50) and consisted mainly of university students. In addition, the accelerometer only collected x-axis data, not y- and z-axis data. While the x-axis and the y-axis are parallel to the screen of the device, the z-axis is perpendicular to it. The difference between the x-axis and the y-axis is that the first axis aligns with the top and bottom edges, while the second axis aligns with the left and right edges. The combination of all three axes allows for the acquisition of more sensitive data.

The Current Study

Adolescents were of interest in only two of the aforementioned studies, and the authors of this paper are not aware of any ambulatory studies examining associations between affect and objectively measured sleep duration in Croatia or in the wider region. Furthermore, all these studies examined positive and negative affects, but not specific emotions. In this study, we mainly focused on exploring associations of objectively measured sleep duration and both positive and negative affects at the within-person and the between-person level in Croatian youth. Based on cross-sectional and prospective longitudinal studies, we hypothesized lower sleep duration to predict lower positive affect and higher negative affect on both within-person and between-person levels. To gain new insights into adolescent everyday sleep and affect, especially for Croatian conditions, we will use objectively measured sleep duration as a predictor. Our second aim is exploratory; i.e., we hope to obtain that lower sleep duration predicts lower levels of specific positive emotions and higher levels of specific negative emotions.

Methods

Participants

We conducted this study within a larger research project *Testing the 5C framework of positive youth development: traditional and digital mobile assessment* (P.R.O.T.E.C.T.), funded by the Croatian Science Foundation. A total of 102 first-year Croatian high school students participated in this study, with a mean age of 15.13 years (SD = 0.42; age ranging from 14 to 17 years). 64% of the participants were female, 32% were male, and 4% of the youth preferred not to indicate their gender. While half of the participants attended grammar school (i.e., an educational program that prepares for college), the other half attended a three-, four-, or five-year vocational school. All participants lived in Croatia, evenly distributed in terms of their place of residence: 35% of them lived in a large city, 35% in a small town, and 31% in a village.

Procedure

Approval for this study was obtained from the Ministry of Science and Education, the National Agency for Education, and the institutional ethics committee. We also procured active parental consent. Participants in the larger

longitudinal panel study were asked if they would also like to participate in a mobile study that will last eight days. If they expressed their interest by answering yes and leaving their e-mail address, they received an initial e-mail with information about the study design, the mobile app used, data to be collected, detailed instructions on how to install the EARS mobile app, and the code required to enroll in the mobile study.

The study was conducted utilizing the *Effortless Assessment Research System* mobile app (EARS) for Android and iOS developed by Ksana Health (Lind et al., 2018). This app uses the participants' personal smartphone for ecological momentary assessment, but also for passive data collection. More specifically, the app EARS collects data generated by the common use of the phone, such as accelerometer, geolocation, or screen time (Lind et al., 2018).

Each participant has been assigned a unique ID for this study, and only the first author had the information on which ID is associated with which specific email address. E-mail addresses were kept in a secured file and deleted from the final database. After the study was completed, all participants received a gift voucher worth €13.

Sampling Scheme and Compliance

The sampling scheme included eight days with one measurement per day. Data collection took place during the school semester but has included both school days and weekends. Participants received a signal at 10 am and were asked to report how they felt at the moment; i.e., their morning mood was measured. We decided to send the signal at 10 o'clock because at this time all schools have a longer lunch break between classes so the students could use their phones and were able to answer the questions. The questionnaire contained eight questions and was available to participants for the next five hours. Once a day, the data collected by the mobile sensors were encrypted and uploaded to the secured cloud.

Although 496 students expressed interest in participating in this study, only 142 (29%) of them installed the app EARS on their smartphones. Thus, 1,136 questionnaires were planned; however, participants only completed 590 (52%) of them. Since an intensive longitudinal study should include at least five measurements, only the participants who completed at least five questionnaires were included in the final database. Finally, there were 102 participants; i.e., 78% of the 142 students who installed the app completed the study.

Measures

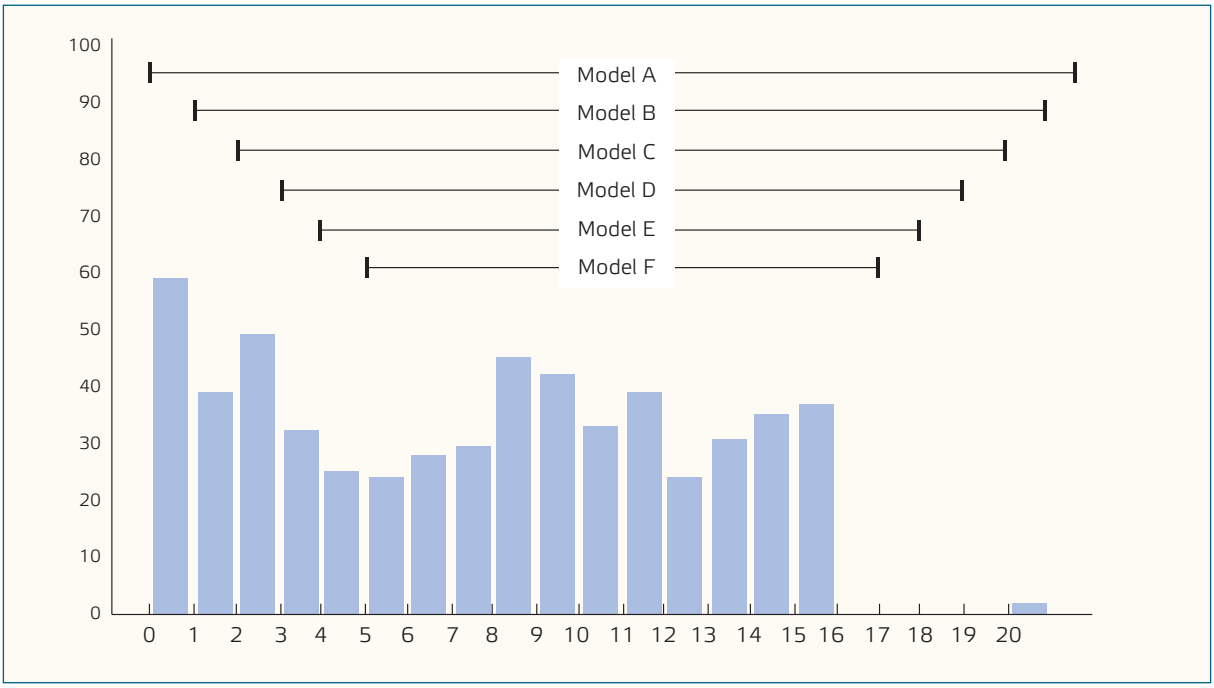
Affect

Participants' current affect was measured using an ad-hoc questionnaire including eight items that asked them how confident, tired, stressed, distracted, optimistic, worried, ashamed, and happy they felt at the moment. These items come from the Experience Sampling Item Repository; i.e. they have been used in previous studies by at least one of five different research groups in six different countries. Participants rated their emotions on a scale from 1 (not at all) to 5 (extremely). If the data are nested, it is recommended to analyze both within-subject and between-subject reliability, as estimates at one level do not reflect the true reliability of the scale unless the reliability is identical at both levels (Geldhof et al., 2014). The within-subject and between-subject reliability is estimated in a multilevel confirmatory factor analysis by using the TYPE = TWOLEVEL analysis in Mplus and adding model constraints (Geldhof et al., 2014). The positive affect was formed as a composite consisting of three items (confident, optimistic, and happy), showing a moderate reliability for the study sample at the within-person level (ω_{within} = .78) and a high reliability at the between-person level ($\omega_{between}$ = .88). The negative affect, on the other hand, was formed as a composite consisting of five items (tired, stressed, distracted, worried, and ashamed), but also showed a moderate reliability for the study sample at the within-person level (ω_{within} = .66) and a high reliability at the between-person level ($\omega_{between}$ = .93).

Sleep Duration

Sleep duration was measured objectively, using data collected by the accelerometer on participants' smartphones. Using a three-axis accelerometer, the app EARS provides data on bedtime, wake time, and sleep duration. This should provide more accurate information than a single-axis accelerometer used in previous studies; e.g., Niemeijer et al. (2022). Although subjective sleep duration was not estimated and it was not possible to verify the accuracy of the data collected, previous authors, such as Difrancesco et al. (2021) state that objectively measured sleep duration and time in bed showed a high correlation with subjective impressions. Sleep duration was reported in minutes.

Figure 1. Histogram of the sleep duration distribution from less than 1 hour to more than 20 hours



Notes: The horizontal axis represents sleep duration in hours; e.g. 0–1 hour, 1–2 hour, 2–3 hour, etc. The vertical axis represents the number of measurements in which certain hours of sleep occurred.

Statistical Methods

Although a three-axis accelerometer should provide accurate data on sleep duration, sleep duration in the present study ranged from 0 to 22 hours which has led us to question the most extreme result (see Figure 1). Therefore, the plausibility of the obtained results was tested statistically, rather than excluding some results as outliers without any criteria.

To check the robustness of the statistical results, we performed a multiverse analysis (Steegen et al., 2016), to examine models with different sleep duration. More specifically, five additional datasets were prepared in such a way that the minimum sleep duration was increased, and the maximum sleep duration was decreased by one hour in each subsequent model (see Figure 1). Altogether, six models were tested:

- Model A - sleep duration ranging from 0 to 22 hours (data from 451 measurement points),
- Model B - sleep duration ranging from 1 to 21 hours (data from 416 measurement points),
- Model C - sleep duration ranging from 2 to 20 hours (data from 397 measurement points),
- Model D - sleep duration in the range from 3 to 19 hours (data from 373 measurement points),
- Model E - sleep duration in the range of 4 to 18 hours (data from 349 measurement points),
- Model F - sleep duration in the range of 5 to 17 hours (data from 328 measurement points).

Intraclass correlations (ICCs) greater than .05 (González-Romá & Hernández, 2017) suggest that the relationship between sleep duration and emotions should be modelled at two levels; i.e., within-person and between-person. Therefore, multilevel regression models with sleep duration as predictor and positive affect, negative affect, and each of the eight emotions as criterion were estimated with TYPE=TWOLEVEL and ESTIMATOR=MLR in Mplus (version 8.8, Muthén & Muthén, 2017). Since Rhemtulla et al. (2012) suggested using the maximum likelihood method with five or more categories, and both the DWLS and MLR estimators seem to generate structural paths equally well (Li, 2021), we decided to treat emotions as a continuous scale and use the MLR estimator. In addition, multilevel regression models were estimated with the day of the week (school day vs. weekend) as a within-person predictor and gender, age, school type and place of residence as between-person predictors.

Results

Descriptive Statistics

As shown in Table 1, students slept an average of seven and half hours per day, with sleep durations ranging from less than an hour to as many as 22.5 hours. On average, adolescents reported the highest levels of happiness and the lowest levels of shame, with fatigue showing the greatest variability across days and participants. We tested whether the averages of personal mean scores regarding all variables differed on weekdays and weekends by performing t-tests for independent samples. In the participants' responses, no statistically significant differences manifested between school days and weekends for sleep duration (t = - 0.92, df = 244, p = .361) and for positive affect (t = - 0.96, df = 588, p = .337); however, negative affect was higher on school days (t = 3.02, df = 588, p = .003, d = .28; $M_{weekdays}$ = 2.38, $SD_{weekdays}$ = 0.93; $M_{weekends}$ = 2.13, $SD_{weekends}$ = 0.89).

Table 1. Descriptive Statistics for Sleep Duration, Positive and Negative Affect, and Specific Emotions

Variable	No. of occasions	Min	Max	M[1]	Mdn[2]	25th percentile	50th percentile	75th percentile	SD	ICC[3]
Sleep duration (in minutes)	580	0	1350	458.84	-	-	-	-	296.66	-
Positive affect	590	1	5	3.46	-	-	-	-	0.98	.54
Negative affect	590	1	5	2.31	-	-	-	-	0.92	.63
Confidence	587	1	5	3.44	3.00	3.00	3.00	4.00	1.16	.57
Optimism	589	1	5	3.34	3.00	3.00	3.00	4.00	1.16	.50
Happiness	589	1	5	3.59	4.00	3.00	4.00	4.00	1.13	.47
Fatigue	589	1	5	2.92	3.00	2.00	3.00	4.00	1.39	.57
Stress	590	1	5	2.41	2.00	1.00	2.00	3.00	1.33	.47
Distraction	588	1	5	2.4	2.00	1.00	2.00	3.00	1.26	.45
Worry	587	1	5	2.34	2.00	1.00	2.00	3.00	1.26	.42
Shame	586	1	5	1.5	1.00	1.00	1.00	2.00	0.86	.39

[1] Average of personal mean scores.
[2] Median of personal mean scores.
[3] Intraclass correlation.

Associations of Affect, Emotions, and Sleep Duration

The results of the multilevel regression (Table 2) show that objectively measured sleep duration did not correlate significantly with negative affect, fatigue, stress, worry, shame, or optimism, either at the within-person or between-person level. However, it was indicated that sleep duration serves as a significant positive predictor of positive affect, confidence, and happiness and a significant negative predictor of distraction at the within-person level. Thus, on days when the adolescents slept longer, they experienced a higher level of confidence, happiness, and positive affect as well as a lower level of distraction. In addition, longer sleep duration predicted less fatigue at the within-person level in the model in which sleep duration ranged from five to 17 hours.

Appendix A presents a summary listing the main outcomes of the multiverse analysis, while Appendix B illustrates how the p value varied from model A to model F, or in other words, how robust these results were. The robustness of the results was demonstrated in three of six models with different ranges of sleep duration for positive affect, happiness, and distraction. A significant effect for confidence was shown only in the base model, from which none of the outliers were removed.

To explain our results and see whether any demographic variables contribute to explaining the variance in affect and specific emotions, we decided to include a within-person variable; i.e., day of the week (school day vs. weekend), and between-person variables – gender, age, school type and place of residence – in our model (Table

3). Sleep duration remained a significant positive predictor of positive affect and happiness even after adding the new control variables, which indicates the robustness of these associations. Specific days of the week proved to be significant negative predictors of negative affect, stress, and distraction. In other words, adolescents experienced more stress, distraction, and negative affect than they do on typical school days.

At the between-person level, gender proved to be a predictor of confidence, stress, distraction, and shame. The results suggest that, on average, boys experience higher levels of confidence, and lower levels of stress, distraction, and shame. In addition, students from vocational schools reported higher levels of confidence, while adolescents from large cities reported higher levels of happiness and lower levels of fatigue and distraction.

Table 2. Results of the Multilevel Regression Analysis for Affect, Emotions, and Sleep Duration

	Within-person		Between-person	
	Est.	S.E.	Est.	S.E.
Positive affect	.12*	.05	-.09	.21
Negative affect	-.08	.05	.08	.24
Confidence	.10*	.05	-.10	.19
Optimism	.08	.04	-.01	.22
Happiness	.12*	.05	-.11	.24
Fatigue	-.09	.05	.31	.22
Stress	-.03	.05	.02	.24
Distraction	-.14**	.05	.27	.24
Worry	-.04	.05	-.06	.28
Shame	.08	.05	-.44	.27

Est. = standardized effects using STDYX standardization in Mplus; S.E. = standard errors of the parameter estimates using STDYX standardization in Mplus; significance based on two-sided p values of the unstandardized effects: * = $p < .050$, ** = $p < .010$

Table 3. Summary of the Main Outcomes for the Multiverse Analysis of the Within-Person and Between-Person Correlations of Affect and Emotions with Day of the Week, Sleep Duration, Gender, Age, School Type, and Place of Residence

	Weekday	Sleep duration		Gender	Age	School type	Place of residence
	Within-person	Within-person	Between-person	Between-person	Between-person	Between-person	Between-person
	Est. (S.E.)	Est. (S.E.)	Est. (S.E.)	Est. (S.E.)	Est. (S.E.)	Est. (S.E.)	Est. (S.E.)
Positive affect	.09 (.05)	.11 (.05)*	-.47 (.40)	-.25 (.21)	-.22 (.16)	.37 (.23)	.24 (.16)
Negative affect	-.19 (.05)**	-.08 (.06)	.39 (.46)	.32 (.22)	.16 (.20)	-.17 (.26)	-.29 (.18)
Confidence	.05 (.06)	.08 (.07)	-.25 (.27)	.37 (.13)**	-.23 (.11)*	.33 (.16)*	.12 (.12)
Optimism	.07 (.05)	.06 (.06)	-.10 (.33)	-.33 (.18)	-.18 (.15)	.12 (.19)	.05 (.14)
Happiness	.07 (.05)	.13 (.06)*	-.32 (.29)	-.25 (.15)	.02 (.11)	.22 (.18)	.25 (.12)*
Fatigue	-.02 (.06)	-.07 (.04)	.24 (.32)	.29 (.17)	.09 (.15)	.12 (.19)	-.26 (.13)*
Stress	-.19 (.06)**	-.04 (.05)	.18 (.32)	.36 (.17)*	.03 (.13)	-.13 (.20)	-.23 (.15)
Distraction	-.19 (.05)*	-.12 (.05)	.39 (.32)	.39 (.15)**	.15 (.22)	-.01 (.18)	-.34 (.14)*
Worry	-.11 (.05)	-.05 (.06)	.19 (.36)	.35 (.17)	.16 (.18)	-.33 (.18)	-.07 (.17)
Shame	-.04 (.06)	.06 (.06)	-.23 (.32)	.49 (.18)**	-.07 (.13)	.07 (.21)	.08 (.15)

Est. = standardized effects using STDYX standardization in Mplus; S.E. = standard errors of the parameter estimates using STDYX standardization in Mplus; significance based on two-sided p values of the unstandardized effects: * = $p < .050$, ** = $p < .010$

Discussion

Participants in the present study slept an average of seven and a half hours per day and showed wide variability in sleep duration, ranging from less than one hour to 22.5 hours, which is comparable with findings from Fuligni and Hardway (2006). Although the adolescents in the present study received optimal hours of sleep per night, as suggested by Paruthi et al. (2016), the variability in sleep duration suggests that sleep disturbances or at least inconsistent sleep patterns may be present.

We felt that distinguishing affect from specific emotions would provide a deeper understanding of the importance of sleep for mental health in adolescence, but we were not aware of any other studies that examined specific emotions. In the present study, sleep duration did not predict students' negative affect, but was a significant predictor of positive affect at the individual level. Studies subjectively measuring adolescents' sleep duration showed that shorter sleep duration predicted poorer mood in the morning and more anxiety symptoms the next day (Cousins et al., 2011; Fuligni & Hardway, 2006; Wrzus et al., 2014). Some authors (e.g., Cousins et al., 2011; Fuligni & Hardway, 2006) even found that the relationship between sleep duration and mood was bidirectional. On the other hand, Niemeijer et al. (2022) found that mobile sensor sensing data on sleep quality predicted subjective sleep quality far better than negative affect. It is possible that subjective sleep quality, and not the sleep duration, determines negative affect. Poor sleep and fatigue can reduce the cognitive abilities of adolescents and lead to a downward spiral in which poor sleep predicts negative affect and negative affect predicts the quality of sleep the next night (van Zundert et al., 2015). In addition, differences between our study and the previous studies may exist because previous studies examined early- and middle-aged adolescents, whereas the present study examined late-aged adolescents. While changes in academic, social, and biological systems lead to changes in sleep-wake rhythms in early adolescence (Carskadon & Acebo, 2002), late adolescents may develop socioemotional skills that could help them better withstand these changes. In other words, their coping skills may be less affected by poor sleep quality.

When it comes to emotions such as fatigue, stress, worry, shame, and optimism, it has to be noted that other daily studies mostly examined positive and negative affect, and not specific emotions. In the present study, participants have expressed more positive emotions, especially happiness, and fewer negative emotions, with fatigue being the most common. Since these are a person's average affect levels, this could indicate a healthy emotional functioning; i.e., we have included a general, healthy sample, experiencing more positive and fewer negative emotions. Authors of previous studies usually aggregated self-reported estimations of specific positive and negative emotions and it seems possible that statistically significant correlations occurred because of only some of the emotions combined in a measure of affect. The present results also support this: daily sleep duration seems to be related to daily happiness and distraction. A study from Henning et al. (2017) measuring adolescents' sleep duration subjectively showed that shorter sleep duration predicted more self-reported inattention. When compared to our study, we have found a similar pattern for distraction (which could relate to inattention) on a within-person level, meaning that when a person sleeps less than their own average, they feel more distracted.

In addition, in the present study, sleep duration only predicted positive affect, distraction, and happiness at the individual level. Although estimates on group level were high, no significant differences were found since standard errors that inform us on variability were high. This is not consistent with the work by Short et al. (2020), who conducted a meta-analysis including 73 studies and attempted to find causal contributions to positive and negative mood and emotion regulation. Their results, which included otherwise healthy youth, showed that less sleep was associated with a 55% higher likelihood of mood deficits: elevated anger, anxiety, and depressed mood, as well as fewer positive emotions. Our results underline the need for including individual approaches, especially when planning interventions. If individuals are educated to nurture their sleep regime, that could lead to more positive emotions on a daily level. The ability to nurture positive experiences even after shorter sleep nights might be crucial and our results could align with that (Gujar et al., 2011; Simon et al., 2020).

The effects of sleep duration on positive affect were found to be robust in three of the six models tested; i.e., they were not significant when the range of sleep duration was reduced to a minimum of three and a maximum of 19 hours of sleep. The same results were obtained for happiness and distraction. On the one hand, models with a narrower span of sleep duration may contain less measurement error, and robust effects should occur even in smaller samples. On the other hand, daily affect exhibits large variability, and the sample size, both of participants and of measurement points, may be important for error reduction. While Model A, in which sleep duration ranged from 0 to 22 hours, had 451 measurement points, Model D, in which sleep duration ranged from 3 to 19 hours and effects became insignificant, had 373 measurement points. These results suggest, therefore, some

interesting trends regarding the relationship between objective sleep duration and positive affect, happiness, and distraction, but should be replicated in a study encompassing more participants, more measurement points (both days and beeps on one day), and a combination of objective and subjective sleep duration information to verify the accuracy of the passive sensing data.

Additionally, in the present study, we tested whether within-person variables such as day of the week (school day vs. weekend), and between-person variables such as gender, age, school type, and place of residence, altered the percentage of variance in affect and specific emotions explained by sleep duration. Sleep duration remained a significant positive predictor of positive affect and happiness even after adding the control variables. In addition to sleep duration, the day of the week, gender, type of school and place of residence also play an important role in the adolescents' affect. The results suggest that school stress, for example school commitments, is associated with higher levels of negative affect, which is consistent with previous studies (see Scrimin et al., 2014). Additionally, Tsai (2019) reports cross-national evidence from 46 studies that workdays elicit more negative mood reports. Our study has shown that on average, boys experience higher levels of confidence and lower levels of stress, distraction, and shame. These findings are also consistent with gender differences in subjective well-being and mental health (Yoon et al., 2023). Students from vocational schools reported higher levels of confidence, which can be explained by less demanding schoolwork and more practical experience.

Strengths and Limitations

The greatest strength of the present study is the use of passive sensing data from participants' smartphones to measure their sleep duration. Most studies examining the relationship between sleep and mood, or mental health, have collected subjective reports of sleep duration. When participants are interviewed in daily diaries, they may provide accurate information, but passive data are likely to be more accurate. It should be noted, however, that these data are collected by sensors on the smartphone and are dependent on phone usage. That is, for example, if a person does not use the smartphone before going to bed, it is possible that this passive data is not entirely accurate. Additionally, due to technical problems in the collection of data from smartphone accelerometer, more measurement points were recorded for affect than for sleep duration. Therefore, the degrees of freedom for sleep duration differ from the degrees of freedom for positive and negative affect. Finally, we must question the long hours of detected sleep which is a very probable inaccuracy. The main limitation of this study lies in the fact that it did not combine objective and subjective measures of sleep, especially questions about the subjective perception of sleep duration, sleep disturbance and sleep quality that could shed more light onto an individual's perception of their sleep and how this relates to emotions. This would allow us to compare the effect of objective and subjective measures and their effects on affect, as well as to verify the accuracy of the data collected. This study did not account for circadian preferences and specific differences among adolescents, and that could also play a role in mood dynamics since it was measured in the first part of the day. An important flaw of this study consists in the fact that affect was measured once per day, in a manner of a diary study, and it would have been far more accurate had we used a design with multiple measurements per day. Nevertheless, diary study itself provides us a more accurate insight than one time survey measurement. Additionally, this study did not employ important items for negative affect that could also be valuable, such as sadness or loneliness.

Conclusions, Implications and Future Directions

Adolescents seem to express more positive affect and happiness as well as less distraction on days when they sleep longer. They also express higher levels of negative affect, stress, and distraction on school days. In addition, boys report more positive and fewer negative emotions on average. Although the results of the present study demonstrated moderate robustness in terms of the accuracy regarding measuring sleep duration with the accelerometer, they underscore the importance for studying the relationships between sleep quality and positive affect in adolescents' daily life. Future studies should combine objective and subjective measures of sleep, ideally with several measurements per day. In addition, focusing on specific emotions and including some emotions that were not considered in the present study, such as sadness or loneliness, would lead to a better understanding of the role that sleep plays in adolescents' mood. Finally, the inclusion of not only demographic variables but also personality variables – such as circadian preferences – would help to explain interindividual differences in the associations between sleep and affect. As it is well known, and as the current study again demonstrated, regular and adequate

sleep is important for adolescent well-being. Therefore, public health efforts to improve sleep health literacy in youth are an important avenue for investments.

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Author contribution
Lucija ŠUTIĆ: conceptualization, investigation, data management, formal analysis, interpretation, writing original draft.
Miranda NOVAK: conceptualization, methodology, funding acquisition, project administration, supervision, formal analysis, interpretation, supervision, writing original draft.

Declaration of interest statement
The authors declare that they have no conflict of interest.

Ethical statement
This manuscript is the authors' original work.
All participants engaged in the research voluntarily and anonymously.
Their data are stored in coded materials and databases without personal data.
The studies involving human participants were reviewed and approved by the Ethics Committee of the Faculty of Education and Rehabilitation Sciences of the University of Zagreb under 251-74/20-01/2.

Data Availability Statement
Datasets presented in this article are available from the corresponding author upon reasonable request.

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References

Aledavood, T., Torous, J., Triana Hoyos, A. M., Naslund, J. A., Onnela, J. P., & Keshavan, M. (2019). Smartphone-based tracking of sleep in depression, anxiety, and psychotic disorders. *Current Psychiatry Reports*, *21*, Article 49. https://doi.org/10.1007/s11920-019-1043-y

Baglioni, C., Nanovska, S., Regen, W., Spiegelhalder, K., Feige, B., Nissen, C., Reynolds, C. F. III, & Riemann, D. (2016). Sleep and mental disorders: A meta-analysis of polysomnographic research. *Psychological Bulletin, 142*(9), 969–990. https://doi.org/10.1037/bul0000053

Bartel, K. A., Gradisar, M., & Williamson, P. (2015). Protective and risk factors for adolescent sleep: A meta-analytic review. *Sleep Medicine Reviews, 21,* 72–85. https://doi.org/10.1016/j.smrv.2014.08.002

Bei, B., Allen, N. B., Nicholas, C. L., Dudgeon, P., Murray, G., & Trinder, J. (2014). Actigraphy-assessed sleep during school and vacation periods: A naturalistic study of restricted and extended sleep opportunities in adolescents. *Journal of Sleep Research*, *23*(1), 107–117. https://doi.org/10.1111/jsr.12080

Bouwmans, M. E. J., Bos, E. H., Hoenders, H. J. R., Oldehinkel, A. J., & de Jonge, P. (2017). Sleep quality predicts positive and negative affect but not vice versa. An electronic diary study in depressed and healthy individuals. *Journal of Affective Disorders, 207*, 260–267. https://doi.org/10.1016/j.jad.2016.09.046

Carskadon, M. A., & Acebo, C. (2002). Regulation of sleepiness in adolescents: Update, insights, and speculation. *Sleep, 25*(6), 606–614. https://doi.org/10.1093/sleep/25.6.606

Cousins, J. C., Whalen, D. J., Dahl, R. E., Forbes, E. E., Olino, T. M., Ryan, N. D., & Silk, J. S. (2011). The bidirectional association between daytime affect and nighttime sleep in youth with anxiety and depression. *Journal of Pediatric Psychology, 36*(9), 969–979. https://doi.org/10.1093/jpepsy/jsr036

Dejonckheere, E., Mestdagh, M., Houben, M., Rutten, I., Sels, L., Kuppens, P., & Tuerlinckx, F. (2019). Complex affect dynamics add limited information to the prediction of psychological well-being. *Nature Human Behaviour*, *3*, 478–491. https://doi.org/10.1038/s41562-019-0555-0

Dietvorst, E., Hiemstra, M., Maciejewski, D., van Roekel, E., ter Bogt, T., Hillegers, M., & Keijsers, L. (2021). Grumpy or depressed? Disentangling typically developing adolescent mood from prodromal depression using experience sampling methods. *Journal of Adolescence*, *88*(1), 25–35. https://doi.org/10.1016/j.adolescence.2021.01.009

Difrancesco, S., Penninx, B. W. J. H., Antypa, N., van Hemert, A. M., Riese, H., & Lamers, F. (2021). The day-to-day bidirectional longitudinal association between objective and self-reported sleep and affect: An ambulatory assessment study. *Journal of Affective Disorders, 283*, 165–171. https://doi.org/10.1016/j.jad.2021.01.052

Fuligni, A. J., & Hardway, C. (2006). Daily variation in adolescents' sleep, activities, and psychological well-being. *Journal of Research on Adolescence, 16*(3), 353–378. https://doi.org/10.1111/j.1532-7795.2006.00498.x

Geldhof, G. J., Preacher, K. J., & Zyphur, M. J. (2014). Reliability estimation in a multilevel confirmatory factor analysis framework. *Psychological Methods, 19*(1), 72–91. https://doi.org/10.1037/a0032138

González-Romá, V., & Hernández, A. (2017). Multilevel modeling: Research-based lessons for substantive researchers. *Annual Review of Organizational Psychology and Organizational Behavior, 4*, 183–210. https://doi.org/10.1146/annurev-orgpsych-041015-062407

Gradisar, M., Gardner, G., & Dohnt, H. (2011). Recent worldwide sleep patterns and problems during adolescence: A review and meta-analysis of age, region, and sleep. *Sleep Medicine*, *12*(2), 110–118. https://doi.org/10.1016/j.sleep.2010.11.008

Gujar, N., Yoo, S.-S., Hu, P., & Walker, M. P. (2011). Sleep deprivation amplifies reactivity of brain reward networks, biasing the appraisal of positive emotional experiences. *Journal of Neuroscience*, *31*(12), 4466–4474. https://doi.org/10.1523/JNEUROSCI.3220-10.2011

Hennig, T., Krkovic. K., & Lincoln T. M. (2017). What predicts inattention in adolescents? An experience-sampling study comparing chronotype, subjective and objective sleep parameters. *Sleep Medicine, 38*, 58–63. https://doi.org/10.1016/j.sleep.2017.07.009

Houben, M., Van Den Noortgate, W., & Kuppens, P. (2015). The relation between short-term emotion dynamics and psychological well-being: A meta-analysis. *Psychological Bulletin*, *141*(4), 901–930. https://doi.org/10.1037/a0038822

Illingworth, G. (2020). The challenges of adolescent sleep. *Interface Focus*, *10*(3), Article 20190080. https://doi.org/10.1098/rsfs.2019.0080

Johansson, A. E. E., Petrisko, M. A., & Chasens, E. R. (2016). Adolescent sleep and the impact of technology use before sleep on daytime function. *Journal of Pediatric Nursing*, *31*(5), 498–504. https://doi.org/10.1016/j.pedn.2016.04.004

Keijsers, L., & van Roekel, E. (2018). Longitudinal methods in adolescent psychology: Where could we go from here? And should we? In L. B. Hendry & M. Kloep (Eds.), *Reframing adolescent research* (pp. 56–77). Routledge. https://doi.org/10.4324/9781315150611-4

Keyes, K. M., Maslowsky, J., Hamilton, A., & Schulenberg, J. (2015). The great sleep recession: Changes in sleep duration among US adolescents, 1991–2012. *Pediatrics, 135*(3), 460–468. https://doi.org/10.1542/peds.2014-2707

Kirtley, O. J., Eisele, G., Kunkels, Y. K., Hiekkaranta, A. P., Van Heck, L., Pihlajamäki, M., Kunc, B., Schoefs, S., Kemme, N., Biesemans, T., & Myin-Germeys, I. (2019, April 2). *The Experience Sampling Method (ESM) Item Repository*. https://doi.org/10.17605/OSF.IO/KG376

Li, C.-H. (2021) Statistical estimation of structural equation models with a mixture of continuous and categorical observed variables. *Behavior Research Methods, 53*, 2191–2213. https://doi.org/10.3758/s13428-021-01547-z

Lind, M. N., Byrne, M. L., Wicks, G., Smidt, A. M., Allen, N.B. (2018). The Effortless Assessment of Risk States (EARS) Tool: An interpersonal approach to mobile sensing. *JMIR Mental Health*, *5*(3), Article 10334. https://doi.org/10.2196/10334

Lovato, N., & Gradisar, M. (2014). A meta-analysis and model of the relationship between sleep and depression in adolescents: Recommendations for future research and clinical practice. *Sleep Medicine Reviews*, *18*(6), 521–529. https://doi.org/10.1016/j.smrv.2014.03.006

Millman, R. P., & Working Group on Sleepiness in Adolescents/Young Adults, & AAP Committee on Adolescence. (2005). Excessive sleepiness in adolescents and young adults: Causes, consequences, and treatment strategies. *Pediatrics*, *115*(6), 1774–1786. https://doi.org/10.1542/peds.2005-0772

Muthén, L., & Muthén, B. O. (2017). *Mplus: Statistical analysis with latent variables: User's guide* (8th ed.). Muthén & Muthén.

Nelson, B. W., & Allen, N. B. (2018). Extending the passive-sensing toolbox: Using smart-home technology in psychological science. *Perspectives on Psychological Science*, *13*(6), 718–733. https://doi.org/10.1177/1745691618776008

Niemeijer, K., Mestdagh, M., & Kuppens, P. (2022). Tracking subjective sleep quality and mood with mobile sensing: Multiverse study. *Journal of Medical Internet Research, 24*(3), Article 25643. https://doi.org/10.2196/25643

Paruthi, S., Brooks, L. J., D'Ambrosio, C., Hall, W. A., Kotagal, S., Lloyd, R. M., Malow, B. A., Maski, K., Nichols, C., Quan, S. F., Rosen, C. L., Troester, M. M., & Wise, M. S. (2016). Consensus statement of the American Academy of Sleep Medicine on the recommended amount of sleep for healthy children: Methodology and discussion. *Journal of Clinical Sleep Medicine*, *12*(11), 1549–1561. https://doi.org/10.5664/jcsm.6288

Repetti, R. L., Reynolds, B. M., & Sears, M. S. (2015). Families under the microscope: Repeated sampling of perceptions, experiences, biology, and behavior. *Journal of Marriage and Family, 77*(1), 126–146. https://doi.org/10.1111/jomf.12143

Rhemtulla, M., Brosseau-Liard, P. É., & Savalei, V. (2012). When can categorical variables be treated as continuous? A comparison of robust continuous and categorical SEM estimation methods under suboptimal conditions. *Psychological Methods, 17*(3), 354–373. https://doi.org/10.1037/a0029315

Sadeh, A. (2015). Sleep assessment methods. *Monographs of the Society for Research in Child Development*, *80*(1), 33–48. https://doi.org/10.1111/mono.12143

Sarchiapone, M., Mandelli, L., Carli, V., Iosue, M., Wasserman, C., Hadlaczky, G., Hoven, C. W., Apter, A., Balazs, J., Bobes, J., Brunner, R., Corcoran, P., Cosman, D., Haring, C., Kaess, M., Keeley, H., Keresztény, A., Kahn, J.-P., Postuvan V., … Wasserman, D. (2014). Hours of sleep in adolescents and its association with anxiety, emotional concerns, and suicidal ideation. *Sleep Medicine*, *15*(2), 248–254. https://doi.org/10.1016/j.sleep.2013.11.780

Simon, E. B., Vallat, R., Barnes, C. M., & Walker, M. P. (2020). Sleep loss and the socio-emotional brain. *Trends in Cognitive Sciences*, *24*(6), 435–450. https://doi.org/10.1016/j.tics.2020.02.003

Scott, J., Kallestad, H., Vedaa, O., Sivertsen, B., & Etain, B. (2021). Sleep disturbances and first onset of major mental disorders in adolescence and early adulthood: A systematic review and meta-analysis. *Sleep Medicine Reviews*, *57*, Article 101429. https://doi.org/10.1016/j.smrv.2021.101429

Scrimin, S., Mason, L., & Moscardino, U. (2014). School-related stress and cognitive performance: A mood-induction study. *Contemporary Educational Psychology*, *39*(4), 359–368. https://doi.org/10.1016/j.cedpsych.2014.09.002

Short, M. A., Booth, S. A., Omar, O., Ostlundh, L., & Arora, T. (2020). The relationship between sleep duration and mood in adolescents: A systematic review and meta-analysis. *Sleep Medicine Reviews*, *52*, Article 101311. https://doi.org/10.1016/j.smrv.2020.101311

Solmi, M., Radua, J., Olivola, M., Croce, E., Soardo, L., Salazar de Pablo, G., Shin, J. I., Kirkbride, J. B., Jones, P., Kim, J. H., Kim, J. Y., Carvalho, A. F., Seeman, M. V., Correll, C. U., & Fusar-Poli, P. (2022). Age at onset of mental disorders worldwide: Large-scale meta-analysis of 192 epidemiological studies. *Molecular Psychiatry*, *27*, 281–295. https://doi.org/10.1038/s41380-021-01161-7

Steegen, S., Tuerlinckx, F., Gelman, A., & Vanpaemel, W. (2016). Increasing transparency through a multiverse analysis. *Perspectives on Psychological Science, 11*(5), 702–712. https://doi.org/10.1177/1745691616658637

Talbot, L. S., McGlinchey, E. L., Kaplan, K. A., Dahl, R. E., & Harvey, A. G. (2010). Sleep deprivation in adolescents and adults: Changes in affect. *Emotion*, *10*(6), 831–841. https://doi.org/10.1037/a0020138

Tsai, M.-C. (2019). The good, the bad, and the ordinary: The day-of-the-week effect on mood across the globe. *Journal of Happiness Studies*, *20*(7), 2101–2124. https://doi.org/10.1007/s10902-018-0035-7

United Nations Children's Fund: *The State of the World's Children 2021: On My Mind – Promoting, protecting and caring for children's mental health*. UNICEF. https://www.unicef.org/media/114636/file/SOWC-2021-full-report-English.pdf

van Zundert, R. M. P., van Roekel, E., Engels, R. C. M. E., & Scholte, R. H. J. (2015). Reciprocal associations between adolescents' night-time sleep and daytime affect and the role of gender and depressive symptoms. *Journal of Youth and Adolescence*, *44*, 556–569. https://doi.org/10.1007/s10964-013-0009-3

Wrzus, C., Wagner, G. G., & Riediger, M. (2014). Feeling good when sleeping in? Day-to-day associations between sleep duration and affective well-being differ from youth to old age. *Emotion, 14*(3), 624–628. https://doi.org/10.1037/a0035349

Yoon, Y., Eisenstadt, M., Lereya, S. T., & Deighton, J. (2023). Gender difference in the change of adolescents' mental health and subjective wellbeing trajectories. *European Child & Adolescent Psychiatry*, *32*(9), 1569–1578.

Appendix A

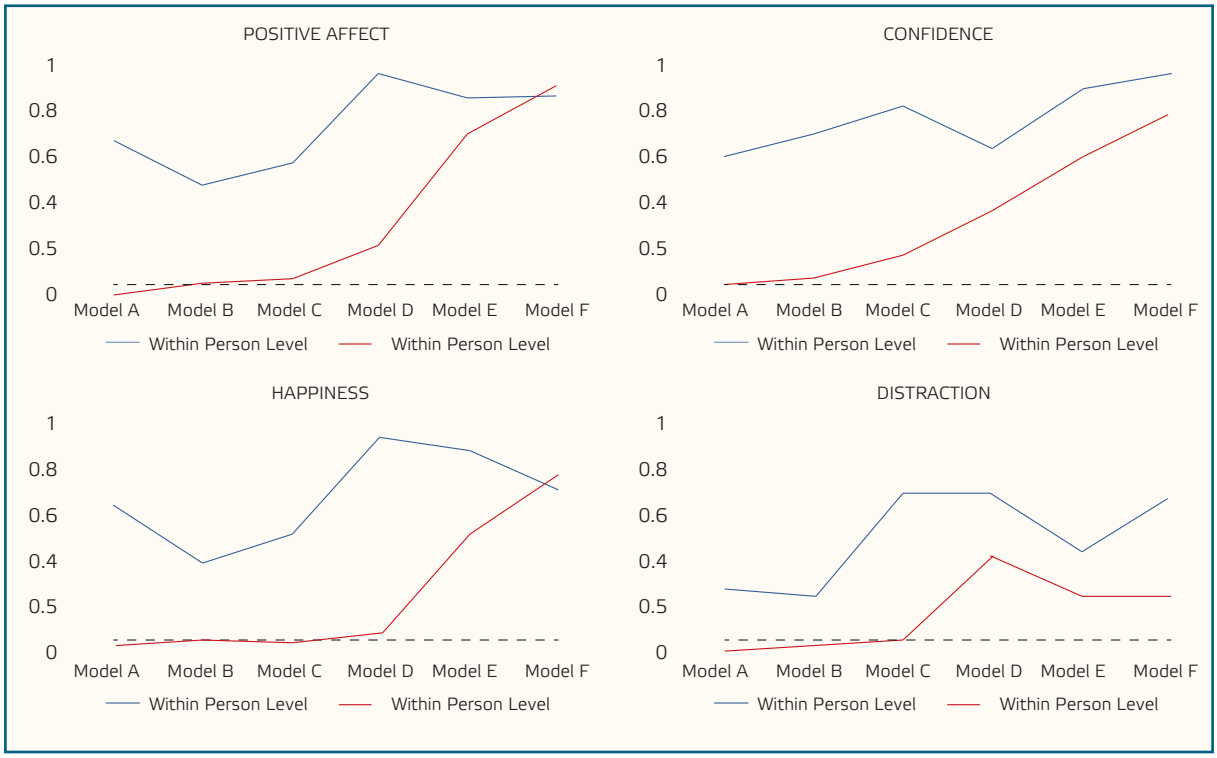
Summary of the Main Outcomes of the Multiverse Analysis Regarding the Within-Person and Between-Person Regressions of Affect, Emotions, and Sleep Duration

	Model A (0 to 22 hours of sleep)				Model B (1 to 21 hours of sleep)			
	Within-person		Between-person		Within-person		Between-person	
	Est.	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.
Positive affect	.12*	.05	-.09	.21	.10*	.05	-.25	.35
Negative affect	-.08	.05	.08	.24	-.07	.06	.22	.42
Confidence	.10*	.05	-.10	.19	.08	.05	-.12	.33
Optimism	.08	.04	-.01	.22	.05	.05	-.24	.36
Happiness	.12*	.05	-.11	.24	.11*	.05	-.29	.34
Fatigue	-.09	.05	.31	.22	-.09	.05	.61	.41
Stress	-.03	.05	.02	.24	-.02	.06	-.05	.42
Distraction	-.14**	.05	.27	.24	-.13*	.05	.50	.43
Worry	-.04	.05	-.06	.28	-.03	.05	-.01	.50
Shame	.08	.05	-.44	.27	.07	.05	-.44	.41
	Model C (2 to 20 hours of sleep)				Model D (3 to 19 hours of sleep)			
	Within-person		Between-person		Within-person		Between-person	
	Est.	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.
Positive affect	.11	.06	-.21	.37	.07	.06	.01	.23
Negative affect	-.07	.06	-.02	.36	-.03	.06	-.14	.23
Confidence	.08	.06	-.07	.34	.05	.06	.11	.22
Optimism	.06	.05	-.27	.38	.00	.05	-.06	.24
Happiness	.13	.06	-.23	.35	.12	.07	-.02	.23
Fatigue	-.08	.05	.49	.36	-.04	05	.24	.26
Stress	-.01	.05	-.32	.35	-.02	.06	-.31	.24
Distraction	-.12*	.06	.16	.41	-.05	.06	-.11	.27
Worry	-.04	.05	-.19	.42	-.03	.06	-.26	.28
Shame	.05	.05	-.48	.36	.07	.05	-.45	.23
	Model E (4 to 18 hours of sleep)				Model F (5 to 17 hours of sleep)			
	Within-person		Between-person		Within-person		Between-person	
	Est.	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.
Positive affect	.02	.06	-.04	.20	.01	.06	-.03	.17
Negative affect	.00	.07	.08	.20	-.01	.06	.05	.17
Confidence	.03	.06	-.02	.20	.02	.06	.01	.16
Optimism	-.03	.06	-.09	.20	-.03	.06	-.15	.17
Happiness	.05	.07	.03	.20	.02	.07	.06	.17
Fatigue	-.05	.06	.26	.21	-.11*	.06	.24	.19
Stress	.04	.07	-.09	.22	.05	.07	-.08	.18
Distraction	-.08	.07	.17	.21	-.07	.06	.07	.18
Worry	.03	.07	-.06	.25	.07	.07	-.11	.21
Shame	.09	.05	-.18	.23	.07	.05	-.03	.22

Est. = standardized effects using STDYX standardization in Mplus; S.E. = standard errors of the parameter estimates using STDYX standardization in Mplus; significance based on two-sided p values of the unstandardized effects: * = $p < .050$, ** = $p < .010$

Appendix B

Line Chart of Unstandardized p Values of the Correlations Between Positive Affect, Confidence, Happiness, and Distraction with Sleep Duration



Note: The dashed line indicates p = .050.

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RESEARCH ARTICLE

The Psychological Immune Competence Inventory: A Pilot Validation Study in Slovakia

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Introduction: Psychological immunity refers to an individual's potential to cope with psychological risk factors, as well as to promote and maintain mental health and well-being. The method of its measurement is the Psychological Immune Competence Inventory (PICI), which appears to have good psychometric parameters. Despite the use of translated versions in various foreign studies, the authors have found no studies verifying its factor structure or reliability.
Aims: In this article, our objective is to present the results of the PICI pilot validation in Slovakia. The Slovak version of PICI was expected to have psychometric properties comparable to those of the original version.
Methods: We collected data from a research sample of 213 healthcare students (162 women and 51 men) aged 19 to 35 years (M = 21.18; SD = 2.81), and validated the internal structure of the inventory using Structural Equation Modeling (SEM) via employing the DWLS estimation method. The convergent validity of individual factors was further verified by correlation with personality traits, psychopathological symptoms, preferred coping strategies and trait emotional intelligence.
Results: The results of the second-order confirmatory analysis indicate an acceptable fit of the original model to our data. The convergent validity of the observed individual psychological immunity factors was also supported.
Conclusions: The Slovak version of PICI showed promising psychometric properties. The research serves as a reference to Slovak standardization. Nevertheless, further validation is recommended in a representative sample.

Keywords: psychological immunity, Psychological Immune Competence Inventory, PICI, validation, SEM, Slovak version

Introduction

The past five decades have seen an increased interest in developing new mental health paradigms that extend the biomedical model of disease. The increasing emphasis on prevention, as well as the early identification and promotion of protective factors, has accelerated attempts to introduce specific concepts of health psychology, such as resilience (Block & Block, 1980), coping (Carver, 1997; Lazarus & Folkman, 1984), self-efficacy (Bandura, 1977), a sense of coherence, or salutogenesis (Antonovsky, 1979). There are also clear efforts to develop more comprehensive and applicable models in the field of mental health. Hungarian psychologist A. Oláh (2021) introduced a theoretical model of the psychological immune system to integrate the individual's various adaptive and protective competences into a coherent relational framework.

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Although the concept of psychological immunity has not been conceptualized consistently (Bhardwaj & Agrawal, 2015; Biela et al., 2015; Gilbert et al., 1998), most authors agree that it can be regarded as a psychological equivalent to the biological immune system protecting individuals against psychological risks (Kaur & Som, 2020; Rosenzweig, 2016). Oláh (2021) conceptualized psychological immunity as a set of competences that serve to increase frustration tolerance, foster effective stress reduction, and promote mental health. It includes protective and supportive variables (Kaur & Som, 2020). The protective component largely operates automatically at the unconscious level. The second, proactive component, is conscious and intervenes deliberately to promote the healing process. Both components are influenced by cognitive variables. This differs from the early conceptualization of psychological immunity as being unconscious processes of transforming, ignoring, and rearranging reality, aimed at reducing and neutralizing the consequences of adverse events (Gilbert et al., 1998). Accordingly, former conceptualizations do not work with the idea of proactively and intentionally enhancing the capacity to cope. Attaran et al. (2019) suggest that psychological immunity is a dynamic social-psychological construct that interpersonal relationships form. According to the authors (ibidem), individuals are active agents in shaping and developing their own defenses. They define three key procedures: threat recognition, response generation, and self-regulation.

Bhardwaj and Agrawal (2015) proposed a different model of psychological immunity. Their five-factor model consists of self-confidence, adaptability, emotional maturity, mental well-being, and positive memories of the past. Biela et al. (2015) established a four-component psycho-immunological structure consisting of: strength and will of meaningful life (a joy for life and the ability to see meaning in life); a sense of competence in coping (coping approach to challenges of life); a social support and proactivity (inclusion in a supportive social environment in which one can participate effectively and assertively); and autonomous goals (significant values and interests).

Compared to these conceptualizations of psychological immunity, Oláh (2021) presents a more comprehensive model. It includes analogies to established constructs such as hardiness (Kobasa et al., 1982), self-actualization (Rogers, 1959), self-efficacy (Bandura, 1977), sense of coherence (Antonovsky, 1979), ego-resiliency (Block & Block, 1980), learned optimism (Seligman, 1991), or internal locus of control (Rotter, 1966) and organizes these within a meaningful theoretical framework. The concept of psychological immunity resembles the concept of resilience, albeit more complex. Unlike resilience, which has no consensus on the work definition (Herrman et al., 2011), psychological immunity is clearly defined by specific personality resources. Additionally, the psychological immune system (Oláh, 2021) refines the transactional model of Lazarus (1966) and Lazarus and Folkman (1984) by specifying the cognitive, motivational, and behavioral dimensions that are responsible for the primary and secondary appraisal of potential stressors and coping abilities.

Oláh (2021) has also developed a psychological immunity assessment instrument known as the Psychological Immune Competence Inventory (PICI). The PICI inventory has a high application potential to identify vulnerable individuals and capture impaired competences to cope with stress as well as protective variables using personalized profiles.

Factor structure of the Psychological Immune Competence Inventory

The 80-item Psychological Immune Competence Inventory (Oláh, 2021) contains 16 factors merged into three subsystems:

A) Approach-Belief subsystem (ABS);
B) Monitoring-Creating-Executing subsystem (MCES);
C) Self-regulating subsystem (SRS).

The approach-belief subsystem is responsible for the primary appraisal process to assess situations as potentially stressful. It controls the attitude of individuals toward self and the environment and directs the tendency to approach or avoid the demands of life and self-actualization. Therefore, the subsystem contains: positive thinking (personality dimensions that facilitate positive anticipations in situations beyond personal control); sense of control (attitude toward perceived control over life circumstances); sense of coherence (belief of meaningfulness, comprehensibility and manageableness of life) and sense of self-growth (individual's stable belief in their own ability to continually improve).

The monitoring-creating-executing subsystem, responsible for the secondary appraisal process of evaluating coping options when facing potential stressors, includes variables related to the exploration of challenges and new experiences, variables needed to actualize the internal and social resources, and executive variables that are related

to the creation of alternative solutions. These are: creative self concept (individual's strong belief in their own creative potential, self-worth, and the value of their achievements); self-efficacy (expectation of being able to achieve the desired results); goal orientation (ability to maintain motivation and endurance in completing tasks, despite obstacles); problem-solving capacity (ability to reconstruct learned experiences to create alternative solutions); change and challenge orientation (openness to new experiences, and the perception of change as an opportunity); social monitoring capacity (sensitive and selective observation, along with the use of social or environmental information to achieve future goals), social mobilizing capacity (ability to manage human resources to achieve future goals) and social creation capacity (personal influence on creating social groups, based on inspirational ideas).

The third, the self-regulating subsystem, ensures the stability of the whole system by regulating intrapsychic tension that would interfere with the desired goals and contains the following variables: synchronicity (the ability to be in congruence with the current external environment or task, while maintaining concentration); impulse control (ability to manage an individual's own behavior by means of rational control over spontaneous and impulsive action); emotional control (ability to regulate negative emotions that are induced by the anticipation of failure) and irritability control (ability to constructively regulate the impatience and anger resulting from unmet needs).

The psychometric properties of the inventory's original Hungarian version have been validated in a series of studies (Oláh, 2021) and demonstrate solid results. The Cronbach's alphas and test-retest correlations in the sample of 1612 respondents (735 women and 877 men) exhibited high reliabilities. The reliability of the subscales ranged from α = .62 to .80 (M = .73), indicating good internal consistency. The high test-retest stability after two weeks was confirmed by correlations ranging from .77 to .89 (M = .84). In cross-sectional studies, the convergent and discriminant validity of the 16 factors was confirmed by correlations with personality traits, ego-resiliency, coping style, emotional intelligence, burnout syndrome, and psychopathological symptoms (Oláh, 2021). The exploratory factor analysis evaluated the internal structure of the inventory in a sample of 1,679 respondents (850 women and 829 men), which was subsequently validated by confirmatory factor analysis in a sample of 1,073 respondents (452 men and 621 women).

Rationale and Objectives

Previous research has shown that psychological immunity predicts the level of performance satisfaction (Bóna, 2014) and is positively associated with life satisfaction (Voitkāne, 2004). The relationship between coping and psychological immunity in healthcare professionals has also been proven (Dubey & Shahi, 2011). The authors (ibidem) found that active coping was positively correlated with all three subsystems. Bodys-Cupak et al. (2016) found that people with a high sense of self-efficacy prefer active coping, planning, and positive reframing in stressful situations. Furthermore, active coping is classified as part of the problem-focused coping style (Carver, 1997; Litman, 2006) and is orientated toward active problem-solving. The monitoring-creating-executing and self-regulating subsystems are also positively linked to flow experience (Albert-Lőrincz et al., 2011). Psychological immunity has been shown to be a protective factor against burnout syndrome (Gombor, 2009). Within the context of psychopathology, previous research on psychological immunity has shown a negative relationship between depression and the three subsystems of psychological immunity (Voitkāne, 2004). One of the commonest comorbidities is that of depression and anxiety (Ballenger, 2000) both of which are associated with repetitive negative thinking (Luca, 2019) and negative appraisals of the individual's ability to cope with challenging situations (Tahmassian & Moghadam, 2011).

Although translated versions of the PICI have been used in foreign countries (Dubey & Shahi, 2011; Voitkāne, 2004), there is a lack of evidence regarding their psychometric parameters or an adaptation process. Despite the inventory's perceived utility, it was studied primarily in Hungary (Oláh, 2021). To our knowledge, to date no one has studied the concept of psychological immunity within the social and cultural context of the Slovak Republic. This study seeks to explore the factor structure of the Slovak version of PICI and verify its psychometric characteristics in a pilot study. In our research, we expected the Slovak version of PICI to have the appropriate psychometric properties.

In the context of convergent validity, we hypothesized that psychological immunity and its three subsystems would correlate positively with the resilient personality type that is characterized as an optimal constellation of personality traits in terms of coping (Asendorpf & Denissen, 2006; Oshio et al., 2018). We anticipated positive relationships with openness to experience, extraversion, agreeableness and conscientiousness, and negative relationship with neuroticism. We also hypothesized a negative correlation between overall psychological immunity and its subsystems as well as the actual psychopathological burden.

At the level of individual psychological immunity factors, we expected associations with selected coping strategies and with factors of emotional intelligence. More specifically, for coping strategies, we proposed a positive relationship between active coping and the selected psychological immunity factors: goal orientation, self-efficacy, and problem-solving capacity. Due to the similarity between the operational definitions of both constructs, we expected a positive correlation between active coping and the problem-solving capacity of the psychological immune system. Similarly, due to semantic proximity, we also expected a positive relationship between the positive reframing coping strategy and the psychological immunity factor of positive thinking defined as the facilitation of positive expectations. Within the context of emotional intelligence, it was expected that the self-control factor of the trait emotional intelligence would be positively correlated with emotional control and irritability control within the self-regulating subsystem. Furthermore, it was expected that the sociability factor of emotional intelligence, which represents effective communication and interpersonal skills, would be positively associated to those factors of psychological immunity related to soft social skills: social monitoring capacity, social mobilizing capacity, and social creation capacity. The well-being factor of the trait emotional intelligence represents perceived personal well-being, meaningfulness in life, and self-esteem; hence, it is conceptually close to the factors of positive thinking, creative self concept, and sense of coherence of psychological immunity. Consequently, a positive correlation was expected between well-being and the factors of psychological immunity listed above. At the same time, we expected associations with selected symptoms of psychopathology. Since depression and anxiety are related to an overwhelming burden, it can be expected that both are negatively linked to personal abilities to overcome psychological adversity or to protect oneself against stress, such as positive thinking, sense of coherence, sense of self-growth, creative self-concept, synchronicity and emotional control.

Methods

Participants and Data Collection

The final research sample consisted of 213 participants aged 19 to 35 years (M = 21.18; SD = 2.81). Of these, 76.1% were women (n = 162) and 23.9% were men (n = 51). Participants were healthcare students from the Slovak Medical University in the first and third years of their university studies. We conducted the survey in November 2021. The test battery was administered in paper-and-pencil format in groups during a lecture. Participants fully completed all surveys and there were no missing data. The study was carried out according to the ethical principles of psychological research and the Declaration of Helsinki (World Medical Association, 2013). Participants signed an informed consent form and participated voluntarily without compensation. Data are stored in coded databases without personal data, and the authors have policies in place to keep data secure. The research was reviewed and approved by the Slovak Medical University.

Measures

The Psychological Immune Competence Inventory

The Psychological Immune Competence Inventory (Oláh, 2021) consists of 80 items that load 16 factors, which are merged into three subsystems. Each item is answered by a four-point Likert-type scale. The Slovak version of the inventory was translated from the English version of PICI (Oláh, 2021) using a standard back-translation technique (Cha et al., 2007), with the author's approval. Three researchers provided the translation independently. After discussion, a consensus was reached on the final version. Another professional psychologist, an English expert, provided the back-translation. The back-translated version was compared to the original English instrument with a high degree of concept equivalence. In this study, Cronbach's alphas for the particular scales are as follows: Global level of Psychological Immunity (α = .94); Approach-Belief subsystem (α = .84); Monitoring-Creating-Executing subsystem (α = .89); Self-regulating subsystem (α =.85); Positive Thinking (α = .80), Sense of Control (α = .55), Sense of Coherence (α = .74), Sense of Self-Growth (α = .66), Creative Self Concept (α = .72), Self-Efficacy (α = .70), Goal Orientation (α = .77), Problem-Solving Capacity (α = .77), Change and Challenge Orientation (α = .79), Social Monitoring Capacity (α = .75), Social Mobilizing Capacity (α = .77), Social Creation Capacity (α = .77), Synchronicity (α = .70), Impulse Control (α = .65), Emotional Control (α = .78) and Irritability Control (α = .73).

The NEO-FFI

The NEO-FFI (Costa & McCrae, 1992) is based on the five-factor personality model. The answers are given on a five-point Likert-type scale. The Slovak version of the inventory was standardized by Ruisel and Halama (2007) and is available from the publisher. In this study, Cronbach's alphas for the particular scales are as follows: Neuroticism (α = .85), Extraversion (α = .84), Openness to experience (α = .71), Agreeableness (α = .72), and Conscientiousness (α = .85).

The SCL-90®-S

The SCL-90®-S (Franke, 2014) is a 90-item inventory designed to assess the current psychological burden through subjectively perceived physical and psychological symptoms of nine factors (Hostility, Anxiety, Depression, Paranoid Ideation, Phobic Anxiety, Psychoticism, Somatisation, Interpersonal Sensitivity, and Obsessive-Compulsive Symptoms), measuring three global indexes. Items are answered on a five-point Likert-type scale according to the severity of the symptom. The version used in recent research was standardized by Pulkrabková (2020) and is available from the publisher. In the present study, the reliability of the subscales used is as follows: Depression (α = .91), Anxiety (α = .89), and the Global Severity Index (α = .98).

The Brief-COPE Inventory

The Brief-COPE Inventory (Carver, 1997; Hegarty & Buchanan, 2021) is used to identify three coping styles and 14 coping strategies. The short version of the inventory has 28 items that are answered on a four-point Likert-type scale. The inventory was translated by the first two authors from the original English version and back-translated by the third author to achieve concept equivalence. In the present study, the estimates of Cronbach's alphas are as follows: A) Problem-focused coping (α = .78): Active coping (α = .72), Use of instrumental support (α = .78), Positive reframing (α = .65), Planning (α = .68); B) Emotion-focused coping (α = .56): Use of emotional support (α = .73), Venting (α = .31), Humour (α = .91), Acceptance (α = .44), Religion (α = .87), Self-blame (α = .57); and C) Avoidant coping (α = .67): Self-distraction (α = .74), Denial (α = .53), Substance use (α = .86), and Behavioural disengagement (α = .68).

The TEIQue-SF

The TEIQue-SF (Petrides, 2009), standardized in the Slovak language by Kaliská et al. (2015), is a questionnaire designed to measure the total score of trait emotional intelligence and four sub-factors. The questionnaire consists of 30 items that are answered on a seven-point Likert-type scale. In the present study, the reliability of the subscales used is as follows: Emotional intelligence (α = .89), Well-being (α = .85), Self-control (α = .71), Emotionality (α = .66) and Sociability (α = .57).

Statistical Analysis

Data were processed using the JASP statistical program, version 0.17.2 (JASP Team, 2023). In the first step, we checked the internal consistency of the Slovak version of the Psychological Immune Competence Inventory (PICI) using Cronbach's alpha. To verify the factorial validity of the inventory, we performed a second-order confirmatory factor analysis using structural equation modeling (SEM). Finally, to test the convergent validity, the PICI subscales were correlated with the Big Five personality traits, perceived psychopathological symptoms, preferred coping strategies and facets of trait emotional intelligence.

The data obtained from the responses to the four-point Likert-type scale of the validated instrument were treated as ordinal variables. This decision would appear to be the most suitable because data measured by a Likert-type scale can be considered as interval variables if the scale is longer (Asún et al., 2016), respectively, it has more than five categories (Harpe, 2015) and ideally 11 (Wu & Leung, 2017).

Parameter estimates were based on a polychoric correlation matrix, using the diagonally weighted least squares method (DWLS) with robust corrections to standard errors. This method of model estimation appears to be more suitable than the maximum likelihood method (ML) for ordinal variables, assuming a normal distribution of the latent variables rather than the observed variables (Li, 2016). Furthermore, in the confirmatory factor analysis of models with ordinal variables, the DWLS method is characterized by more accurate

chi-square test values, lower standard errors in parameter estimates, and a better performance of the different fit indices (DiStefano et al., 2019). This method was also chosen because neither the exact tests nor the skewness and kurtosis values (Z scores within ±1.96) confirmed the normal distribution of the data (Hair et al., 2006). Finally, the use of this method is suitable for the validation of models with a larger number of items or latent variables and with a smaller research sample (DiStefano et al., 2019; Flora & Curran, 2004), as well as for shorter ordinal scales (Soukup, 2021). In the model estimation, we employed the available case analysis (pairwise deletion), as recommended by Asparouh and Muthén (2010). To evaluate the fit of the model to the research data, the chi-square test (χ^2), the chi-square and degrees of freedom ratio (χ^2/df), and five model fit indices were used: root mean square error of approximation (RMSEA); standardized root mean squared residual (SRMR); comparative fit index (CFI); Tucker-Lewis index (TLI); and parsimonious normed fit index (PNFI).

The chi-square and degrees of freedom ratio (χ^2/df) indicates an acceptable fit of the model to the research data if its value is less than three. The root mean square error of approximation value (RMSEA) as well as the standardized root mean squared error residual value (SRMR) are expected to be less than .08 for a fair model fit and less than .05 for an excellent model fit (Mindrila, 2010). Hu and Bentler (1999) defined the cut-off scores of the comparative fit index (CFI) and the Tucker-Lewis Index (TLI) for a good model fit as those greater than .95, and those greater than .9 for an acceptable fit. However, these are the cut-off scores for the maximum likelihood method (ML), which is suitable for interval variables. Although these CFI and TLI cut-off values are often used in studies applying the DWLS method, an ongoing debate continues on the evaluation of model fit based on these values when using DWLS. It is recommended to use CFI and TLI values above .99 (Xia & Yang, 2019), or rather to rely on the value of the SRMR index, which is independent of the estimation method (Shi & Maydeu-Olivares, 2020). The optimal suggested value of the parsimonious normed fit index (PNFI) is more than .75 in a research sample of 150 participants and more than .76 in a sample size of 250 participants (Sivo et al., 2006).

In the context of factor loading, Hair et al. (2006) pointed out that the sample size influences its magnitude and, for samples consisting of 200 participants, they set the acceptable factor loading cut-off value at .40. Despite that, they recommend a cut-off point of .50 and ideally .70, irrespective of the sample size. However, items with a factor loading greater than .45 can be considered as acceptable, greater than .55 as good, greater than .63 as very good, and those greater than .71 as excellent (Haugan et al., 2020; Sharma, 1995).

Results

Based on the reliability analysis, satisfactory reliability values were found for the global level of psychological immunity (α = .94), all the subsystems (α ranging from .84 to .89) and for most of the factors. The data do not show sufficient reliability for three factors of the Slovak version of PICI: Sense of Control (α = .55), Sense of Self-Growth (α = .66) and Impulse Control (α = .65). The Cronbach's alphas for the other individual factors range from .70 to .80.

Confirmatory Factor Analysis

The results of the confirmatory factor analysis using SEM show that the original second-order factor structure of the model (Model 1) fits fairly to the data due to the absolute indexes (RMSEA = .072; SRMR = .094; χ^2 = 6409.315; df = 3061; χ^2/df = 2.09), incremental indexes (CFI = .930; TLI = .927), and even the parsimonious normed fit index (PNFI = .847). Standardized factor loadings for the original two-level model with 16 first-order factors and 3 second-order factors (Model 1) are presented in Table 2, and intercorrelations of the factors are reported in Table 3.

In addition to the original model (Model 1), we also analyzed a modified model to improve its fit indices. Therefore, items with a standardized factor loading below 0.45 were removed (Model 2). Specifically, 14 items were deleted with the following sequence: 14, 62, 34, 80, 78, 18, 2, 50, 44, 37, 9, 77, 53, 28. The confirmatory factor analysis shows a slightly better fit of the modified model to our data than the original model, due to the absolute indexes (RMSEA = .068; SRMR = .090; χ^2 = 4089.712; df = 2060; χ^2/df = 1.99), incremental indexes (CFI = .952; TLI = .950), and even the parsimonious normed fit index (PNFI = 0.871). The modified model indicates a sig-

Table 1. Descriptive statistics of factors in the Slovak version of the PICI inventory

	M	*SD*	*SK*	*Std. Err. SK*	*KU*	*Std. Err. KU*	*S-W*	*p*
Positive Thinking	15.13	3.29	-0.52	0.17	-0.51	0.33	0.95	< .001
Sense of Control	14.13	2.53	-0.04	0.17	-0.07	0.33	0.98	.002
Sense of Coherence	15.49	3.08	-0.62	0.17	-0.28	0.33	0.95	< .001
Sense of Self-Growth	13.74	3.04	-0.25	0.17	-0.05	0.33	0.98	.009
Creative Self Concept	15.13	2.95	-0.54	0.17	-0.17	0.33	0.96	< .001
Self-Efficacy	13.94	3.36	-0.22	0.17	-0.46	0.33	0.98	.003
Goal Orientation	14.54	3.15	-0.32	0.17	-0.35	0.33	0.98	< .001
Problem-Solving Capacity	14.55	2.79	-0.28	0.17	-0.46	0.33	0.97	< .001
Change and Challenge Orientation	13.85	2.91	-0.10	0.17	-0.02	0.33	0.98	.008
Social Monitoring Capacity	13.06	2.96	0.21	0.17	-0.29	0.33	0.98	.003
Social Mobilizing Capacity	15.42	3.29	-0.41	0.17	-0.71	0.33	0.95	< .001
Social Creation Capacity	12.79	2.96	0.08	0.17	-0.11	0.33	0.98	.016
Synchronicity	11.43	3.28	0.01	0.17	-0.68	0.33	0.98	< .001
Impulse Control	13.57	3.20	-0.44	0.17	0.01	0.33	0.97	< .001
Emotional Control	12.27	3.57	-0.22	0.17	-0.68	0.33	0.97	< .001
Irritability Control	12.68	3.46	-0.11	0.17	-0.81	0.33	0.98	< .001

Note. M – Mean; *SD* – Standard Deviation; *SK* – Skewness; *Std. Err. SK* – Standard Error of Skewness; *KU* – Kurtosis; *Std. Err. KU* – Standard Error of Kurtosis; *S-W* – Shapiro-Wilk test; *p* – p value of the Shapiro-Wilk test.

nificant difference from the original model ($\Delta\chi^2$ = 2319.603; Δdf = 1001; p < .001). However, after removing the problematic items, an insufficient number of items was left in two factors (one item in the Sense of Control and two items in the factor of Impulse Control). Furthermore, this modification has unfavorably affected the reliability of individual factors. Specifically, the estimates of Cronbach's alphas for these factors are as follows: Sense of Self-Growth (α = .58), Self-Efficacy (.69), Synchronicity (.63), Impulse Control (.48) and Irritability Control (.72). Since in the Sense of Control factor, only one item remained after the modification, it was not possible to calculate its reliability.

Convergent Validity

To examine convergent validity, the correlation between the global psychological immunity level (GPI), including its three subsystems (ABS, MCES, SRS), and the Big Five personality traits (neuroticism, extraversion, openness to experience, agreeableness, conscientiousness), the general psychological burden of subjectively perceived symptoms of psychopathology (GSI), the general level of emotional intelligence (EI) and well-being (WB) were examined. We present the results in Table 4. The hypothesized negative correlation between psychological immunity and neuroticism, along with the positive correlation with the other four personality factors, was partially supported. The results support a moderate to strong negative correlation of neuroticism with global psychological immunity (GPI) and also its subsystems (ranging from -.76 to -.53). A positive relationship with extraversion and conscientiousness was also supported (ranging from .35 to .62). Agreeableness exhibited a weak correlation with psychological immunity (ranging from .15 to .33), and openness to experience did not correlate at all. Psychological immunity showed a significant negative relationship with general psychological burden (ranging from -.36 to -.61), as well as moderate to strong positive relationships with emotional intelligence and well-being (ranging from .46 to .79).

Table 2. Standardized factor loadings for the original two-level model with 3 second-order factors (subsystems) and 16 first-order factors (Model 1)

Subsystem	Factor	Item number (standardised factor loading)				
Approach-Belief subsystem	Positive Thinking (.92)	1 (.63)	17 (.63)	33 (.77)	49 (.78)	65 (.82)
	Sense of Control (.67)	2 (.45)	18 (.39)	34 (.05)	50 (.56)	66 (.76)
	Sense of Coherence (.91)	3 (.65)	19 (.61)	35 (.85)	51 (.45)	67 (.75)
Monitoring-Creating-Executing subsystem	Sense of Self-Growth (.92)	5 (.53)	21 (.76)	37 (.44)	53 (.43)	69 (.64)
	Creative Self Concept (1.06)	4 (.63)	20 (.66)	36 (.67)	52 (.54)	68 (.70)
	Self-Efficacy (.93)	9 (.43)	25 (.56)	41 (.56)	57 (.82)	73 (.65)
	Goal Orientation (.67)	13 (.71)	29 (.62)	45 (.81)	61 (.88)	77 (.43)
	Problem-Solving Capacity (.72)	8 (.53)	24 (.60)	40 (.82)	56 (.70)	72 (.76)
	Change and Challenge Orientation (.70)	6 (.61)	22 (.75)	38 (.75)	54 (.80)	70 (.70)
	Social Monitoring Capacity (.32)	7 (.77)	23 (.60)	39 (.79)	55 (.57)	71 (.54)
	Social Mobilizing Capacity (.58)	10 (.81)	26 (.82)	42 (.65)	58 (.53)	74 (.76)
	Social Creation Capacity (.68)	11 (.76)	27 (.72)	43 (.75)	59 (.48)	75 (.72)
Self-regulating subsystem	Synchronicity (.92)	12 (.54)	28 (.45)	44 (.42)	60 (.88)	76 (.75)
	Impulse Control (.83)	14 (.04)	30 (.60)	46 (.82)	62 (.33)	78 (.41)
	Emotional Control (.896)	15 (.63)	31 (.62)	47 (.75)	63 (.55)	79 (.89)
	Irritability Control (.50)	16 (.53)	32 (.75)	48 (.68)	64 (.80)	80 (.35)

Table 3. Intercorrelations of factors in the Slovak version of the PICI inventory

	GPI	ABS	MCES	SRS	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16
GPI	-																			
ABS	.87**	-																		
MCES	.90**	.71**	-																	
SRS	.78**	.59**	.50**	-																
F1	.78**	.84**	.67**	.54**	-															
F2	.40**	.52**	.39**	.16*	.29**	-														
F3	.70**	.84**	.55**	.49**	.63**	.27**	-													
F4	.66**	.75**	.50**	.53**	.50**	.15*	.59**	-												
F5	.63**	.50**	.70**	.37**	.50**	.27**	.37**	.34**	-											
F6	.29**	.16*	.42**	.07	.18**	.17*	.12	-.00	.15*	-										
F7	.61**	.51**	.53**	.52**	.40**	.26**	.40**	.46**	.27**	-.02	-									
F8	.80**	.73**	.80**	.49**	.67**	.37**	.62**	.51**	.52**	.24**	.41**	-								
F9	.60**	.38**	.71**	.35**	.40**	.20**	.29**	.26**	.45**	.32**	.30**	.57**	-							
F10	.69**	.65**	.72**	.36**	.48**	.44**	.50**	.56**	.41**	.17*	.53**	.60**	.41**	-						
F11	.54**	.43**	.59**	.31**	.41**	.22**	.35**	.29**	.36**	.20**	.21**	.38**	.17*	.33**	-					
F12	.58**	.38**	.73**	.26**	.44**	.20**	.29**	.21**	.44**	.33**	.18**	.52**	.64**	.45**	.36**	-				
F13	.66**	.63**	.44**	.72**	.54**	.19**	.52**	.61**	.30**	.01	.39**	.49**	.20**	.43**	.29**	.20**	-			
F14	.46**	.36**	.25**	.68**	.32**	.23**	.27**	.26**	.10	.06	.33**	.29**	.23**	.21**	.10	.09	.32**	-		
F15	.69**	.52**	.50**	.81**	.50**	.09	.43**	.50**	.40**	.03	.44**	.48**	.41**	.32**	.28**	.31**	.59**	.37**	-	
F16	.45**	.26**	.28**	.69**	.26**	.04	.26**	.17*	.25**	.11	.30**	.19**	.21**	.14*	.17*	.17*	.24**	36**	.41**	-

Note. *GPI* – Global level of psychological immunity; *ABS* – Approach-Belief subsystem, *MCES* – Monitoring-Creating-Executing subsystem; *SRS* – Self-regulating subsystem; *F1* – Positive Thinking ; *F2* – Sense of Control; *F3* – Sense of Coherence ; *F4* – Sense of Self-growth ; *F5* – Change and Challenge Orientation ; *F6* – Social Monitoring Capacity ; *F7* – Goal Orientation ; *F8* – Creative Self Concept; *F9* – Problem-Solving Capacity; *F10* – Self-Efficacy; *F11* – Social Mobilizing Capacity ; *F12* – Social Creation Capacity; *F13* – Synchronicity ; *F14* – Impulse Control; *F15* – Emotional Control; *F16* – Irritability Control.

*. Correlation significant at .05 level (2-tailed).
**. Correlation significant at .01 level (2-tailed).

Table 4. Correlation matrix of examined second-order PICI variables

	N	E	*O*	*A*	*C*	*GSI*	*EI*	*WB*
GPI *CI 95%*	-.73** [-.78, -.66]	.60** [.51, .68]	.13 [-.01, .26]	.25** [.12, 37]	.54** [.44, 63]	-.53** [-.62, -.43]	.79** [.74, .84]	.72** [.65, 78]
ABS *CI 95%*	-.64** [-.71, -.55]	.52** [.41, .61]	.09 [-.04, .23]	.23** [.10, .35]	.56** [.46, .64]	-.48** [-.58, -.37]	.73** [.66, .78]	.73** [.66, .79]
MCES *CI 95%*	-.53** [-.62, -.42]	.62** [.53, .70]	.17 [.09, .30]	.15 [.02, .28]	.51** [.40, .60]	-.36** [-.47, -.24]	.72** [.65, .78]	.67** [.59, .74]
SRS *CI 95%*	-.76** [-.81, -70.]	.36** [.24, .47]	.04 [-.10, .17]	.33** [.20, .44]	.35** [.22, .46]	-.61** [-.69 -.52]	.59** [.49, .67]	.46** [.35, .56]

Note. *GPI* – Global level of psychological immunity; *ABS* – Approach-Belief subsystem, *MCES* – Monitoring-Creating-Executing subsystem; *SRS* – Self-regulating subsystem; *N* – Neuroticism; *E* – Extraversion; *O* – Openness to experience; *A* – Agreeableness, *C* – Conscientiousness, *GSI* - Global severity index referring to the general psychological burden of perceived psychopathological symptoms; *EI* – Emotional intelligence; *WB* – Well-being.

*. Correlation significant at .05 level (2-tailed)
**. Correlation significant at .01 level (2-tailed)

Table 5. Convergent validity of examined first-order PICI factors

PICI factor	Examined converging factor	Spearman's correlation CI 95%
Positive Thinking	Positive reframing (Brief-COPE)	.48** [.37, .58]
	Well-being (TEIQue-SF)	.73** [.67, .79]
	Anxiety (SCL-90®-S)	-.40** [-.50, -.28]
	Depression (SCL-90®-S)	-.56** [-.65, -.46]
Sense of Coherence	Well-being (TEIQue-SF)	.63** [.55, .71]
	Anxiety (SCL-90®-S)	-.33** [-.45, -.21]
	Depression (SCL-90®-S)	-.50** [-.60, -.40]
Sense of Self-Growth	Anxiety (SCL-90®-S)	.36** [-.47, -.23]
	Depression (SCL-90®-S)	-.50** [-.60, -.39]
Creative Self Concept	Well-being (TEIQue-SF)	.53** [.42, .62]
	Anxiety (SCL-90®-S)	-.21* [-.33, - .07]
	Depression (SCL-90®-S)	-.40** [-.51, -.28]
Self-Efficacy	Active coping (Brief-COPE)	.31** [.18, .43]
Goal Orientation	Active coping (Brief-COPE)	.34** [.21, .45]
Problem-Solving Capacity	Active coping (Brief-COPE)	.24** [.10, .36]
Social Monitoring Capacity	Sociability (TEIQue-SF)	.43** [.31, .53]
Social Mobilizing Capacity	Sociability (TEIQue-SF)	.40** [.28, .51]
Social Creation Capacity	Sociability (TEIQue-SF)	.37** [.25, .48]
Synchronicity	Anxiety (SCL-90®-S)	-.49** [-.58, -.38]
	Depression (SCL-90®-S)	-.60** [-.68, -.51]
Emotional Control	Self-control (TEIQue-SF)	.69** [.62, .76]
	Anxiety (SCL-90®-S)	-.56** [-.64, -.46]
	Depression (SCL-90®-S)	-.61** [-.69, -.51]
Irritability Control	Self-control factor (TEIQue-SF)	.43** [.31, .53]

*. Correlation significant at .05 level (2-tailed)
**. Correlation significant at .01 level (2-tailed)

To verify convergent validity at the level of individual psychological immunity factors, we anticipated relationships with selected coping strategies (active coping and positive reframing in Brief-COPE), perceived psychopathological symptoms (depression and anxiety in SCL-90®-S), and factors of emotional intelligence (well-being, self-control, and sociability in TEIQue-SF). Table 5 reports the results. As expected, active coping was positively related to goal orientation, self-efficacy and problem-solving capacity, and positive reframing coping strategy was positively related to positive thinking. The results also supported assumptions about the association of psychological immunity factors with trait emotional intelligence. The anticipated associations were also confirmed in the cases of depression and anxiety.

Discussion

Efforts to identify alternative mental health approaches as opposed to the reductionist biomedical paradigm are attracting increased attention. The comprehensive model of psychological immunity introduced by Oláh (2021) seeks to further this endeavor. It defines psychological immunity in a multidimensional way as a set of personal competences to cope with psychological risk factors, promote mental health and maintain general well-being. The inventory designed to measure psychological immunity appears to be a useful diagnostic tool in the field of healthcare and prevention. Despite its promising potential, it has mainly been studied in Hungary, and psychometric evidence from other countries remains lacking. Hence, our main objective in the present study was to provide evidence regarding the validity of the Slovak version of the Psychological Immune Competence Inventory (Oláh, 2021) in a pilot study.

The values of Cronbach's alpha indicate a high level of reliability for 13 out of a total of 16 factors. The low reliability may be due in part to the fact that, for the purposes of the pilot study presented here, we translated the English version of the inventory. The inventory's psychometric properties may also be affected by the specificity of the research sample. As found in other research (Široká et al., 2023), medical students can perceive an increased psychopathological burden. The mean profile of the psychological immune system can provide useful information on these students' functioning. Our data indicate that healthcare students may have problems in the self-regulating subsystem. However, self-regulating skills are crucial to dealing with patients, using critical thinking, and for meaningful learning. The lowest level was found in the synchronicity factor. This factor is considered as an ability to be mentally present in the moment. Reinforcing the self-regulating competences can contribute to medical students' more adaptive functioning in terms of preventing negative consequences of stress, such as burnout syndrome.

Based on the second-order confirmatory factor analysis, the original model of the psychological immune system proved to be acceptable, although not ideal for our data. Accordingly, we also analyzed a modified model. The removal of problematic items has slightly improved the fit indices. However, this modification has affected the reliability of individual factors unfavorably. Therefore, we suggest using the original model and recommend verifying the psychometric properties of the Slovak version of the PICI inventory on a representative sample.

Within the context of convergent validity, the research conducted to date has supported the negative relationship of psychological immunity with depression (Voitkāne, 2004), psychopathological symptoms (Oláh, 2021) and burnout syndrome (Gombor, 2009) and its selected sections with maladaptive cognitive schemas, experiencing loneliness and negative emotional states (Zábó et al., 2022). On the other hand, psychological immunity has been shown to be positively related to mental and physical health (Oláh, 2021), life satisfaction (Bóna, 2014; Gombor, 2009), life aspirations (Voitkāne, 2004), emotional intelligence (Oláh, 2021), life meaningfulness, and experiencing positive emotions (Zábó et al., 2022).

On a broader perspective, a large amount of scientific evidence has so far supported the partial constructs of the psychological immune system. In the field of identifying protective factors of mental health, research has been well-documented on optimism (Conversano et al., 2010), self-efficacy (Zhou et al., 2021), sense of coherence (Griffiths, 2009) or emotional stability (Aschwanden et al., 2021; Kroencke et al., 2020; Liu et al., 2021). Considerable research interest has also been devoted to the Transactional model of coping with stress (Lazarus, 1966; Lazarus & Folkman, 1984).

In the present study, a statistically significant positive correlation was supported between global psychological immunity (and its three subsystems) and extraversion, conscientiousness, emotional intelligence and well-being. By contrast, a significant negative relationship was indicated with neuroticism and the psychological burden of perceived psychopathological symptoms. These results support the construct validity of psychological immunity.

At the level of psychological immunity factors, we expected convergence with selected coping strategies, perceived burden of psychopathological symptoms and factors of emotional intelligence. In the context of coping strategies, our results support the assumption of a positive relationship between active coping and psychological immunity factors of goal orientation, self-efficacy, and problem-solving capacity. Our results regarding positive relationships between facets of emotional intelligence and factors of the psychological immune system support a view of psychological immunity not only as a defense against psychological risks, but also as a capacity to proactively maintain mental health and well-being. These results are consistent with findings on the association between psychological immunity and mental health (Oláh, 2021), life satisfaction (Voitkāne, 2004) and adaptive functioning (Albert-Lőrincz et al., 2011; Gombor, 2009; Stankovic et al., 2022). The negative correlation of depression and anxiety with selected factors of psychological immunity (positive thinking, sense of coherence, sense of self-growth, creative self-concept, synchronicity and emotional control) points to the applicability of the Slovak version of the PICI in the field of detecting vulnerable individuals with insufficient coping resources.

Strengths and Limitations

The findings of this research should be viewed through the prism of certain limitations, one of which is the composition of the research sample that consists of a specific group of medical students, mostly in early adulthood. The level of psychological immunity is also influenced by developmental factors (Bredács, 2019) and can also vary among students from different disciplines (Bredács & Kárpáti, 2012). Furthermore, the research population was not balanced by gender, biased in favor of women. Possible limitations are due to the translation from the English version of the PICI inventory. In future research, we will perform another translation from the original Hungarian version and refine the Slovak version accordingly.

Further limitations stem from the very nature of cross-sectional studies, which are conducted by self-evaluation methods. Additionally, the verification of psychometric properties would also need to be supplemented by test-retest reliability and also by testing the invariance of the model across different age, educational and ethnic groups, as well as in terms of gender. Given the limitations, we consider the research findings to be beneficial in our particular context, serving as important data for further adapting the Slovak version of the PICI. The study's results also contribute to the topic of the psychological immunity in medical students. The knowledge of strengths and limitations of psychological immunity in healthcare students can be used to plan preventative programmes and interventions to address stress in medical students.

Conclusions, Implications and Future Directions

Psychological immunity is an interdependent system of resource personality factors that protect an individual from the harmful consequences of psychological distress and, at the same time, promote mental health. Our results, regarding the second-order confirmatory analysis, indicate an acceptable fit of the original model to our data. The data also supported the convergent validity of the individual psychological immunity factors observed. However, it would be desirable to verify the results in a representative research sample and through longitudinal follow-up. The psychological immune system model (Oláh, 2021) appears to be a valuable framework for understanding the structure of protective personal competences and possesses significant potential for application. The Psychological Immune Competence Inventory can be used for effective detection and the dispensarization of potentially vulnerable individuals. In addition, personalized profiling can be useful in promoting mental health on the level of individuals, not just by detecting potentially impaired functions, but also by defining resource variables to reinforce specific competences.

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Author contribution
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Declaration of interest statement
The authors declare that they have no conflict of interest.

Ethical statement
This manuscript is the authors' original work.
All participants engaged in the research voluntarily and anonymously.
Their data are stored in coded materials and databases without personal data.
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Data Availability Statement
Datasets presented in this article are available from the corresponding author upon reasonable request.

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References

Antonovsky, A. (1979). *Health, stress, and coping: New perspectives on mental and physical well-being.* Jossey-Bass.

Albert-Lőrincz, E., Albert-Lőrincz, M., Kádár, A., Krizbai, T., & Lukács-Márton, R. (2011). Relationship between the Characteristics of the Psychological Immune System and the Emotional Tone of Personality in Adolescents. *The New Educational Review, 23*(1), 103–111.

Asendorpf, J. B., & Denissen, J. J. (2006). Predictive validity of personality types versus personality dimensions from early childhood to adulthood: Implications for the distinction between core and surface traits. *Merrill-Palmer Quarterly, 52*(3), 486–513. https://doi.org/10.1353/mpq.2006.0022

Asparouhov, T., & Muthén, B. (2010). *Weighted least squares estimation with missing data.* Mplus Technical Appendix.

Aschwanden, D., Strickhouser, J. E., Sesker, A. A., Lee, J. H., Luchetti, M., Stephan, Y., Sutin, A. R., & Terracciano, A. (2021). Psychological and behavioural responses to coronavirus disease 2019: The role of personality. *European Journal of Personality*, *35*(1), 51–66. https://doi.org/10.1002/per.2281

Asún, R. A., Rdz-Navarro, K., & Alvarado, J. M. (2016). Developing Multidimensional Likert Scales Using Item Factor Analysis: The Case of Four-point Items. *Sociological Methods & Research, 45*(1), 109–133. https://doi.org/10.1177/0049124114566716

Attaran, A., Ghonsooly, B., Hosseini Fatemi, A., & Shahriari, H. (2019). Immunology of language learners: A social psychological perspective. *Interchange*, *50*(1), 57–76. https://doi.org/10.1007/s10780-018-9339-0

Ballenger, J. C. (2000). Anxiety and depression: optimizing treatments. *Primary Care Companion to the Journal of Clinical Psychiatry*, *2*(3), 71–79. https://doi.org/10.4088/pcc.v02n0301

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191–215. https://doi.org/10.1037/0033-295X.84.2.191

Bhardwaj, A. K., & Agrawal, G. (2015). Concept and applications of psycho-immunity (defense against mental illness): Importance in mental health scenario. *Online Journal of Multidisciplinary Research, 1*(3), 6–15.

Biela, A., Špajdel, M., Śliwak, J., Bartczuk, R. P., Wiechetek, M., & Zarzycka, B. (2015). The scale of psycho-immunological structure: Assessing factorial invariance in Poland and Slovakia. *Studia Psychologica*, *57*(3), 163–176. https://doi.org/10.21909/sp.2015.03.691

Block, J. H., & Block, J. (1980). The role of ego-control and ego-resiliency in the organization of behavior. In W. A. Collins (Ed.), *Development of cognition, affect and social relations: The Minnesota symposia on child psychology*, Vol. 13, pp. 39–101. Erlbaum.

Bodys-Cupak, I., Majda, A., Zalewska-Puchała, J., & Kamińska, A. (2016). The impact of a sense of self-efficacy on the level of stress and the ways of coping with difficult situations in Polish nursing students. *Nurse Education Today*, *45*, 102–107. https://doi.org/10.1016/j.nedt.2016.07.004

Bóna, K. (2014). *An exploration of the psychological immune system in Hungarian gymnasts.* [Master´s thesis, University of Jyväskylä].

Bredács, A. (2019). A pozitív pedagógia fejlesztési területei – a pszichológiai immunkompetencia és a reziliencia fogalmainak tükrében [The areas developed through positive pedagogy - focusing on psychological immunocompetence and resilience]. *Parlando: Zenepedagógiai Folyóirat, 2.*

Bredács A., & Kárpáti, A. (2012). A 14–16 éves művészeti képzésben részesülő tanulók pszichológiai immunkompetenciája és ennek integrációja a művészeti neveléssel [The psychological immunocompetence of 14-16 year students of arts and its integration into art education]. *Magyar Pedagógia, (112)*4, 197–219.

Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the brief cope. *International Journal of Behavioral Medicine, 4*(1), 92–100. https://doi.org/10.1207/s15327558ijbm0401_6

Cha, E.-S., Kim, K. H., & Erlen, J. A. (2007). Translation of scales in cross-cultural research: Issues and techniques. *Journal of Advanced Nursing*, *58*(4), 386–395. https://doi.org/10.1111/j.1365-2648.2007.04242.x

Conversano, C., Rotondo, A., Lensi, E., Della Vista, O., Arpone, F., & Reda, M. A. (2010). Optimism and its impact on mental and physical well-being. *Clinical Practice and Epidemiology in Mental Health, 6*(1), 25–29. https://doi.org/10.2174/1745017901006010025

Costa, P. T., Jr., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual*. Psychological Assessment Resources.

DiStefano, C., McDaniel, H. L., Zhang, L., Shi, D., & Jiang, Z. (2019). Fitting Large Factor Analysis Models With Ordinal Data. *Educational and Psychological Measurement*, *79*(3), 417–436. https://doi.org/10.1177/0013164418818242

Dubey, A. & Shahi, D. (2011). Psychological Immunity and Coping Strategies: A Study on Medical Professionals. *Indian Journal of Social Science Researches, (8)*1–2, 36–47.

Flora, D. B., & Curran, P. J. (2004). An empirical evaluation of alternative methods of estimation for confirmatory factor analysis with ordinal data. *Psychological Methods*, *9*(4), 466–491. https://psycnet.apa.org/doi/10.1037/1082-989X.9.4.466

Franke, G. H. (2014). *SCL-90®-S. Symptom-Checklist-90®-Standard–Manual*. Hogrefe.

Gilbert, D. T., Pinel, E. C., Wilson, T. D., Blumberg, S. J., & Wheatley, T. P. (1998). Immune neglect: A source of durability bias in affective forecasting. *Journal of Personality and Social Psychology*, *75*(3), 617–638. https://doi.org/10.1037/0022-3514.75.3.617

Gombor, A. (2009). *Burnout in Hungarian and Swedish Emergency Nurses: Demographic Variables, Work-Related Factors, Social Support, Personality, and Life Satisfaction as Determinants of Burnout*. [Doctoral dissertation, University of Eötvös Loránd Hungary, Budapest].

Griffiths, C. A. (2009). Sense of coherence and mental health rehabilitation. *Clinical Rehabilitation*, *23*(1), 72–78. https://doi.org/10.1177/0269215508095360

Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2006). *Multivariate Data Analysis* (6th ed.). Pearson Prentice Hall.

Harpe, S. E. (2015). How to analyze Likert and other rating scale data. *Currents in Pharmacy Teaching and Learning, 7*(6), 836–850. https://doi.org/10.1016/j.cptl.2015.08.001

Haugan, G., Drageset, J., André, B., Kukulu, K., Mugisha, J., & Utvær, B. K. S. (2020). Assessing quality of life in older adults: psychometric properties of the OPQoL-brief questionnaire in a nursing home population. *Health and Quality of Life Outcomes*, *18*(1), 1–14. https://doi.org/10.1186/s12955-019-1245-3

Hegarty, D., & Buchanan, B. (2021). *The Value of NovoPsych Data – New Norms for the Brief-COPE.* NovoPsych. https://novopsych.com.au/news/the-value-of-novopsych-data-new-norms-for-the-brief-cope/

Herrman, H., Stewart, D. E., Diaz-Granados, N., Berger, E. L., Jackson, B., & Yuen, T. (2011). What is resilience? *The Canadian Journal of Psychiatry*, *56*(5), 258–265. https://doi.org/10.1177/070674371105600504

Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

JASP Team (2023). *JASP* (Version 0.17.2) [Computer software].

Kaliská, L., Nábělková, E., & Salbot, V. (2015). *Dotazníky črtovej emocionálnej inteligencie TEIQue-SF/ TEIQue-CSF: manuál k skráteným formám* [Trait Emotional Intelligence Questionnaires TEIQue-SF/ TEIQue-CSF: Short Forms Manual]. Belianum.

Kaur, T., & Som, R. R. (2020). The predictive role of resilience in psychological immunity: A theoretical review. *International Journal of Current Research and Review*, *12*(22), 139–143. https://doi.org/10.31782/ijcrr.2020.122231

Kobasa, S. C., Maddi, S. R., & Kahn, S. (1982). Hardiness and health: A prospective study. *Journal of Personality and Social Psychology*, *42*(1), 168–177. https://doi.org/10.1037/0022-3514.42.1.168

Kroencke, L., Geukes, K., Utesch, T., Kuper, N., & Back, M. D. (2020). Neuroticism and emotional risk during the COVID-19 pandemic. *Journal of Research in Personality*, *89*, Article e104038. https://doi.org/10.1016/j.jrp.2020.104038

Lazarus, R. S. (1966). *Psychological stress and the coping process* (p. 466). McGraw-Hill.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping* (p. 445). Springer.

Li, C.-H. (2016). The performance of ML, DWLS, and ULS estimation with robust corrections in structural equation models with ordinal variables. *Psychological Methods, 21*(3), 369–387. https://doi.org/10.1037/met0000093

Liu, S., Lithopoulos, A., Zhang, C.-Q., Garcia-Barrera, M. A., & Rhodes, R. E. (2021). Personality and perceived stress during COVID-19 pandemic: Testing the mediating role of perceived threat and efficacy. *Personality and Individual Differences*, *168*, Article e110351. https://doi.org/10.1016/j.paid.2020.110351

Litman, J. A. (2006). The COPE inventory: Dimensionality and relationships with approach-and avoidance-motives and positive and negative traits. *Personality and Individual Differences*, *41*(2), 273–284. https://doi.org/10.1016/j.paid.2005.11.032

Luca, M. (2019). Maladaptive rumination as a transdiagnostic mediator of vulnerability and outcome in psychopathology. *Journal of Clinical Medicine*, *8*(3), Article e314. https://doi.org/10.3390/jcm8030314

Mindrila, D. (2010). Maximum Likelihood (ML) and Diagonally Weighted Least Squares (DWLS) Estimation Procedures: A Comparison of Estimation Bias with Ordinal and Multivariate Non-Normal Data. *International Journal of Digital Society*, *1*(1), 60–66. https://doi.org/10.20533/ijds.2040.2570.2010.0010

Oláh, A. (2021). *Anxiety, Coping, and Flow: Empirical studies in interactional perspective*. Trefort.

Oshio, A., Taku, K., Hirano, M., & Saeed, G. (2018). Resilience and Big Five personality traits: A meta-analysis. *Personality and Individual Differences*, *127*, 54–60. https://doi.org/10.1016/j.paid.2018.01.048

Petrides, K. V. (2009). Psychometric properties of the Trait Emotional Intelligence Questionnaire (TEIQue). In C. Stough, D. H. Saklofske, & J. D. A. Parker (Eds.), *Assessing emotional intelligence: Theory, research, and applications* (pp. 85–101). Springer Science + Business Media. https://doi.org/10.1007/978-0-387-88370-0_5

Pulkrabková, A. (2020). *SCL-90®-S. Symptom-Checklist-90®-Standard*. Testcentrum.

Rogers, C. R. (1959). A Theory of Therapy, Personality, and Interpersonal Relationships: As Developed in the Client-Centered Framework. In S. Koch (Ed.), *Psychology: A Study of a Science. Formulations of the Person and the Social Context*, vol. 3, pp. 184-256. McGraw Hill.

Rosenzweig, E. (2016). With Eyes Wide Open: How and Why Awareness of the Psychological Immune System Is Compatible With Its Efficacy. *Perspectives on Psychological Science*, 11(2), 222–238. https://doi.org/10.1177/1745691615621280

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied, 80*(1), 1–28. https://doi.org/10.1037/h0092976

Ruisel, I., & Halama, P. (2007). *NEO päťfaktorový osobnostný inventár* [NEO Five Factor Inventory]. Hogrefe Testcentrum.

Seligman, M. E. P. (1991). *Learned optimism.* Knopf.

Sharma, S. (1995). *Applied multivariate techniques*. John Wiley & Sons, Inc.

Shi, D., & Maydeu-Olivares, A. (2020). The Effect of Estimation Methods on SEM Fit Indices. *Educational and Psychological Measurement*, *80*(3), 421–445. https://doi.org/10.1177/0013164419885164

Sivo, S. A., Fan, X., Witta, E. L., & Willse, J. T. (2006). The Search for "Optimal" Cutoff Properties: Fit Index Criteria in Structural Equation Modeling. *The Journal of Experimental Education*, *74*(3), 267–288. http://dx.doi.org/10.3200/JEXE.74.3.267-288

Stankovic, M., Papp, L., Ivánkovits, L., Lázár, G., Pető, Z., & Töreki, A. (2022). Psychological immune competency predicts burnout syndrome among the high-risk healthcare staff: A cross-sectional study. *International Emergency Nursing*, *60*, Article e101114. https://doi.org/10.1016/j.ienj.2021.101114

Soukup, P. (2021). Faktorová analýza jako známá neznámá (aneb metoda hlavních komponent a varimax nejsou vždy ideální postup) [Factor Analysis as a known unknown – Principal Component Analysis 'with a Varimax rotation Is Not Always the Ideal Approach]. *Sociologický časopis / Czech Sociological Review*, *57*(4), 455–484. https://doi.org/10.13060/csr.2021.021

Široká, K., Antalová, A. & Čechová, D. (2023). Symptómy psychopatológie a ich súvislosť s psychologickou imunitou u študentov zdravotníckych odborov [Psychopathological symptoms and their relationship to psychological immunity in healthcare students]. *Prohuman, 24.* https://www.prohuman.sk/psychologia/symptomy-psychopatologie-a-ich-suvislos-s-psychologickou-imunitou-u-studentov-zdravotnickych-odborov

Tahmassian, K., & Moghadam, N. J. (2011). Relationship between self-efficacy and symptoms of anxiety, depression, worry and social avoidance in a normal sample of students. *Iranian Journal of Psychiatry and Behavioral Sciences*, *5*(2), 91–98.

Voitkāne, S. (2004). Goal Directedness in relation to life satisfaction, psychological immune system and depression in first-semester University students in Latvia. *Baltic Journal of Psychology, 5*(2), 19–31. https://dspace.lu.lv/dspace/bitstream/handle/7/1312/BalticJournPsychol-2004-Vol-5_No-2.pdf?sequence=1&isAllowed=y

World Medical Association (2013). World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA, 310*(20), 2191–2194. https://doi.org/10.1001/jama.2013.281053

Wu, H., & Leung, S. (2017). Can Likert Scales be Treated as Interval Scales? – A Simulation Study. *Journal of Social Service Research, 43*(4), 527–532, https://doi.org/10.1080/01488376.2017.1329775

Xia, Y., & Yang, Y. (2019). RMSEA, CFI, and TLI in structural equation modeling with ordered categorical data: The story they tell depends on the estimation methods. *Behavior Research Methods, 51*, 409–428. https://doi.org/10.3758/s13428-018-1055-2

Zábó, V., Oláh, A., & Vargha, A. (2022). A new complex mental health test in a positive psychological framework. *Frontiers in Psychology*, *13*, Article e5214. https://doi.org/10.3389/fpsyg.2022.775622

Zhou, C., Yue, X. D., Zhang, X., Shangguan, F., & Zhang, X. Y. (2021). Self-efficacy and mental health problems during COVID-19 pandemic: A multiple mediation model based on the Health Belief Model. *Personality and Individual Differences*, *179*, Article e110893. https://doi.org/10.1016/j.paid.2021.110893

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RESEARCH ARTICLE

Stigma and Discrimination Among Professionals in Portuguese Integrated Continuing Care Units: Stigma and Discrimination in ICCUs

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Introduction: Stigma surrounding mental illness (MI) poses a significant obstacle to treatment access, hinders recovery, and may lead to suboptimal care. Breaking the chains of prejudice and embracing tolerance are essential steps in fostering understanding and compassion for those living with MI.
Aims: This study aims to describe the levels of stigma and discrimination against individuals suffering from MI among professionals in Portuguese Integrated Continuing Care Units (ICCUs).
Methods: A quantitative, observational, cross-sectional study involving 163 participants utilized a sociodemographic questionnaire, alongside two assessment instruments – the Attribution Questionnaire (AQ-27) and Community Attitudes Toward Mental Illness (CAMI).
Results: Results revealed significant differences in stigma levels based on education ($p_{prejudice}$ = .001; $p_{tolerance}$ = .007) and occupation ($p_{prejudice}$ = .025), higher stigma being associated with lower education levels and specific healthcare occupations (medical assistant). Additionally, a positive correlation was found between age and stigma perception (r = -236, $p_{prejudice}$ = .002; r = -167, $p_{tolerance}$ = .033).
Conclusions: The findings underscore the urgent necessity for targeted anti-stigma interventions within Portuguese integrated continuing care units, focusing on mitigating education-based disparities, and addressing specific healthcare occupations that exhibit heightened stigma. Effectively combating stigma among professionals is crucial for fostering a more inclusive and compassionate environment in these care settings.

Keywords: mental illness, stigma, health services, professionals, Integrated Continuing Care Units

Introduction

People will often stigmatize those with mental disorders, discriminating against them, and denying them essential rights and care. In addition, such is followed by social isolation, negatively influencing and limiting education and employment (Corrigan et al., 2000; WHO, 2022). Thus, the stigma associated with mental illness (MI) stands as a major barrier to access treatment and can bear a significant impact on the potential for recovery (Knaak et al., 2017). The concept of stigma was proposed by Erving Goffman in 1961 as a complex social process of labeling, devaluation, and discrimination involving an interconnection of cognitive, emotional, and behavioral components (Goffman, 1963; Knaak et al., 2017; Lyon & Mortimer-Jones, 2020; Moreira et al., 2021). According to

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Corrigan & Penn (1999), stigma can have even more of an impact on a person's life than the symptoms of MI itself, and can operate at an individual, interpersonal, and social level (Gagné et al., 2023). Therefore, Corrigan and Bink (as cited in Kolb et al., 2023) differentiate "public stigma" from "self-stigma", noting that stereotypes about mental illnesses generate discriminatory behaviors in individuals without an illness, while in a person with mental illness, experiences of prejudice and discrimination are internalized.

In healthcare settings, stigmatizing attitudes, the use of stereotypes and the attribution of characteristics to the patient before assessing their state of health can have an impact, particularly on the professional's involvement in responding to the health episode or condition, poor prognosis, longer waiting times and verbal abuse (Ghuloum et al., 2022; Gras et al., 2015; Lien et al., 2019). In this way, compromising the adequacy of care can contribute to the worsening of the individual's condition. Thus, the stigma related to mental illness in healthcare systems is identified as a barrier to treatment and recovery, as well as poorer quality care for individuals suffering from mental illnesses (Del Olmo-Romero et al., 2019; Lien et al., 2019; Rivera-Segarra et al., 2019). In addition, in many healthcare settings, stigmatization can cause more harm than the disease itself, and can significantly contribute to a decrease in the healthcare service users' quality of life (Carrara et al., 2019).

Research shows that health professionals are just as likely to have stigmatizing beliefs and behaviors towards people with MI as the general population – since they share stigmatizing attitudes, regarding people with MI as incompetent, violent, and dangerous (Rivera-Segarra et al., 2019). In addition, qualitative studies show that users of general and mental health services complain about stigmatizing and discriminatory attitudes on the part of professionals (Del Olmo-Romero et al., 2019). It is therefore important for healthcare professionals to be aware of the adverse effect that stigmatizing attitudes and discriminatory behavior can produce on healthcare consumers (Carrara et al., 2021).

Schizophrenia and depression are the most common mental disorders to be stigmatized (Jauch et al., 2023; Rivera-Segarra et al., 2019). It should be noted: recent studies have found that professionals stigmatize people with schizophrenia more than those with depression. In addition, they often perceive people with personality disorders as manipulative and thus less deserving of care, and demonstrate a similar attitude towards people with suicidal ideation and substance abuse (Rivera-Segarra et al., 2019).

According to the study by Rivera-Segarra et al. (2019), the attitudes and beliefs health professionals carry can generate a direct influence on their interventions. One example from the same study reveals that the narratives given by professionals show they actively ignore mental illness patients' complaints and only refer them to a mental health professional, even though their main complaint is physical (Rivera-Segarra et al., 2019).

MI related stigma in health services is an area that has been analyzed and identified as a cause for concern. Therefore, a strong impetus exists to carry out research into this issue (Jauch et al., 2023). Interventions through anti-stigma education have been carried out all over the world as a way of combating this problem (Ghuloum et al., 2022; Lien et al., 2019; Raj, 2022). In Portugal, a recent study showed that healthcare professionals exhibit better attitudes and behaviors towards people with MI compared to other professionals in the education and social fields, and that these results are justified due to a greater training and daily contact with people having MI in their jobs (Simões de Almeida et al., 2023). However, there is no evidence available in Portugal in other specific settings, such as Integrative Continuing Care Units (ICCUs).

ICCUs in Portugal are a set of services that aim to provide a response to people in dependency situations and in need of specialized care. They were created in 2005 by Decree-Law no. 101/2006, of 6th June, and became the Portuguese National Network for Integrated Continuing Care (NNICC) (Armindo & Dourado, 2022; Monteiro et al., 2013). Their objectives are to provide health care and social support in a continuous and integrated manner to people who, regardless of age, live in a dependency situation as a result of illness or in need to prevent the worsening of a chronic illness (Armindo & Dourado, 2022; Monteiro et al., 2013; Unidade de Gestão e Acompanhamento da Rede Nacional de Cuidados Continuados Integrados, 2022). The NNICC is made up more specifically of areas such as medicine, nursing, physiotherapy, occupational therapy, speech therapy, psychology, and social work. In Portugal, as of March 2023, there are a total of 672 institutions (Serviço Nacional de Saúde, 2023; Unidade de Gestão e Acompanhamento da Rede Nacional de Cuidados Continuados Integrados, 2022).

Since no research has ever been published in Portugal evaluating stigma and discrimination among NNICC professionals, the aim of this present study is to describe the levels of stigma and discrimination towards people with MI among professionals working in general ICCUs.

Methods

A quantitative, cross-sectional study was conducted from May to July 2023 using an online questionnaire available to the participants in the Google® Forms platform. Participants needed to meet the following criteria for inclusion in the study: to work in ICCUs and to be able to read and understand Portuguese.

Participants and Data Collection

The sample numbered 163 participants, with a mean age of 34.36 (*SD* = 8.80) years, 146 (89.6%) females, 83 (50.9%) married or in a de facto relationship, and 94 (57.7%) living in the North of Portugal. Most of the participants were therapists – physical, occupational, speech and language therapists (*n* = 58; 35.6%) or medical doctors and nurses (*n* = 49; 30.1%), had a bachelor's degree (*n* = 105; 64.4%), and working in ICCUs for less than five years previously (*n* = 88; 54.0%) (Table 1).

No official information is available regarding the total number of professionals working in the general ICCUs; therefore, the authors do not know to what degree the sample represents the population.

Table 1. Sociodemographic Characterization of the Sample

	Variables	*n* (%)
Gender	Male	17 (10.4)
	Female	146 (89.6)
Occupation	Medical doctor/nurse	49 (30.1)
	Therapist (OT, PT, SLT)	58 (35.6)
	Others social and healthcare professionals	31 (19.0)
	Medical assistant	25 (15.3)
Education	High School	27 (16.6)
	Bachelor's degree	105 (64.4)
	Master's degree	31 (19.0)
Marital status	Single/ Divorced/ Widowed	80 (49.1)
	Married/De facto relationship	83 (50.9)
Country regions	North	94 (57.7)
	Center	44 (27.0)
	South	25 (15.3)
Working in ICCUs (years)	0 – 5	88 (54.0)
	5 – 10	40 (24.5)
	> 10	35 (21.5)
Variable		
Age (years)		34.36 (SD = 8.80)

Notes. M – Mean; SD – Standard Deviation; OT – Occupational Therapist; PT – Physical Therapist; SLP – Speech and Language Therapist; ICCU - Integrative Continuing Care Unit.

The sampling method consisted of a non-probabilistic snowball sampling (Marôco, 2018).

Data was then collected via sharing an online questionnaire with professionals from various ICCUs – e-mails were sent to the units. In order to take part in the study, participants had to complete a declaration of informed consent, in accordance with the Declaration of Helsinki (WMA, 2001). Ethical approval was sought from the ESS, Polytechnic University of Porto Ethics Committee (CE0049D).

Measures

To carry out this study, a sociodemographic questionnaire and two assessment instruments were used: the Attribution Questionnaire (AQ-27) and the Community Attitudes Toward Mental Illness (CAMI).

In order to characterize the sample, the research team developed a sociodemographic questionnaire that consisted of questions such as age, gender, marital status, educational level, occupation, and length of time working in an ICCU.

The Attribution Questionnaire (AQ-27)

The Attribution Questionnaire (AQ-27) is an assessment tool that involves nine dimensions of stigma: Blame, Pity, Irritation, Dangerousness, Fear, Help, Coercion, Segregation, and Avoidance (Sousa et al., 2008). The AQ-27 is made up of different items with variations in the characteristics of the MI being assessed, especially the condition's severity. The AQ-27 comprises a report of an individual with schizophrenia, followed by 27 statements that must be scored using a 9-point Likert-type scale, where 1 means "not at all" and 9 means "very much". The results are calculated using the average scores obtained for the items that make up each dimension. The Avoidance questions are scored inversely. Higher scores correspond to greater stigma towards people with MI and each of the dimensions of the AQ-27 varies between 3 and 27 points (Pinto et al., 2020; Sousa et al., 2012). The preliminary version of the AQ-27 in Portuguese has a Cronbach's α of .88, close to that reported in other studies carried out in Portugal, namely .76 and .83 (Ferrari et al., 2020; Sousa et al., 2012). In this study, AQ-27 has a Cronbach's α = .82 (subscales Cronbach's α: Coercion - .33; Segregation - .76; Avoidance - .69; Fear - .87; Dangerousness - .83; Help - .76; Pity - .68; Anger - .63; Blame - .54).

The Community Attitudes towards Mental Illness (CAMI)

The Community Attitudes towards Mental Illness (CAMI) is an instrument validated for the Portuguese population and developed by Taylor & Dear in 1981 to assess the general public's attitudes towards people with MI (Lopes, 2020; Taylor & Dear, 1981). Initially, this questionnaire consisted of 40 questions, but later adjustments were made to employ a scale with 27 questions and a shorter one with 12 questions. This study used the 27-question scale, which has been validated for the Portuguese population. The scale is divided into two factors, specifically prejudice and exclusion, corresponding to questions 1–3, 11–18, 25 and 26, as well as tolerance and support in the community, corresponding to questions 4–10, 19–24, and 27. The classification is made according to a Likert-type scale from 1 "strongly agree" to 5 "strongly disagree" in questions 1–3, 11–18, 25 and 26, while in questions 4–10, 19–24, and 27 it is made inversely, with 5 being "strongly agree" and 1 being "strongly disagree". The higher the score, the less stigmatizing the attitudes. Cronbach's α for prejudice and social exclusion was .70 and for tolerance and support in the community, .63 (Lopes, 2020). This study has a Cronbach's α of .71 for prejudice and exclusion and .67 for tolerance and support.

Statistical Analysis

After collecting the data, a statistical analysis was carried out using the Statistical Package for the Social Science (SPSS) 28.0 for Windows software with a significance level of .05 and a 95% confidence interval for all the statistical tests applied (Marôco, 2018; Pestana Maria, 2014). The sample's characteristics were analyzed using descriptive statistics. Normality was checked for all variables using skewness (between -0.05 and 1.79) and kurtosis (between 0.12 and 5.16), aiming for values of skewness less than |2.0| and kurtosis less than |9.0| (Gignac, 2019; Cain et al., 2017). Comparisons between the assessment instruments (total score and subscales) and the variables were made using independent Student's t-tests and one-way ANOVA. Pearson's and Spearman's correlation coefficients were used to assess the association between the instrument values and age and years of experience in ICCUs (Marôco, 2018). Multiple Linear Regressions models using a stepwise method were implemented to predict the value of dependent variables (total CAMI, subscales prejudice and tolerance, and total AQ) starting from the knowledge of several independent variables (age, education and occupation). Using stepwise methods for variable selection in multiple regression can save time and effort, particularly with many potential predictors. Categorical variables (education and occupation) were added to the model as ordinal variables. The assumptions for the analysis (linear relationship between the independent and dependent variables, using scatter plot; absence of multicollinearity, using values of tolerance Variance Inflation Factor (VIF); independence of the residuals, using Durbin-Watson's test; constant variance, using a graph of "standardized residuals" against the "standardized

predicted value" – and normal distribution of residuals — using a quantile-quantile (Q-Q) plot; and presence of outliers, using Cook's distance values less than 1) were tested and verified (Marôco, 2018).

Results

Table 2 shows the values of perceived stigma, measured by CAMI - 115.60 (*SD* = 9.82) and AQ - 100.93 (*SD* = 20.78) for the total sample. Analyzing these values according to sociodemographic variables, also in Table 2, it is visible that, statistically significant differences exist between occupation [CAMI: $F(3) = 3.83$, $p = .011$; AQ: $F(3) = 3.58$, $p = .015$] and educational level [CAMI: $F(2) = 8.14$, $p < .001$; AQ: $F(2) = 3.62$, $p = .029$], in both instruments. Post-hoc tests (Bonferroni) show differences in total CAMI between those with high school education [109.41 (9.42)] and those with bachelor's [(116.17 (9.69); $p = .003$] and master's degrees [119.06 (8.34); $p < .001$], as well as between medical doctors and nurses [116.51 (9.39)], and medical assistants [109.68 (9.38); $p = .025$], and lastly with therapists [117.05 (10.16)]; $p = .009$]. In the total AQ, there were differences between those possessing high school education [109.78 (27.11)] and those having master's degree [95.65 (19.41); $p = .029$], and between therapists [98.10 (19.68)] and medical assistants [112.56 (26.99); $p = .020$], and lastly with other professionals ($p = .024$). A negative association between the age of participants and CAMI was also present (Spearman's Rho = -.22; $p = .004$), with the older participants showing more stigma.

Table 2. Stigma Measures According to Sociodemographic Variables and Total Sample

Variables	CAMI total			AQ total		
	M *(SD)*	*p*	Effect size	M *(SD)*	*p*	Effect size
Total sample	115.60 *(9.82)*			100.93 *(20.78)*		
Gender [a]						
Male	112.88 *(9.84)*	.229	-.31	102.65 *(29.26)*	.796	.09
Female	115.92 *(9.80)*			100.73 *(19.69)*		
Occupation [b]						
Medical doctor/nurse	116.51 *(9.39)*	.011	.07	101.08 *(18.09)*	.015	.06
Therapist (OT, PT, SLT)	117.05 *(10.16)*			98.10 *(19.68)*		
Others social and healthcare professionals	116.23 *(8.82)*			96.61 *(18.51)*		
Medical assistant	109.68 *(9.38)*			112.56 *(26.99)*		
Education [b]						
High School	109.41 *(9.42)*	< .001	.09	109.78 *(27.11)*	.029	.04
Bachelor's degree	116.17 *(9.69)*			100.22 *(18.74)*		
Master's degree	119.06 *(8.34)*			95.65 *(19.41)*		
Marital status [a]						
Single/ Divorced/ Widower	115.79 *(10.10)*	.813	.04	102.96 *(23.02)*	.222	.19
Married/De facto relationship	115.42 *(9.59)*			98.98 *(18.30)*		
Country regions [b]						
North	115.68 *(10.04)*	.961	.00	101.22 *(20.19)*	.230	70 (.70)
Center	115.89 *(9.96)*			103.75 *(22.16)*		
South	115.20 *(9.02)*			94.88 *(20.05)*		
Working in ICCUs (years) [b]						
0–5	116.85 *(9.35)*	.054	.04	100.56 *(20.71)*	.918	<.01
5–10	115.88 *(8.06)*			100.63 *(18.63)*		
>10	112.14 *(12.02)*			102.23 *(23.68)*		
	Rho [c]	*p*		Rho [c]	*p*	
Age (years)	-.22	.004		.04	.597	

Notes. M – Mean; *SD* – Standard Deviation; OT – Occupational Therapist; PT – Physical Therapist; SLP – Speech and Language Therapist; ICCU - Integrative Continuing Care Unit. Effect size - eta-squared, Cohen's d; [a] – Independent samples t-test with Cohen's d as effect size. [b] – One-Way ANOVA with eta-squared as effect size; [c] – Spearman's correlation

Tables 3 and 4 demonstrate the values of CAMI and AQ subscales according to education and occupation. Both CAMI subscales (Table 3) show statistically significant differences among the participants' various levels of education, with bachelor's and master's degree holders having a lower level of stigma than those with high school education [$F(2)_{prejudice} = 7.07$, $p = .001$; $F(2)_{tolerance} = 5.10$, $p = .025$]. Post-hoc tests show differences in the subscale "Prejudice" between those possessing high school education [54.67 (6.46)] and those having earned bachelor's [58.24 (5.21); $p = .005$] and master's degrees [59.60 (3.87); $p = .001$].

Regarding occupation, differences occurred between occupations [$F(3)_{prejudice} = 3.21$, $p = .025$]. Post-hoc tests show differences between medical doctors/ nurses [58.56 (4.46)] and medical assistants [54.88 (6.60); $p = .034$] and, also, between the latter and therapists [58.43 (5.64); $p = .035$].

In the subscale "Tolerance", there were differences between high school education [54.74 (4.72)] and bachelor's [57.93 (5.97); $p = .033$] and master's degrees [59.45 (5.80); $p = .007$] (post-hoc data not shown but available upon request).

The association between age and CAMI subscales indicates that stigma increases with age: the older the participant, the higher his/her perception of stigma (Spearman's Rho prejudice = -.24 and $p_{prejudice} = .002$; Spearman's Rho tolerance = -.17 and $p_{tolerance} = .033$).

Table 3. CAMI Subscales Measures According to Occupation and Education

Variables	CAMI subscales					
	Prejudice			Tolerance		
	M *(SD)*	*p*	Effect size	M *(SD)*	*p*	Effect size
Occupation [a] Medical doctors & nurses Therapist (OT, PT, SLT) Others social/healthcare professional Medical assistant	58.56 (4.46) 58.43 (5.64) 58.39 (4.70) 54.88 (6.60)	.025	.06	57.98 *(6.12)* 58.62 *(6.36)* 57.84 *(5.16)* 54.80 *(4.34)*	.054	.05
Education [a] High School Bachelor's degree Master's degree	54.67 *(6.46)* 58.24 *(5.21)* 59.60 *(3.87)*	.001	.08	54.74 *(4.72)* 57.93 *(5.97)* 59.45 *(5.80)*	.007	.06
	Rho [b]	*p*		Rho [c]	*p*	
Age (years)	-.24	.002		-.17	.033	

Notes. M – Mean; *SD* – Standard Deviation; r – Spearman's correlation; OT – Occupational Therapist; PT – Physical Therapist; SLP – Speech and Language Therapist; [a] – One-Way ANOVA with eta-squared as effect size; [b] – Spearman's correlation

The subscales of AQ (Table 4), in most part, did not exhibit significant differences, either in levels of education or in types of occupation, except for the subscales "Coercion" and "Segregation". Regarding education levels, the subscale "Segregation" shows lower levels of segregation by the participants with bachelor and master levels in relation to people with mental conditions [$F(2)_{segregation} = 131.89$, $p < .001$]. In the comparisons between types of occupation, both the subscales "Coercion" and "Segregation" show lower stigma in therapists and other health and social professionals [$F(3)_{coercion} = 44.53$, $p = .042$; $F(3)_{segregation} = 108.04$, $p < .001$]. Post-hoc tests indicate differences, in the subscale "Segregation" between those with high school education and those with bachelor's ($p = .008$) and master's degrees ($p = .001$), as well as between medical doctors, nurses and medical assistants ($p = .001$), medical assistants and therapists ($p < .001$), and between other health and social professionals and medical assistants ($p = .003$). In the subscale "Coercion", differences emerged between other health and social professionals and medical assistants ($p = .035$) (post-hoc data not shown but available by request).

The association between age and AQ subscales also demonstrates that stigma increases with age, but only in the subscale "Blame": the older the participant, the higher his/her perception that people with mental problems were to blame for their condition (Spearman's Rho = .19 and $p = .010$).

Table 4. AQ Subscales Measures According to Occupation and Education

	AQ1		AQ2		AQ3		AQ4		AQ5		AQ6		AQ7		AQ8		AQ9	
	M(*SD*)	p	M(*SD*)	p	M(*SD*)	p	M(*SD*)	p	M(*SD*)	p	M(*SD*)	p	M(*SD*)	p	M(*SD*)	p	M(*SD*)	p
Occupation [a]																		
Medical doctor & nurse	7.26 (*2.93*)		16.39 (*3.06*)		6.59 (*3.06*)		7.53 (*3.12*)		6.67 (*3.00*)		23.90 (*3.04*)		14.78 (*3.98*)		6.67 (*4.16*)		11.29 (*5.25*)	
Therapist (OT, PT, SLT)	7.76 (*4.60*)	.630	15.05 (*5.46*)	.304	6.22 (*3.18*)	.333	7.05 (*3.79*)	.287	6.80 (*3.65*)	.149	23.31 (*3.69*)	.114	14.57 (*4.24*)	.042	6.57 (*3.39*)	<.001	10.76 (*4.71*)	.348
Others social/healthcare professional	7.16 (*2.78*)		14.87 (*5.60*)		6.10 (*3.33*)		7.10 (*3.43*)		6.61 (*3.40*)		24.23 (*3.60*)		13.81 (*3.27*)		6.58 (*3.45*)		10.16 (*5.18*)	
Medical assistant	8.28 (*4.18*)		16.96 (*5.73*)		7.72 (*5.80*)		8.88 (*6.62*)		8.76 (*6.77*)		22.00 (*4.82*)		16.80 (*4.20*)		10.21 (*6.17*)		12.64 (*6.95*)	
Education [a]																		
High School	8.15 (*4.01*)		17.04 (*5.49*)		7.19 (*5.74*)		8.26 (*6.50*)		8.19 (*6.69*)		22.33 (*4.72*)		16.44 (*4.25*)		9.78 (*6.25*)		12.41 (*6.92*)	
Bachelor's degree	7.46 (*3.91*)	.695	15.66 (*5.23*)	.276	6.52 (*3.26*)	.498	7.63 (*3.48*)	.170	6.92 (*3.38*)	.219	23.51 (*3.62*)	.141	14.44 (*3.88*)	.071	7.03 (*3.80*)	< .001	11.05 (*4.84*)	.260
Master's degree	7.52 (*3.05*)		14.74 (*6.10*)		6.03 (*2.79*)		6.32 (*3.32*)		6.35 (*3.29*)		24.26 (*2.90*)		14.74 (*4.26*)		5.58 (*3.17*)		10.10 (*5.43*)	
Age (years)[b]	Rho	p	Rho	p	Rho	p	Rho	p	Rho	p	Rho	p	Rho	p	Rho	p	Rho	p
	.189	.015	-.099	.209	-.055	.490	-.075	.344	-.115	.145	-.007	.927	.153	.051	.098	.214	.055	.485

Notes. M – Mean; *SD* – Standard Deviation; Rho – Pearson's correlation; OT – Occupational Therapist; PT – Physical Therapist; SLP – Speech and Language Therapist. [a] - One Way ANOVA. [b] – Spearman's correlation

Multivariate linear regression (Table 5) revealed statistically significant models for the total CAMI [$F(2,160) = 10.43$; $p < .001$; $R^2 = .10$] and for both the prejudice sub-scale [$F(3,159) = 6.44$; $p < .001$; $R^2 = .11$] and the tolerance sub-scale [$F(2,160) = 9.61$; $p < .001$; $R^2 = .07$] of CAMI. Education level ($B = .20$; $t = 3.36$; $p < .001$) and age ($B = 4.18$; $t = -2.40$; $p = .017$) were found to be predictors of stigma in the total CAMI, as were education level ($B = 1.93$; $t = 2.47$; $p = .015$) and age ($B = -.12$; $t = -2.43$; $p = .016$) predictors of the existence of prejudice, and age ($B = -.09$; $t = -2.52$; $p = .013$) and education level ($B = 2.08$; $t = 3.04$; $p = .003$) predictors of tolerance. In the multivariate regression [$F(1,161) = 6.71$; $p = .010$; $R^2 = .03$], stigma as measured by AQ-27 was shown to be predicted only by education level ($B = -6.96$; $t = -2.59$; $p = .010$). This model explains a very low variance.

Table 5. Multiple Regression Models to Analyze CAMI Total and Subscales and ASQ With Sociodemographic Variables

	total CAMI	tolerance subscale CAMI	prejudice subscale CAMI	total AQ
Constant	114.12 (4.25)	56.39 (2.61)	58.38 (2.81)	115.01 (5.67)
Education level	-0.20** (0.08)	2.08** (0.77)	1.93* (0.79)	-6.96 ** (2.68)
Age	4.18 * (1.24)	-0.09* (0.05)	-0.12* (0.05)	
Occupation			-0.20 (0.46)	
R-squared	.10	.07	.11	.03

Notes. Standard errors are reported in parentheses.
*, ** indicate significance at the 95%, and 99% level, respectively.

Discussion

This study aims to analyze stigma and discrimination towards people with MI by professionals working in general ICCUs. Our sample shows low levels of stigma and discrimination against people with MI, in comparison with the medium values of the scales used. This could be a positive factor in raising awareness and the acceptance of MI and, consequently, promoting a greater recovery for people with MI (Avdibegović & Hasanović, 2017; Pinto et al., 2020).

Concerning occupation, medical assistants stand out, showing greater stigma towards people having MI. When a person suffering from MI is approached in healthcare, the knowledge that the person has a diagnosis of MI could increase the desire for social distancing, as well as the discomfort in assessing and treating the person in a medical emergency context (Henderson et al., 2014). In addition, people with MI tend to be particularly rejected and are often considered difficult, manipulative, and less deserving of care (Knaak et al., 2017; Minas et al., 2011). Professionals reveal negative attitudes when caring for people with MI, displaying attitudes of futility and reporting that it is difficult to build a relationship with people having MI (Tyerman et al., 2020). The lower stigma observed among therapists, nurses and medical doctors, and other social/ healthcare professionals compared to medical assistants may be attributed to differences in education, training, and professional exposure. Those in higher education professions often undergo extensive education and training in mental health, which may contribute to increased knowledge, empathy, and reduced stigma. In contrast, medical assistants may have less specialized training in mental health and fewer years of education, leading to a comparatively higher level of stigma (Aflakseir et al., 2019; Marangu et al., 2021).

Literacy and education levels play pivotal roles in shaping individuals' attitudes and perceptions, particularly concerning sensitive topics such as mental health stigma. Higher literacy and education levels are often associated with increased awareness, open-mindedness, and a more nuanced understanding of mental health issues. Individuals with higher educational attainment are likely to have been exposed to diverse perspectives, mental health education, and anti-stigma campaigns, thus fostering a more empathetic and informed outlook. On the contrary, lower literacy levels and limited access to education can contribute to misconceptions, stereotyping, and heightened stigma surrounding mental health conditions. Efforts to combat stigma should thus prioritize educa-

tional initiatives, aiming to enhance literacy and promote awareness to create a more inclusive and understanding society (De Silva et al., 2020; Sweileh, 2021).

As for the association between age and increased stigma perception, several factors could contribute. Older individuals may have been exposed to historical societal attitudes that stigmatize mental health conditions, leading to ingrained beliefs. Additionally, older individuals may have had limited exposure to contemporary mental health education and awareness initiatives, potentially influencing their perceptions. Socialization and cultural influences over time may also contribute to generational differences in stigma levels as well as older people having more beliefs and more inflexibility. It is important to note that these are potential explanations, and the complex interplay of various factors influencing stigma requires further investigation (Farrer et al., 2008; Chesser et al., 2016). In fact, while the variables education level, age, and occupation are significant in our study, they only explain 10% of the stigma, which leads to the need for a broader understanding of this phenomenon and further research. The effects of stigma on people with mental illness are known to differ depending on social and demographic categories; a recent narrative review (Ahad et al., 2023) highlights the significance of cultural nuances in contributing to stigma and emphasizes the need to develop cultural sensitivity to combat stigma and raise the awareness of mental health issues worldwide.

Moreover, although this study revealed low levels of stigma and discrimination, its presence is inevitable. It is known that researchers identify lack of awareness as the main factor for the presence of stigma in MI in some social groups. At the same time, interpersonal factors such as social skills, physical appearance, positive and negative symptoms of mental illness, personal experiences, peer relationships and the image that the media displays of people with MI also contribute to the presence of stigma (Ansari et al., 2008; Edwards & Kotera, 2021). A study of medical students in Portugal suggests that theoretical training and contact with people suffering from MI constitute factors that contribute to changes in attitudes and stigma. Students who had already studied or interned in psychiatric wards showed fewer attitudes and greater willingness to include people with MI in the community (Pinto et al., 2020). Thus, practices such as social contact, including testimonies from people with lived experience of MI and educational approaches are fundamental strategies for reducing stigma in healthcare (Carrara et al., 2019; Knaak et al., 2017).

Strengths and Limitations

Possible limitations of this study include a restricted and non-representative sample, as participants were solely recruited online, raising concerns about the generalizability of findings to broader populations or different contexts. The potential for selection bias cannot be ignored, given that participants were volunteers, introducing the possibility that they may differ in characteristics from the general population of healthcare professionals working in ICCUs. Additionally, there is a risk of social desirability bias in responses, particularly when addressing sensitive issues such as attitudes towards patients with mental illnesses. Self-reported data collection introduces social desirability and subjectivity, affecting the reliability of these results. Careful consideration of these limitations remains crucial for interpreting and applying the study's results accurately.

In this sample, differences were found in the perception of stigma according to education levels and occupations. These differences were more visible with the CAMI scale than with the AQ-27, which may be due to the specificities of each one – the CAMI scale divides stigma into two constructs (prejudice and tolerance) while the AQ-27 divides it into nine dimensions, which represent different discriminatory attitudes. We can hypothesize that these attitudes do not contribute the same weight to the stigma construct, and this may be the reason why not only the total values are lower, but also why some of its subscales do not present significant results when analyzed in the present sample.

On the other side, strengths of this study lie prominently in its pioneering nature as the first investigation targeting this specific population – professionals working in ICCUs. Through encompassing diverse professional roles, the research is positioned to uncover nuanced insights into the similarities and differences in attitudes across various healthcare domains. Furthermore, the study's nature promotes a comparative analysis of attitudes among different healthcare professionals, enabling the identification of profession-specific factors that may influence perceptions. This multi-professional assessment not only contributes to the current understanding of mental health attitudes but also serves as a catalyst for future research endeavors seeking to address mental health challenges across a spectrum of healthcare occupations.

Conclusions, Implications and Future Directions

This study aims to describe the levels of stigma and discrimination against people with mental illness (MI) among professionals working in general Integrated Continuing Care Units (ICCUs).

The study reveals that the level of stigma towards individuals with MI among professionals in general ICCUs is low. This may be attributed to a greater willingness to accept MI and an increase in initiatives supporting mental health following the COVID-19 pandemic. Another contributing factor involves the indirect contact these professionals have with the MI population in their professional context. Results indicate that stigma levels vary according to occupation and education, with higher levels of stigma associated with certain healthcare fields (e.g., medical assistants) and lower educational levels. Additionally, a positive correlation was found between age and stigmatizing attitudes, suggesting that stigma increases with age. Cultural and contextual value systems, which differ over time and between contexts, also influence stigma (Subu et al., 2021). Specifically, more stigmatizing attitudes were observed among medical assistants, likely due to insufficient education or training on mental health issues. This lack of understanding can contribute to stereotypes and misconceptions about mental illness.

In summary, stigma levels varied significantly based on education and occupation, with higher levels of stigma observed among those having lower education levels and in certain healthcare professions. This highlights the need for targeted anti-stigma interventions within Portuguese ICCUs to address these disparities and promote a more inclusive environment. Emphasizing the importance of mental health literacy initiatives, such as psychoeducation, can increase the involvement and integration of individuals with MI in the community, leading to better approaches by healthcare professionals in the ICCUs.

Therefore, more awareness-raising activities should be incorporated into the training curriculum for these professionals. Creating initiatives such as educational or literacy programs focused on mental health appreciation, alongside promoting direct contact with individuals having MI, is crucial to reducing stigma and discrimination. These initiatives allow professionals to gain a better understanding of MI symptoms and consequently improve their approach to individuals with MI in the ICCUs. Reducing stigma towards people with MI brings significant benefits, thus contributing to their successful recovery.

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The authors have no conflicts of interest to disclose.

Ethical statement
This manuscript is the authors' original work.
All participants engaged in the research voluntarily and anonymously.
Their data are stored in coded materials and databases without personal data.
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Data Availability Statement

Datasets presented in this article are available from the corresponding author upon reasonable request.

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References

Aflakseir, A., Esini, M. R., Goodarzi, M., & Molazadeh, J. (2019). Individuals with mental illness and stigma reduction: A cross-sectional study in a group of college students. *Iranian Journal of Psychiatry, 14*(4), 297–301. https://doi.org/10.18502/ijps.v14i4.1980

Ahad, A. A., Sanchez-Gonzalez, M., & Junquera, P. (2023). Understanding and addressing mental health stigma across cultures for improving psychiatric care: A narrative review. *Cureus, 15*(5), Article e39549. https://doi.org/10.7759/cureus.39549

Ansari, M. A., Raza-Ur-Rahman, Siddiqui, A. A., Jabeen, R., Qureshi, N. R., & Sheikh, A. A. (2008). Socio-demographic correlates of stigma attached to mental illness. *Journal of the Liaquat University of Medical and Health Sciences, 7*(3), 199–203. https://doi.org/10.22442/JLUMHS.08730176

Armindo, R. M., & Dourado, M. (2022). Sinais e sintomas em Unidades de Cuidados Continuados Integrados: Um estudo em duas unidades de média duração e reabilitação [Signs and symptoms in Integrated Continuing Care Units: A study in two medium-term and rehablititation units]. *Revista Portuguesa de Medicina Geral e Familiar, 38*(2), 158–170. https://doi.org/10.32385/RPMGF.V38I2.13235

Avdibegović, E., & Hasanović, M. (2017). The stigma of mental ilness and recovery. *Psychiatria Danubina, 29*(Supplement 5), 900–905.

Cain, M. K., Zhang, Z., & Yuan, K.-H. (2017). Univariate and multivariate skewness and kurtosis for measuring nonnormality: Prevalence, influence and estimation. *Behavior Research Methods, 49,* 1716–1735. https://doi.org/10.3758/S13428-016-0814-1

Carrara, B. S., Fernandes, R. H. H., Bobbili, S. J., & Ventura, C. A. A. (2021). Health care providers and people with mental illness: An integrative review on anti-stigma interventions. *The International Journal of Social Psychiatry, 67*(7), 840–853. https://doi.org/10.1177/0020764020985891

Carrara, B. S., Ventura, C. A. A., Bobbili, S. J., Jacobina, O. M. P., Khenti, A., & Mendes, I. A. C. (2019). Stigma in health professionals towards people with mental illness: An integrative review. *Archives of Psychiatric Nursing, 33*(4), 311–318. https://doi.org/10.1016/J.APNU.2019.01.006

Chesser, A. K., Keene Woods, N., Smothers, K., & Rogers, N. (2016). Health literacy and older adults: A systematic review. *Gerontology and Geriatric Medicine, 16*(2), Article 2333721416630492. https://doi.org/10.1177/2333721416630492

Corrigan, P. W., & Penn, D. L. (1999). Lessons from social psychology on discrediting psychiatric stigma. *American Psychologist, 54*(9), 765–776. https://doi.org/10.1037/0003-066X.54.9.765

Corrigan, P. W., River, L. P., Lundin, R. K., Uphoff Wasowski, K., Campion, J., Mathisen, J., Goldstein, H., Bergman, M., Gagnon, C., & Kubiak, M. A. (2000). Stigmatizing attributions about mental illness. *Journal of Community Psychology, 28*(1), 91–102. https://doi.org/10.1002/(SICI)1520-6629(200001)28:1<91::AID-JCOP9>3.0.CO;2-M

Del Olmo-Romero, F., González-Blanco, M., Sarró, S., Grácio, J., Martín-Carrasco, M., Martinez-Cabezón, A. C., Perna, G., Pomarol-Clotet, E., Varandas, P., Ballesteros-Rodríguez, J., Rebolleda-Gil, C., Vanni, G., González-Fraile, E., & The INTER NOS group (2019). Mental health professionals' attitudes towards mental illness: Professional and cultural factors in the INTER NOS study. *European Archives of Psychiatry and Clinical Neuroscience, 269*, 325–339. https://doi.org/10.1007/S00406-018-0867-5

De Silva, L. E. D., Ponting, C., Ramos, G., Guevara, M. V. C., & Chavira, D. A. (2020). Urban Latinx parents' attitudes towards mental health: Mental health literacy and service use. *Children and Youth Services Review, 109*, Article 104719.

Edwards, A. M., & Kotera, Y. (2021). Mental health in the UK police force: A qualitative investigation into the stigma with mental illness. *International Journal of Mental Health and Addiction, 19*, 1116–1134. https://doi.org/10.1007/s11469-019-00214-x

Farrer, L., Leach, L., Griffiths, K. M., Christensen, H., & Jorm, A. F. (2008). Age differences in mental health literacy. *BMC Public Health,* 8, Article 125. https://doi.org/10.1186/1471-2458-8-125

Ferrari, S., Bressi, C., Busnelli, E., Mattei, G., Pozzoli, S., Oliva, A., Galeazzi, G. M., & Pingani, L. (2020). Stigma on mental health among high school students: Validation of the Italian

version of the Attribution Questionnaire-27 (AQ-27-I) in a high school student population. *International Journal of Environmental Research and Public Health, 17*(14), Article 5207. https://doi.org/10.3390/IJERPH17145207

Gagné, T., Henderson, C., & McMunn, A. (2023). Is the self-reporting of mental health problems sensitive to public stigma towards mental illness? A comparison of time trends across English regions (2009–19). *Social Psychiatry and Psychiatric Epidemiology, 58*, 671–680. https://doi.org/10.1007/s00127-022-02388-7

Ghuloum, S., Mahfoud, Z. R., Al-Amin, H., Marji, T., & Kehyayan, V. (2022). Healthcare professionals' attitudes toward patients with mental illness: A cross-sectional study in Qatar. *Frontiers in Psychiatry, 13*, Article 884947. https://doi.org/10.3389/FPSYT.2022.884947

Gignac, G. E. (2019). *How2statsbook* (Online Edition 1). http://www.how2statsbook.com/

Goffman, E. (1963). *Stigma: Notes on the Management of spoiled identity*. Pelican Books.

Gras, L. M., Swart, M., Slooff, C. J., van Weeghel, J., Knegtering, H., & Castelein, S. (2015). Differential stigmatizing attitudes of healthcare professionals towards psychiatry and patients with mental health problems: Something to worry about? A pilot study. *Social Psychiatry and Psychiatric Epidemiology, 50*, 299–306. https://doi.org/10.1007/S00127-014-0931-Z

Henderson, C., Noblett, J., Parke, H., Clement, S., Caffrey, A., Gale-Grant, O., Schulze, B., Druss, B., & Thornicroft, G. (2014). Mental health-related stigma in health care and mental health-care settings. *The Lancet. Psychiatry, 1*(6), 467–482. https://doi.org/10.1016/S2215-0366(14)00023-6

Jauch, M., Occhipinti, S., & O'Donovan, A. (2023). The stigmatization of mental illness by mental health professionals: Scoping review and bibliometric analysis. *PLOS ONE, 18*(1), Article e0280739. https://doi.org/10.1371/JOURNAL.PONE.0280739

Knaak, S., Mantler, E., & Szeto, A. (2017). Mental illness-related stigma in healthcare: Barriers to access and care and evidence-based solutions. *Healthcare Management Forum, 30*(2), 111–116. https://doi.org/10.1177/0840470416679413

Kolb, K., Liu, J., & Jackman, K. (2023). Stigma towards patients with mental illness: An online survey of United States nurses. *International Journal of Mental Health Nursing, 32*(1), 323–336. https://doi.org/10.1111/inm.13084

Lien, Y.-Y., Lin, H.-S., Tsai, C.-H., Lien, Y.-J., & Wu, T.-T. (2019). Changes in attitudes toward mental illness in healthcare professionals and students. *International Journal of Environmental Research and Public Health, 16*(23), Article 4655. https://doi.org/10.3390/IJERPH16234655

Lopes, I. C. P. (2020). *Validation of the Portuguese version of community attitudes towards people with mental ilness (CAMI) [Master´s dissertation, Escola Superior de Saúde do Politécnico do Porto]*. Escola Superior de Saúde do Politécnico do Porto.

Lyon, A. S., & Mortimer-Jones, S. M. (2020). The relationship between terminology preferences, empowerment and internalised stigma in mental health. *Issues in Mental Health Nursing, 42*(2), 183–195. https://doi.org/10.1080/01612840.2020.1756013

Marangu, E., Mansouri, F., Sands, N., Ndetei, D., Muriithi, P., Wynter, K., & Rawson, H. (2021). Assessing mental health literacy of primary health care workers in Kenya: A cross-sectional survey. *International Journal of Mental Health Systems, 15*, Article 55. https://doi.org/10.1186/s13033-021-00481-z

Marôco, J. (2018). *Análise Estatística com o SPSS Statistics [Statistical Analysis with SPSS Statistics]*. (7th ed.). ReportNumber.

Minas, H., Zamzam, R., Midin, M., & Cohen, A. (2011). Attitudes of Malaysian general hospital staff towards patients with mental illness and diabetes. *BMC Public Health, 11*, Article 317. https://doi.org/10.1186/1471-2458-11-317

Monteiro, M. C., Santos, O., & Céu Costa, M. (2013). Continuous Care Units: A response to aging and dependency in Portugal. *Biomedical and Biopharmaceutical Research, 10*(2), 163–178. https://doi.org/10.19277/bbr.10.2.61

Moreira, A.-R., Oura, M.-J., & Santos, P. (2021). Stigma about mental disease in Portuguese medical students: A cross-sectional study. *BMC Medical Education, 21*, Article 265. https://doi.org/10.1186/S12909-021-02714-8

Pestana Maria, G. J. (2014). *Análise de Dados para Ciências Sociais- A complementaridade do SPSS [Data Analysis for Social Sciences - The complementarity of SPSS]*. (6th ed.). Sílabo.

Pinto, I. C., Bernardo, M., Sousa, S., & Curral, R. (2020). Evaluation of mental health stigma on medical education: An observational study with Portuguese medical students. *Porto Biomedical Journal, 5*(4), Article e074. https://doi.org/10.1097/J.PBJ.0000000000000074

Raj, C. T. (2022). The effectiveness of mental health disorder stigma-reducing interventions in the healthcare setting: An integrative review. *Archives of Psychiatric Nursing, 39*, 73–83. https://doi.org/10.1016/J.APNU.2022.03.005

Rivera-Segarra, E., Varas-Díaz, N., & Santos-Figueroa, A. (2019). "That's all Fake": Health professionals stigma and physical healthcare of people living with Serious Mental Illness. *PLOS ONE, 14*(12), Article e0226401. https://doi.org/10.1371/JOURNAL.PONE.0226401

Serviço Nacional de Saúde. (2023). *Administração Central do Serviço de Saúde [Central Administration of the Health System, IP]*. https://www.sns.gov.pt/entidades-de-saude/administracao-central-do-sistema-de-saude/

Sweileh, W. M. (2021). Global research activity on mental health literacy. *Middle East Current Psychiatry, 28*, Article 43. https://doi.org/10.1186/s43045-021-00125-5

Simões de Almeida, R., Trigueiro, M. J., Portugal, P., de Sousa, S., Simões-Silva, V., Campos, F., Silva, M., & Marques, A. (2023). Mental health literacy and stigma in a municipality in the north of Portugal: A cross-sectional study. *International Journal of Environmental Research and Public Health, 20*(4), Article 3318. https://doi.org/10.3390/IJERPH20043318

Sousa, S., Marques, A., Curral, R., & Queirós, C. (2012). Stigmatizing attitudes in relatives of people with schizophrenia: A study using the Attribution Questionnaire AQ-27. *Trends in Psychiatry and Psychotherapy, 34*(4), 186–197. https://doi.org/10.1590/s2237-60892012000400004

Sousa, S., Queirós, C., Marques, A., Rocha, N., & Fernandes, A. (2008). *Versão preliminar portuguesa do Attribution Questionnaire (AQ-27) [Preliminary Portuguese version of the Attribution Questionnaire (AQ-27)]*. Faculdade de Psicologia e Ciências de Educação da Universidade do Porto.

Subu, M. A., Wati, D. F., Netrida, N., Priscilla, V., Dias, J. M., Abraham, M. S., Slewa-Younan, S., & Al-Yateem, N. (2021). Types of stigma experienced by patients with mental illness and mental health nurses in Indonesia: A qualitative content analysis. *International Journal of Mental Health Systems, 15*, Article 77. https://doi.org/10.1186/S13033-021-00502-X

Taylor, S. M., & Dear, M. J. (1981). Scaling community attitudes toward the mentally ill. *Schizophrenia Bulletin, 7*(2), 225–240. https://doi.org/10.1093/SCHBUL/7.2.225

Tyerman, J., Patovirta, A. L., & Celestini, A. (2020). How stigma and discrimination influences nursing care of persons diagnosed with mental illness: A systematic review. *Issues in Mental Health Nursing, 42*(2), 153–163. https://doi.org/10.1080/01612840.2020.1789788

Unidade de Gestão e Acompanhamento da Rede Nacional de Cuidados Continuados Integrados. (2022). *Guia Prático – Rede Nacional de Cuidados Continuados Integrados [Practical Guide – National Integrated Continuing Care Network*]. Instituto Da Segurança Social, I.P.

WMA. (2001). World Medical Association Declaration of Helsinki: Ethical principles for medical research involving human subjects. *Bulletin of World Health Organization, 79*(4), 373–374. https://iris.who.int/bitstream/handle/10665/268312/PMC2566407.pdf

World Health Organization. (2022). *WHO European framework for action on mental health 2021–2025*. WHO Regional Office for Europe. https://www.who.int/europe/publications/i/item/9789289057813

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RESEARCH ARTICLE

Mental Health Literacy Level of University Students Enrolled in Health Departments: A Descriptive Study in Turkey

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Introduction: Good mental health literacy (MHL) enables an individual to access, understand, and use information in a way that promotes and maintains good mental health and facilitates early referral to mental health services. The literature reports that MHL levels among adolescents are gradually increasing, but still remain at low/moderate levels, and that this situation bears a negative impact on both individual and societal health.
Aims: The Authors of this study aim to determine the level of MHL among university students engaged in the field of health, the factors that influence this level, and the differences between the various fields.
Methods: The sample of this cross-sectional study consisted of 1,227 students enrolled in a university health department between 1 December 2022 and 20 January 2023. Data were collected online using a questionnaire designed by the researchers, and applying the MHL Scale (MHLS). We used descriptive statistics, one-sample t-test, one-way ANOVA test, multiple comparison tests (Tukey) and multiple linear regression in the statistical analysis.
Results: The mean MHLS score of health faculty students was moderate (15.88, SD = 3.30). Female students, students aged >20 years and medicine, dentistry or nursing students had higher MHLS scores than others (p < .050).
Conclusions: We observed that university students in the health sector did not have the desired or expected level of MHL. Improving MHL has the potential to facilitate early intervention, ensuring effective community mental health promotion and support; therefore, educational programs should be developed for this group.

Keywords: health department, university student, mental health literacy level, mental health, health education

Introduction

Mental disorders account for one-third of young people's disease burden worldwide (Auerbach et al., 2018; Elyamani et al., 2021; Jung et al., 2016). An international study conducted in 2018 showed that the lifetime prevalence of mental illness among university students stood at 35.3% (Auerbach et al., 2018). Owing to the COVID-19 pandemic, whose global effects have been ongoing for almost three years, the incidence of mental disorders has increased, making mental health a priority (Aguirre Velasco et al., 2020; Gavin et al., 2021; Lai et al., 2022; Nobre et al., 2021). COVID-19 has now been effectively brought under control through the collective efforts of society as a whole; social order has gradually improved; and psychological distress has been alleviated

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with the pandemic's effective prevention and control. Nevertheless, more research remains needed to determine the impact of this pandemic on public mental health, the prevalence of mental illness in the short and long term, and how it may shape needs related to this issue (Gavin et al., 2021).

Most mental disorders (75.0%) begin in adolescence (12–24 years) but are usually detected later (Aguirre Velasco et al., 2020; Auerbach et al., 2018). Poor mental health negatively affects all aspects of young people's lives, particularly education and health; it bears a lasting impact on their health and social functioning in adulthood; and increases the risk of premature death (Aguirre Velasco et al., 2020; Elyamani et al., 2021; Morgado et al., 2021; Reis et al., 2022). Researchers therefore recognize mental disorders in young people to be a global public health issue (Aguirre Velasco et al., 2020; Auerbach et al., 2018; Elyamani et al., 2021; Morgado et al., 2021; Nobre et al., 2021; Reis et al., 2022). Despite this huge burden of disease, however, studies worldwide show that 70.0%–80.0% of young people do not seek the required mental health services they need due to the lack of information as well as negative and false beliefs (Aguirre Velasco et al., 2020; Nobre et al., 2021, Seki Öz, 2021). Mental health literacy (MHL) is the knowledge and skills needed to improve mental health (Elyamani et al., 2021; Jung et al., 2016; Kutcher et al., 2016; Morgado et al., 2021; Nobre et al., 2021). In other words, mental health literacy (MHL) refers to the understanding and competencies that are essential for improving mental well-being and constitutes a key determinant of mental health status. (Elyamani et al., 2021; Jung et al., 2016; Kutcher et al., 2016; Morgado et al., 2021; Nobre et al., 2021; Reis et al., 2022). Low levels of MHL can lead to young people being unaware of mental health problems in themselves or those around them, being unable to access professional help, or seeking inappropriate help and not receiving effective treatment (Jung et al., 2016; Polat Olca, 2023). Therefore, defining the knowledge, beliefs, and attitudes of individuals, especially young people, towards mental health problems is the first step in developing services and policies for community mental health (Elyamani et al., 2021; Jung et al., 2016; Kutcher et al., 2016).

MHL is an important strategy to encourage society to take action for better mental health (Aguirre Velasco et al., 2020; Morgado et al., 2021). Good MHL will enable individuals to access, understand, and use information in a way that promotes and maintains good mental health and facilitates referral to mental health services as early as possible (Jung et al., 2016). However, inadequate MHL is a global problem, particularly in developing countries (Kutcher et al., 2016).

Although most of the international literature on MHL before the COVID-19 pandemic focuses on developed countries, these studies report that MHL levels of the general population and adolescents have gradually increased but remain low/moderate and that low MHL is responsible for poor health outcomes and high suicide rates in societies (Kutcher et al., 2016; Nobre et al., 2021; Özer & Altun, 2022). Gaps exist in the literature regarding MHL after the COVID-19 pandemic in developing countries with diverse cultures, such as Turkey, so more studies are needed (Özer & Altun, 2022; Kantaş Yılmaz & Ünkür, 2023). Turkey, classified as a developing country, is characterized by its young population. Considering that most mental disorders occur in the young population, Turkey stands at risk in terms of mental disorders (Özer & Altun, 2022).

We conducted this study to determine the MHL among students in health departments and the factors influencing them. We included health department students because the responsibilities they will be taking on in the future will enable themselves, and the group they will serve, to protect and improve mental health, improve attitudes towards people with mental illness, reduce stigma, and encourage people with mental illness to benefit from health services at an optimal level. In Turkey, medical education has a curriculum of six years, dentistry five years, nursing four years and health services two years. In the future, these students will also assume decisive and influential roles in public health as health professionals. All these measures will have a positive impact on the quality of patient care and the community's mental health (Özer & Altun, 2022; Öztaş & Aydogan, 2021; Seki Öz, 2021).

Methods

Participants and Data Collection

We employed a descriptive and cross-sectional design in this study. The reporting of this study conforms to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement guidelines for the reporting of observational studies (Ghaferi et al., 2021).

We conducted the study between 1 December 2022 and 20 January 2023 with 1,665 students enrolled in the health faculties (nursing, medicine, dentistry and the vocational school of health services) of Harran University, and continuing active education. Research data were collected by sharing an online survey link with the students.

We created the survey with Google forms, explained the study's purpose to the participants via the online link, and obtained their consent. Consents and forms collected by the researchers were recorded and stored digitally. The confidentiality of student responses was ensured, and responses on Google forms were only viewed through the researchers' e-mail accounts. The response time for the questionnaire ranged between 5–10 minutes.

To conduct the study, the necessary permissions were obtained from the relevant institution, the University Clinical Research Ethics Committee (Date: 31.10.2022, Issue: HRU.22.21.03), the Rectorate, and the health departments of the relevant university. Permission to use the MHLS was obtained from the researchers who conducted the Turkish reliability and validity study of the measurement instruments used. Before completing the survey, we informed the students about the study on the first page of the online link, asking them to check "I agree to participate in the study" if they agreed to participate in the study. Students were informed that they had the right to withdraw from the study at any time and that their participation in the study was voluntary. Students who completed the form online were considered to have agreed to participate in the study.

This study used convenience sampling to reach individuals. Out of the 1,665 students of the health faculties, the study was completed with 1,227 students who voluntarily agreed to participate (participation rate: 75.0%). As the online survey link was used for the research data, 300 people never accessed the link and 138 people did not answer all the questions in the survey. The mean age of the students participating in the study stood at 20.87 (*SD* = 2.50) years (17-39), and 71.9% of the students were women. Almost all of the students were single (97.0%). Table 1 shows other characteristics of the students. It was found that almost all of the students failed to receive any mental health help (92.7%), had no family members with a medical diagnosis related to mental health (87.0%), and 85.7% of the students did not receive any training on mental health.

Table 1. Sociodemographic Characteristics of Students

Characteristics		*n*	%
Gender	Males	345	28.1%
	Females	882	71.9%
Place of Longest Residence	City	778	64.4%
	District	270	22.0%
	Village	179	14.6%
Current Residence	At Home With Family	626	51.0%
	Home alone or with Relatives	98	8.0%
	Dormitory	503	41.0%
Department	Medical or Dental	163	13.3%
	Nursing	454	37.0%
	Vocational School of Health Services	610	49.7%
Year of Education	First year	472	38.5%
	Second year	369	30.0%
	Third ≥ year	386	31.5%
Previous Mental Health Training	Yes	176	14.3%
	No	1,051	85.7%

Note. *N* = 1,227. Participants were on average 20.85 years old (*SD* = 2.50)

Measures

Research data were collected using a researcher-developed survey form, as well as the MHL Scale (MHLS). The form consisted of seven questions describing socio-demographic characteristics (age, gender, education, etc.) and five questions about mental health and health status ("Have you ever received professional mental health help?", "Are you taking psychiatric medication?", etc.).

Mental Health Literacy Scale (MHLS)

The original MHLS was developed by Jung et al. (2016). The Turkish validity and reliability of the scale was conducted by Göktaş et al. (2019). The MHLS consists of 22 items and three sub-dimensions. There are ten items in the knowledge-oriented MHL (KO-MHL) sub-dimension, eight items in the belief-oriented MHL (BO-MHL) sub-dimension, and four items in the resource-oriented MHL (RO-MHL) sub-dimension. The 18 items in the scale's first two sub-dimensions are from the six-point Likert-scales. The four items in the RO-MHL sub-dimension are answered as "yes" and "no." The scores are calculated by assigning one point to "strongly agree," "agree," and "yes" responses and no points to any other responses. Items 11–18 of the scale are coded inversely. The total score that can be obtained from the scale varies between 0 and 22 (Göktaş et al., 2019). The total score provides information about the individual's MHL level. The higher the score on the scale, the better the MHL level. A cut-off score was not calculated for the scale. Cronbach's alpha coefficient we calculated at α = .71 by Göktaş et al. (2019), and it was found to be α = .84 for knowledge-oriented MHL, α = .75 for belief-oriented MHL, α = .73 for resource-oriented MHL, and α = .72 for total MHL. The validity of the MHL scale was not measured, only the reliability.

Statistical Analysis

The **s**tatistical analysis of the data was performed using the SPSS 20.0 package program. The dependent variable is the perceived level of MHL. The independent variables are: students' department, year of education, place of residence, place of longest residence, gender, age, educational status, and mental health knowledge level. We found that the data showed a normal distribution, skewness and kurtosis. Descriptive statistics (numbers, percentages, and mean values), the one-sample t test, one-way ANOVA test, and multiple comparison tests (Tukey) were applied to evaluate the data. We performed multiple linear regression analysis with the variables having significant differences. Multiple linear regression analysis was performed between the total scores of the scale and the students' age and grade. $p < .05$ was accepted as a significant difference in all analyses.

Results

As Table 2 shows, it was found that the health students' mean scores on the total and sub-dimensions of the MHL scale stood at a moderate level compared to the maximum score that could be obtained.

Table 2. Mean MHLS Scores of the Students

Overall Scale and Subscales	Full						
	M	*SD*	*Min*	*Max*	*Value*	*Sk*	*Kt*
Knowledge-Oriented MHL	7.78	2.40	0	10	10	-1.58	2.24
Belief-Oriented MHL	5.87	2.05	0	8	8	-1.48	1.80
Resource-Oriented MHL	2.22	1.51	0	4	4	-0.20	1.42
Total	15.88	3.30	2	22	22	-0.52	-0.41

Notes. Mental Health Literacy. *M:* Mean, *SD:* Standard Deviation, *Min:* Minimum, *Max:* Maximum *Sk* = Skewness; *Kt* = Kurtosis. *N* = 1,227.

Table 3 shows the MHLS scores with respect to the students' socio-demographic characteristics. Accordingly, in the KO-MHL, BO-MHL sub-dimension and total MHL, women students exhibited significantly higher scores than men students did.

Table 3. MHLS Scores According to Socio-Demographic Characteristics of the Students

Variables		Knowledge-Oriented			Belief-Oriented			Resource-Oriented			Total		
		M *(SD)*	*p*	d / ηρ²	M *(SD)*	*p*	d / ηρ²	M *(SD)*	*p*	d / ηρ²	M *(SD)*	*p*	d / ηρ²
AgeGender [a]	Female	7.98*(2.21)*	.001	2.181	5.99*(1.88)*	.001	0.254	2.23*(1.47)*	.622		16.21*(3.15)*	.001	0.342
	Male	2.29*(2.94)*			5.56*(2.42)*			2.19*(1.61)*			15.05*(3.63)*		
Age [a]	≤ 20 years	7.60*(2.39)*	.007	0.152	5.76*(2.06)*	.054		2.13*(1.51)*	.043	0.112	15.50*(3.16)*	.001	0.231
	>20 years	7.97*(2.51)*			5.99*(2.04)*			2.31*(1.51)*			16.27*(3.47)*		
Place of Longest Residence [b]	City	7.75*(2.50)*	.805		5.93*(2.07)*	.119		2.23*(1.51)*	.450		15.92*(3.41)*	.854	
	District	7.86*(2.38)*			5.65*(2.24)*			2.27*(1.50)*			15.78*(3.26)*		
	Village	7.81*(2.39)*			5.98*(1.66)*			2.09*(1.52)*			15.88*(3.11)*		
Current Residence [b]	At home with family	7.66*(2.62)*	.170		5.85*(2.07)*	.931		2.30*(1.52)*	.172		15.81*(3.51)*	.741	
	Home alone or with Relatives	7.79*(2.40)*			5.88*(2.22)*			2.19*(1.57)*			15.87*(3.24)*		
	Dormitory	7.94*(2.25)*			5.90*(2.00)*			2.13*(1.48)*			15.97*(3.12)*		
Department [b]	(1) Medical or Dental	8.22*(1.73)*	.001	0.011	6.37*(1.55)*	.001	0.014	1.84*(1.49)*	.003	0.009	16.44*(2.77)*	.001	0.015
	(2) Nursing	7.96*(2.67)*	1–3: .005		5.98*(2.22)*	1-3: . 027		2.27*(1.47)*	1–2: .005		16.23*(3.74)*	1–3: .003	
	(3) Vocational School of Health Services	7.53*(2.44)*	2–3: .014		5.66*(2.02)*	2-3: .001		2.28*(1.53)*	1–3: .003		15.48*(3.10)*	2–3: .001	
Year of Education [b]	(1) First year	7.42*(2.40)*	.001	0.016	6.02*(1.73)*	.001	0.012	2.15*(1.50)*	.460		15.59*(3.16)*	.001	0.012
	(2) Second year	7.86*(2.35)*	1–2: .005		5.53*(2.25)*	2–1: . 027		2.28*(1.52)*			15.68*(3.14)*	1–3: .003	
	(3) Third ≥ year	8.15*(2.57)*	1–3: .014		6.03*(2.18)*	2–3: . 001		2.24*(1.50)*			16.43*(3.65)*	2–3: .001	
Previous Mental Health Training [a]	Yes	8.48*(1.91)*	.001	0.36	6.04*(1.90)*	.243		2.84*(1.27)*	.001	0.521	17.37*(3.07)*	.001	0.542
	No	7.67*(2.52)*			5.84*(2.08)*			2.11*(1.52)*			15.63I*(3.31)*		

Notes. [a] Independent sample t-test with Cohen's d (d) as effect size; [b] One-Way ANOVA with partial eta-squared (ηρ²) as effect size and Post Hoc Test with Tukey correction

When the age variable was taken into account, we found that the mean scores of the KO-MHL, RO-MHL sub-dimensions and the total MHL scores of students aged 20 years and under were statistically significantly lower than those of students aged 20 years and over.

It was found that the mean scores on the total and sub-dimensions of the MHL scale were not statistically significant according to the place where the students had lived the longest and the place where they were staying.

When we examined the mean scores on the total and sub-dimensions of the MHL scale according to the students' department, we found that the group of students exhibiting the lowest score on the KO-MHL sub-dimension were the persons studying at the Vocational School of Health Services, and the difference between the groups was due to this group. As for BO-MHL and Total MHL, it was found that the mean score of the individuals studying at the Vocational School of Health Services stood lower than that of the other departments and the difference was significant due to this group.

On the RO-MHL scale, we found that persons studying in the Faculties of Medicine and Dentistry demonstrated lower scores than did students in the Nursing and Health Professions Schools, and the difference between the groups was due to this group.

When the students' mean scores on the scale were examined according to their university class status, we found that first-year students reached the lowest mean score on the KO-MHL and the difference between the groups existed due to the first-year students compared to the second and third year and above students. In BO-MHL, the lowest mean score belonged to the second-year students and the statistical difference between the groups was due to the second-year students.

When the total MHLS and sub-dimension scores were examined according to whether the students received any mental health education, it was observed that the KO-MHL, RO-MHL, and total MHLS scores of the students who stated that they received mental health education stood significantly higher than those of the students who did not receive any education.

Table 4. Regression Coefficients and MHL Scale Total Scores

Independent variable	*B*	*SE(B)*	*β*	*t*	*p*
Age	0.78	0.21	.11	3.66	.001
Year of Education	0.17	0.21	.02	0.81	.418
Gender 1 = Female 0 = Male	1.44	0.20	.19	6.97	.001
Previous Mental Health Training 1 = Yes 2 = No	1.66	0.26	.16	6.04	.001
Department 1 = Vocational School of Health Services 2 = Medical or Dental or Nursing	-0.69	0.19	.10	-3.63	.001

Notes. R2 = .08, F(5, 1221) = 22.89, $p < .001$
B = unstandardized regression coefficient; SE(B) = standard error for the unstandardized regression coefficient; β = standardized regression coefficient

In this study, we found that there was a positive correlation between the total MHL level with increasing age and years of education, and that female gender and previous mental health education positively increased the MHL level. On the other hand, it we found that being a student at a vocational school for health services decreased the MHL level.

Discussion

Identifying the mental health knowledge and beliefs of prospective health professionals is an integral part of developing targeted education and mental health promotion initiatives. It is apparent, therefore, that a need exists for university students to be well informed about mental health so that they are able to independently take action

when at risk, build foundational knowledge of how to recognize symptoms, and appropriately seek help (Reis et al., 2022). The mean MHLS score of the university students engaged in the departments of nursing, medicine, dentistry, and the vocational school of health services was 15.88 (*SD* = 3.30). In a study conducted in Turkey with the same scale and health students, the total MHL was 14.53 (*SD* = 3.31) (Kantaş Yılmaz & Ünkür, 2023). Considering that the highest score that can be obtained on this scale is 22, the students' knowledge level is moderate. We observed that the students' mean sub-dimension scores stood at a moderate level, similar to the total score of the MHLS. A study examined the MHL-level of healthcare workers in Turkey at the beginning of the COVID-19 pandemic (between March and May 2020), when there were many uncertainties and anxiety increased accordingly. The healthcare workers' mean MHLS score was found to be 16.96 (*SD* = 3.30), and it was found that the MHL levels of healthcare workers were not at the desired level (Öztaş & Aydogan, 2021). Another study was conducted between September 8 and 10, 2021, among individuals living in a city center. The study examined the level of MHL and found that the mean MHLS score was 14.76 (*SD* = 3.67) (Seki Öz, 2021). The COVID-19 pandemic had a negative impact on the mental health of the population, and its effects are still ongoing, albeit less intensely compared to previous years. University students actively experienced the COVID-19 pandemic and had the opportunity to see its effects on mental health both in themselves and in society. Under these conditions, university students in the health department are expected to increase their mental health related knowledge and practice; however, the scores obtained from the scale are not at the desired level. It was found that the health students' MHL levels did not differ from the results in the research done with other groups (Lee et al., 2020a; Lee et al., 2020b; Miles et al., 2020; Seki Öz, 2021). According to our results, these students' expected higher MHL awareness remains insufficient; therefore, the content of the courses they take on the topic of mental health should be reconsidered. It is thus necessary to investigate why young people's knowledge and practices regarding mental problems are not at the desired level.

In the present study, we found that female students scored higher than male students on the total scale and the KO-MHL sub-dimension than male students. This finding is also consistent with other studies conducted during the pandemic (Kantaş Yılmaz & Ünkür, 2023; Lee et al., 2020a; Lee et al., 2020b; Miles et al., 2020; Seki Öz, 2021). However, one study reported no difference between men and women participants (Öztaş & Aydogan, 2021). These findings indicate that women have more knowledge about mental health, are better able to recognize mental disorders, and are more likely to seek professional mental health services.

In the present study, total MHLS and sub-dimension scores increased with increasing age. One study reported that participants in the 28–32 age group had higher levels of MHLS (Miles et al., 2020). Other studies did not report age-related results (Lee et al., 2020a; Lee et al., 2020b; Öztaş & Aydogan, 2021; Seki Öz, 2021). This is most likely because as the age of university students enrolled in health departments increases, their knowledge of and experience with mental health also increases. In this study, a low correlation was found between age and the total MHL scale. This result suggests that more important factors than age should be considered in the mental health literacy level of students.

In the present study, it was found that the lowest mean score on the KO-MHL belonged to first-year students and the difference between the groups was due to this specific group, while the highest score on the total-MHL belonged to students in grade three and above; this group accounted for the difference between the three groups. This result is expected, since the level of knowledge about mental health increases as the grade level of the students increases. These results are consistent with the literature (Jafari et al., 2021; Lee et al., 2020a; Lee et al., 2020b; Miles et al., 2020; Öztaş & Aydogan, 2021; Seki Öz, 2021). They indicate that unlike age, class status is not a significant factor in terms of increasing the mental health literacy level of students, and there are more important factors affecting it.

One of the most important results of the present article is the analysis of MHL based on the student's field of study. According to this, the total MHLS, BO-MHL, and KO-MHL scores obtained by the students anrolled in the Vocational School of Health Services, which is a two-year program, were lower than those obtained by nursing students with four years of education, medical students with six years of education, and dental students with five years of education. To the best of our knowledge, no study has compared these results yet. This result is most likely due to the courses taken by the students in their respective curricula. Although the educational content of each department is different, it remains important to increase the number of courses on mental health, especially for health department students. A study conducted with 1,213 university students found that those who took courses on mental health issues or had experience in this area demonstrated higher MHL (Miles et al., 2020). One of the interesting findings obtained in the present study is that medical and dental students scored lower in the resource-oriented MHL sub-dimension compared to students in other departments. Resource-oriented questions

include where to go, where to look/call for mental health services, and where to get information. However, medical students, who are expected to have knowledge on this subject, had lower scores in this sub-dimension. This shows that interventions are needed to address this gap. A review conducted before the COVID-19 pandemic found low levels of MHL among doctors, nurses, and other relevant health professionals (Elyamani et al., 2021). This can constitute a real barrier to providing effective mental health services.

In this study, although the effects of age, gender, faculty and previous educational status variables on the total MHL were significant, the total variance explained remained low. This suggests that the above factors may not need to be taken into account in any intervention to increase students' MHL.

Strengths and Limitations

One of the strengths of this study is that the sample size stands quite large compared to that of previous studies. However, the results may have been limited by the fact that the study was conducted over a period of time and focused on the relationship between participants' MHL levels and their influencing factors. Another limitation involves the use of convenience sampling.

Conclusion, Implications, and Future Directions

The results we garnered in the present study indicate that the MHL level of university students enrolled in health departments did not reach the desired and expected levels, and that gender, age, department, year of education, and receiving education on mental health bore an effect on MHL levels.

We recommend many steps that must be taken to improve MHL in Turkey, a developing country with a young population. Improved MHL has the potential to facilitate early intervention, enhance mental health promotion, and enable effective community support. In addition, initiatives to improve the MHL level of future health professionals will surely have a positive impact on future patient outcomes. We recommended that interventions to increase the awareness and MHL levels of health department students should be planned, implemented, evaluated, and – where appropriate – integrated into the educational curriculum.

Students majoring in health departments and by virtue of the responsibilities they will assume in the future, will empower themselves and the group they will serve in the future to protect and improve mental health, better attitudes towards people suffering mental illness, reduce stigma, and enable people with mental illness to benefit from health services at an optimal level. These students will also play a crucial and influential role in public health as health professionals in the future. All of these interventions will have a positive impact on the quality of patient care and community mental health.

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Author contribution
Selma KAHRAMAN: conceptualization, design, methodology, funding acquisition, investigation, project administration, data management, formal analysis, interpretation, supervision, writing original draft, writing review and editing.
Suzan HAVLİOGLU: conceptualization, design, methodology, funding acquisition, investigation, data management, formal analysis, interpretation, writing original draft.
Özlem KAÇKİN: design, funding acquisition, investigation, data management, interpretation, supervision, writing original draft.

Declaration of interest statement
No conflict of interest has been declared by the authors.

Ethical statement

This manuscript is the authors' original work.
All participants engaged in the research voluntarily and anonymously.
Their data are stored in coded materials and databases without personal data.
The studies involving human participants were reviewed and approved by the Noninvasive Clinic Ethical Committee of the Medical Faculty at Harran University (Date: 31.10.2022, Issue: HRU.22.21.03)

Data availability statement

Datasets presented in this article are available from the corresponding author upon reasonable request.

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References

Aguirre Velasco, A., Cruz, I. S. S., Billings, J., Jimenez, M., & Rowe, S. (2020). What are the barriers, facilitators and interventions targeting help-seeking behaviours for common mental health problems in adolescents? A systematic review. *BMC Psychiatry, 20*, Article 293. https://doi.org/10.1186/s12888-020-02659-0

Auerbach, R. P., Mortier, P., Bruffaerts, R., Alonso, J., Benjet, C., Cuijpers, P., Demyttenaere, K., Ebert, D. D., Green, J. G., Hasking, P., Murray, E., Nock, M. K., Pinder-Amaker, S., Sampson, N. A., Stein, D. J., Vilagut, G., Zaslavsky, A. M., Kessler, R. C., & WHO WMH-ICS Collaborators. (2018). WHO World Mental Health Surveys International College Student Project: Prevalence and distribution of mental disorders. *Journal of Abnormal Psychology, 127*(7), 623–638. https://doi.org/10.1037/abn0000362

Elyamani, R., Naja, S., Al-Dahshan, A., Hamoud, H., Bougmiza, M. I., & Alkubaisi, N. (2021). Mental health literacy in Arab states of the Gulf Cooperation Council: A systematic review. *PloS One, 16*(1), Article e0245156. https://doi.org/10.1371/journal.pone.0245156

Gavin, B., Lyne, J., & McNicholas, F. (2021). The global impact on mental health almost 2 years into the COVID-19 pandemic. *Irish Journal of Psychological Medicine, 38*(4), 243–246. https://doi.org/10.1017/ipm.2021.75

Ghaferi, A. A., Schwartz, T. A., & Pawlik, T. M. (2021). STROBE Reporting guidelines for observational studies. *JAMA Surgery*, *156*(6), 577–578. https://doi.org/10.1001/jamasurg.2021.0528

Göktaş, S., Işıklı, B., Önsüz, M. F.,Yenilmez, Ç., & Metintaş, S. (2019). Ruh Sağlığı Okuryazarlığı Ölçeği'nin (Rsoy Ölçeği) Türkçe Geçerlilik ve Güvenilirliğinin Değerlendirilmesi [Evaulation of validity and reliability of the Turkish version of the Mental Health Literacy Scale (Mhl Scale)]. *Konuralp Medical Journal*, *11*(3), 424–431. https://doi.org/10.18521/ktd.453411

Jafari, A., Nejatian, M., Momeniyan, V., Barsalani, F. R., & Tehrani, H. (2021). Mental health literacy and quality of life in Iran: A cross-sectional study. *BMC Psychiatry, 21*, Article 499. https://doi.org/10.1186/s12888-021-03507-5

Jung, H., von Sternberg, K., & Davis, K. (2016). Expanding a measure of mental health literacy: Development and validation of a multicomponent mental health literacy measure. *Psychiatry Research*, *243*, 278–286. https://doi.org/10.1016/j.psychres.2016.06.034

Kantaş Yilmaz, F., & Ünkür P. (2023). Determination of mental health literacy, help-seeking behaviours and psychological distress levels of health science students. *Journal of Health Literacy, 7*(4), 9–20. https://doi.org/10.22038/jhl.2022.66098.1308

Kutcher, S., Wei, Y., & Coniglio, C. (2016). Mental health literacy: Past, present, and future. *The Canadian Journal of Psychiatry, 61*(3), 154–158. https://doi.org/10.1177/0706743715616609

Lai, H.-J., Lien, Y.-J., Chen, K.-R., & Lin, Y.-K. (2022). The effectiveness of mental health literacy curriculum among undergraduate public health students. *International Journal of Environmental Research and Public Health, 19*(9), Article 5269. https://doi.org/10.3390/ijerph19095269

Lee, H. Y., Hwang, J., Ball, J. G., Lee, J., Yu, Y., & Albright, D. L. (2020a). Mental health literacy affects mental health attitude: Is there a gender difference? *American Journal of Health Behavior, 44*(3), 282–291. https://doi.org/10.5993/AJHB.44.3.1

Lee, H. Y., Hwang, J., Ball, J. G., Lee, J., & Albright, D. L. (2020b). Is health literacy associated with mental health literacy? Findings from Mental Health Literacy Scale. *Perspectives in Psychiatric Care, 56*, 393–400. https://doi.org/10.1111/ppc.12447

Miles, R., Rabin, L., Krishnan, A., Grandoit, E., & Kloskowski, K. (2020). Mental health literacy in a diverse sample of undergraduate students: Demographic, psychological, and academic correlates. *BMC Public Health*, *20*(1), Article 1699. https://doi.org/10.1186/s12889-020-09696-0

Morgado, T., Loureiro, L., Rebelo Botelho, M. A., Marques, M. I., Martínez-Riera, J. R., & Melo, P. (2021). Adolescents' empowerment for mental health literacy in school: A pilot study on ProLiSMental psychoeducational intervention. *International Journal of Environmental Research and Public Health, 18*(15), Article 8022. https://doi.org/10.3390/ijerph18158022

Nobre, J., Oliveira, A. P., Monteiro, F., Sequeira, C., & Ferré-Grau, C. (2021). Promotion of mental health literacy in adolescents: A scoping review. *International Journal of Environmental Research and Public Health, 18*(18), Article 9500. https://doi.org/10.3390/ijerph18189500

Özer, D., & Altun Ö. Ş. (2022). Ruh sağlığı okuryazarlığı: Farkındalık ile toplum ruh sağlığını güçlendirme [Mental health literacy: Strengthening community mental health through awareness]. *Psikiyatride Güncel Yaklaşımlar, 14*(2), 284–289. https://doi.org/10.18863/pgy.1016368

Öztaş, B., & Aydogan, A. (2021). Assessment of mental health literacy of health professionals. *Journal of Psychiatric Nursing, 12*(3), 198–204. https://doi.org/10.14744/phd.2021.43265

Polat Olca, S. (2023). Üniversite öğrencilerinin ruh sağlığı okuryazarlığı ve psikolojik sağlamlık düzeylerinin değerlendirilmesi [Evaluation of university students' mental health literacy and psychological resilience levels]. *Gümüşhane* Üniversitesi *Sağlık Bilimleri Dergisi, 12*(1), 118–126. doi.org/10.37989/gumussagbil.1097156

Reis, A. C., Saheb, R., Moyo, T., Smith, C., & Sperandei, S. (2022). The impact of mental health literacy training programs on the mental health literacy of university students: A systematic review. *Prevention Science,* 23, 648–662. https://doi.org/10.1007/s11121-021-01283-y

Seki Öz, H. (2021). Bir il nerkezinde yaşayan bireylerin ruh sağlığı okuryazarlığının incelenmesi [Investigation of mental health literacy of individuals living in a city center]. *Humanistic Perspective, 3*(3), 660–675. https://doi.org/10.47793/hp.993929

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RESEARCH ARTICLE

Emotion Recognition and Differentiation in Cannabis Abstainers Over Time: Assessing the Role of Mental Health Problems and Cannabis Withdrawal

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Introduction: Cannabis is the second most widely-used substance in India, after alcohol. Several researches show how cannabis use can impair emotion recognition capacity, but relatively few researchers have explored this among cannabis abstainers.
Aims: The present study's authors aimed at assessing emotion recognition, emotion differentiation, self-reported anxiety, depression, stress, withdrawal intensity and impact in a sample of men who abstain from cannabis.
Methods: Heavy cannabis users (N = 70 males) were assessed via questionnaires regarding their cannabis use frequency, their age at onset of usage, anxiety, depression, and stress levels as well as their performance on computerised tasks of emotion recognition and discrimination within 24 hours of their admission (T0), then after 15 days of abstinence (T1), and finally after 30 days of abstinence (T2). At T1 and T2, they were also assessed for withdrawal intensity and the impact of withdrawal on daily activities.
Results: Findings revealed that, with abstinence, successive improvement in emotion recognition and emotion differentiation developed, even after accounting for declines in psychological distress from T0 to T1. However, from T1 to T2, further declines in psychological distress and withdrawal impact mainly accounted for this improvement. Happiness was the best recognised and well-differentiated emotion while the poorest discrimination was observed for anger.
Conclusions: This study's findings corroborate and significantly add to the limited existing literature, demonstrating improved emotion recognition and differentiation due to initial cannabis abstinence, but later this improvement proceeds with a decline in distress and withdrawal impact.

Keywords: emotion recognition, emotion differentiation, abstinence, cannabis, withdrawal

Introduction

Human beings have long used psychoactive substances for their euphoric and mood-altering properties. In recent times, however, such use has increased manifold, to the point of addiction, leading to several pathologies, both physical and mental. Cannabis is the world's most popular illicit drug (Degenhardt et al., 2013). As per the recent World Drug Report 2018 (UNODC, 2018), nearly 3.9% of the world population in the age range of 15–64 years are current cannabis users (i.e., in the past 12 months). After alcohol, cannabis and opioids are the next commonly used substances in India. About 2.8% of the population (31 million individuals) in the age group of 10–75 years reports having used any cannabis product within the previous year (Ambekar et al., 2019).

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Cannabis use has a high rate of comorbidity with affective disorders that often emerge during adolescence and young adulthood (Wittchen et al., 2007). However, despite several previous studies examining whether cannabis use increases the risk of anxiety or depression, or whether cannabis use is more common in these conditions, results are inconclusive (National Academies of Sciences, Engineering, and Medicine, 2017). Some researchers have found that cannabis use, particularly heavy use, may increase the risk of subsequent depression (e.g., see review by Gobbi et al., 2019), while others have been unable to draw any firm conclusions (e.g., see review by Botsford et al., 2020). A high risk for cannabis use disorders has been suggested to influence the risk for the development of a major depressive disorder (Smolkina et al., 2017). On the other hand, a repeated cross-sectional study of 16,216 US adults (Gorfinkel et al., 2020) showed that those with depression increased their rates of cannabis use significantly faster than those without depression. Likewise, studies examining the relationship between cannabis use and anxiety show mixed results. Kedzior & Laeber (2014) found in their meta-analysis that cannabis use might increase anxiety risk. Another meta-analysis by Twomey (2017) noted it as a minor risk factor. However, the review by Botsford et al. (2020) found no link between cannabis use and anxiety, while Keatley et al. (2020) and Wittchen et al. (2007) showed anxiety often precedes cannabis use.

A possible mechanism underlying psychiatric comorbidities and mood symptoms in young cannabis users is abnormalities in the affective neural network, resulting in deficits in affective processing (Maple et al., 2019). One commonality of many disorders (including anxiety, depression, bipolar disorder, and psychosis) comorbid with cannabis use is a deficit in facial emotion processing (Bourke et al., 2010; Mogg et al., 2000; Morris et al., 2009), which serves as a critical aspect of functioning in human social networks (Phillips et al., 2003). Previous studies have shown reciprocal relationships between emotion recognition and mental health. While studies show poorer emotion recognition to be associated with anxiety (Easter et al., 2005; Demenescu et al., 2010; Pereira-Lima & Loureiro, 2015), depression (Demenescu et al., 2010; Pereira-Lima & Loureiro, 2015), and stress (Hänggi, 2004), studies also exist showing that these mental health difficulties may result in poor emotion recognition. For instance, by experimentally manipulating state anxiety in a controlled setting, Dyer et al. (2022) recently showed it to be associated with poor facial emotion recognition. Anxiety results in poor emotion recognition, particularly regarding angry faces (Jarros et al., 2012). A meta-analysis by Dalili et al. (2014) noted that depression is linked with a poor recognition of all the basic emotions, except sadness. Another recent meta-analysis found broad deficits in facial emotion recognition among patients with unipolar depression (Krause et al., 2021). Similarly, individuals with stress disorders, such as PTSD, are impaired at recognising facial emotions (Passardi et al., 2019). These findings indicate that anxiety, depression, and stress are strongly correlated with facial emotion recognition.

There is increasing evidence that drugs of abuse alter the processing of emotional information in ways that could be attractive to users. For instance, an investigation shows that tetrahydrocannabinol (THC) reduces the activation of the amygdala in response to threat-related faces, suggesting that THC may modify the salience of emotional stimuli, particularly negative or threatening stimuli (Ballard et al., 2012). This study reported that THC significantly impaired the recognition of facial fear and anger, and marginally impaired the recognition of sadness and happiness, but had no impact on affect ratings of emotional scenes. In another study, comparing the emotion recognition performance of cannabis users to controls, it was seen that cannabis users were slower in recognising the emotions of anger, happiness, and sadness compared to controls and also required more intensity of emotional information for recognition (Platt et al., 2010). A study examining performance during the matching of stimuli with a negative or a positive content indicated that after THC administration, performance accuracy decreased for stimuli with a negative but not for stimuli with a positive emotional content (Bossong et al., 2013). However, studies probing the importance of emotion intensity have yielded mixed findings. One study concluded that cannabis users had greater difficulty identifying more subtle emotions (Platt et al., 2010), while another reported that cannabis users were less accurate than controls only in recognizing more overt, unambiguous emotions (Hindocha et al., 2015). Yet another study found emotion recognition deficits only in more frequent and recent cannabis users (Huijbregts et al., 2014). A recent study (Cservenka & Donahue, 2024) states that young adults who frequently binge drink and use cannabis reported more socio-emotional difficulties and alexithymia symptoms compared to healthy controls, but showed no difference in emotion recognition accuracy.

Previous research on other substance use disorders has also reported facial emotion-processing deficits. For instance, Le Berre (2019) in their review notes that compared to healthy people, people with alcohol use disorder (AUD) have consistently demonstrated misinterpretations of simple and complex facial expressions or exaggerated estimations of emotional intensity in another's facial emotions (Castellano et al., 2015; D'Hondt et al., 2014; Donadon & de Lima Osorio, 2014; Erol et al., 2017; Marinkovic et al., 2009; Maurage, Campanella, Philippot, Martin, & De Timary, 2008; Maurage, Campanella, Philippot, Vermeulen, et al., 2008; Maurage et al., 2011). Along similar lines, two meta-analyses (Bora & Zorlu, 2017; Castellano et al., 2015) reported a significant facial

emotion recognition deficit existing among people with AUD, who find it particularly difficult to understand and interpret the emotions of anger and disgust. Among early abstinent AUD patients, it has been observed that while the recognition of happiness remains somewhat unaffected (Bora & Zorlu, 2017), they tend to identify emotions in neutral faces (Kornreich et al., 2013; Kornreich et al., 2016; Philippot et al., 1999). Similar findings are expected concerning abstinent cannabis users.

A surge of research interest can also be seen regarding abstinent cannabis users. For instance, a recent study indicated that depressive symptoms and cannabis use-related problems are generally indicative of cannabis withdrawal severity, whereas craving specifically predicted cannabis withdrawal during abstinence (Cousijn & Van Duijvenvoorde, 2018). Cannabis use has also been associated with abnormal facial emotion processing. According to the study of Bayrakçı et al. (2015), cannabis abstainers are less accurate in recognizing and discriminating between emotions. In this study, abstinent cannabis-dependent patients performed significantly worse than controls in the identification of negative facial emotions, but not positive emotions, even after an average abstinence period of 3.2 months.

Given the presence of mixed findings in the literature concerning emotional disorders, such as anxiety and depression associated with cannabis use, their interaction necessitates a further exploration. Further, except for Bayrakçı et al. (2015), emotional processing deficits (such as visual emotion recognition and discrimination) as manifested among abstinent users of cannabis have not been explored. An exploration of anxiety, depression, and stress among such abstainers is also lacking. A gap in the previous studies consists also in that the visual stimuli used in these studies were static in nature, which is less ecologically valid than dynamic stimuli (Dobs et al., 2018). Moreover, in contrast to the more manufactured appearance of fixed faces, dynamic facial cues can communicate a wide range of genuine emotions (Cohn & Schmidt, 2004; Kaulard et al., 2012).

Apart from the above-mentioned gaps in the literature and lack of a comprehensive and sufficient number of studies, it still needs to be seen how changes in the levels of anxiety, depression, stress and emotional processing occur with a gradual increase in the number of days into abstinence from cannabis. Sudden cessation of cannabis consumption can cause withdrawal symptoms that can last up to three weeks or even more in heavy cannabis users (Connor et al., 2021). It would also be interesting to explore how these changes in abstinent users are associated with the intensity and impact of withdrawal symptoms, which set in as abstinence from cannabis progresses. Findings from such explorations would meaningfully contribute to our understanding regarding the emotional difficulties of cannabis abstainers.

Based on the said gaps, the present study aimed at assessing differences in emotion recognition and emotion differentiation among a sample of cannabis abstainers with a history of high cannabis use. The study also explored differences in the levels of self-reported anxiety, depression, and stress among the abstainers as well as the intensity and impact of withdrawal symptoms among them. It was also of interest to see how changes in the perceived levels of anxiety, depression, stress, and/or withdrawal symptoms accounted for variations in emotion recognition and emotion differentiation with an increasing number of days into abstinence. It was hypothesised that the levels of anxiety, depression, stress, and withdrawal symptoms would all decline with the progress of abstinence and these would account for the improvement in emotion recognition and emotion differentiation among cannabis abstainers over time. It was also hypothesised that cannabis abstinence would, in itself, significantly contribute to better emotion recognition and differentiation in addition to improving anxiety, depression, stress, and withdrawal symptoms.

Methods

Participants

The required sample size for conducting a repeated-measures ANOVA was calculated using power analysis. The power analysis calculation using a power of .95, an alpha of .05, and an effect size of .20, the number of groups = 1, and the number of repeated measurements = 3, and correlations among repeated measures equalling .70 revealed a desired total sample size of 41. Therefore, a minimum sample size of about 60–70 was targeted for the recruitment of male participants in the age range of 18 to 60 years to accommodate for missing data or participant attrition across the three time points of assessment. Only male participants were targeted for recruitment, since as per the National Drug Dependence Treatment Center, AIIMS, New Delhi, the prevalence of cannabis use among men in India stands at 5.0% while among women, it stands at only 0.6% (Ambekar et al., 2019). Information on participants' educational attainment (in number of years), their age, and their socio-economic status (assessed using the modified B. G. Prasad socioeconomic scale 2022 for India; Sood et al., 2023) was collected.

Table 1. The Participants' Demographic and Cannabis Use-Related Information

Sample Characteristics (*N* = 70 males)		Range	M *(SD)*
Age (in Years)		18–58	27.39 (8.54)
Years of Education		7–24	13.50 (2.73)
SES in INR*		2666.67–150000	24270.23 (25188.30)
CAST score		7–21	12.60 (3.67)
Age of Onset of Cannabis Use		13–43	21.67 (6.43)
Cannabis (Marijuana) Use Quantity (in Grams)	In a typical session	0.13–5.00	1.54 (1.08)
	On a typical day	0.13–7.00	2.68 (1.72)
	In a typical week	0.25–30.00	11.36 (8.36)
		Frequency	
Form of Cannabis Use	Marijuana	100%	
Cannabis Use Frequency	Once a week	1.4%	
	3–4 times/week	2.9%	
	5–6 times/week	22.9%	
	Once a day	40.0%	
	More than once a day	32.9%	

Note. INR= Indian National Rupee; CAST= Cannabis Abuse Screening Test.
*All the participants belonged to middle, upper-middle, or upper class as per the modified B.G. Prasad classification for India [per capita income in the range 2460-4155 INR= middle class; in the range 4156-8396 INR= upper-middle class; per capita income ≥ 8397 INR= upper class].

Participants were excluded if they had any current or past diagnosis of a mental disorder, used any other drug (except cannabis), had any physical disease, impaired vision or hearing using a Medical Self-Report Form (created for this study) that the participants filled before their screening. Only participants scoring 7 or above on the Cannabis Abuse Screening Test (CAST) were included in the study. Since all the measures used were in English, only participants having a good proficiency of the English language were included.

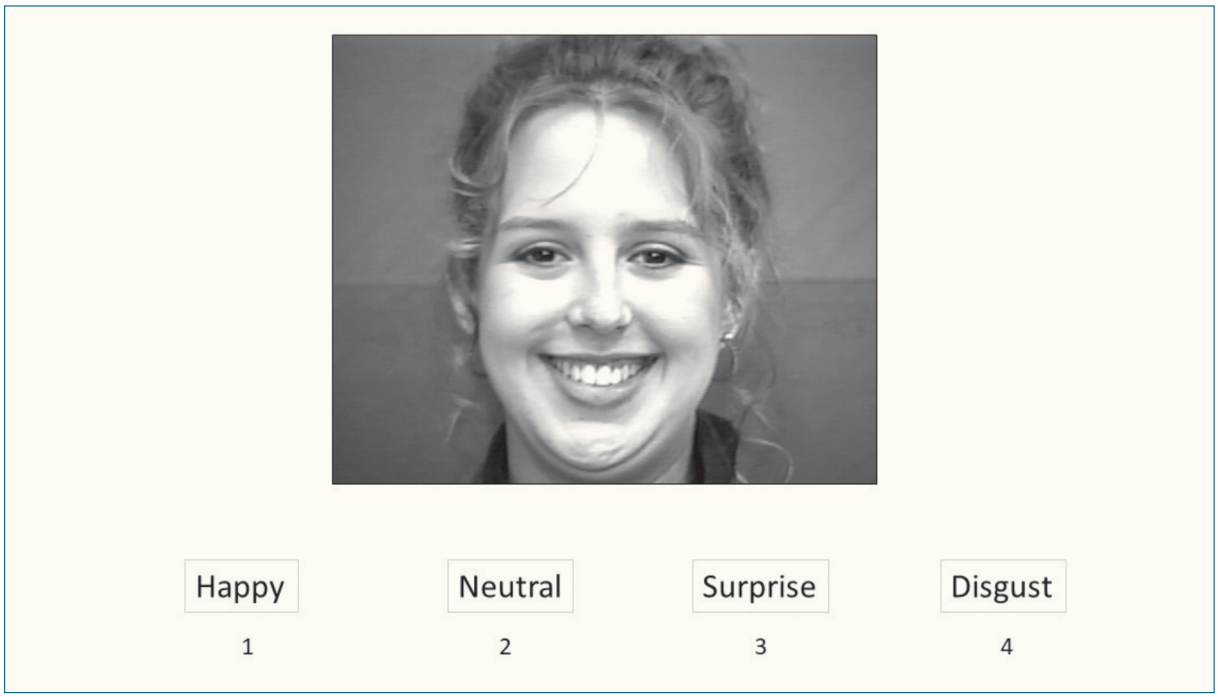
The final sample comprised 70 male participants. Initially, 72 participants consented to participating in the study. However, two participants left the Centre, and consequently the study, after two days and eight days of admission due to financial crisis and not being able to afford the treatment fee. These two participants' data from time T0 were discarded. Descriptive information on the sociodemographic and cannabis use characteristics of the participants is presented in Table 1.

Measures

Performance Measures

The Dynamic Visual Emotion Recognition Task. In the visual explicit emotion recognition task (based on Shukla et al., 2019); Figure 1, full-face videos displaying different emotions were presented in the upper centre of the computer screen with four response options (out of the six basic emotions of Happiness, Sadness, Fear, Anger, Surprise, and Disgust) given below. One of the labels was the correct response option denoting the emotion expressed in the facial video while the remaining three were distractor labels. The videos were developed using facial emotion photographs from the Cohn–Kanade AU-Coded Facial Expression Database (see Kanade et al., 2000; Lucey et al., 2010). There were altogether 24 trials (two male and two female faces displaying each of the six basic emotions). Accuracy and response time (RT) were calculated as indices of dynamic visual emotion recognition. Accuracy was quantified as percentage of completion, from 0 to 100%.

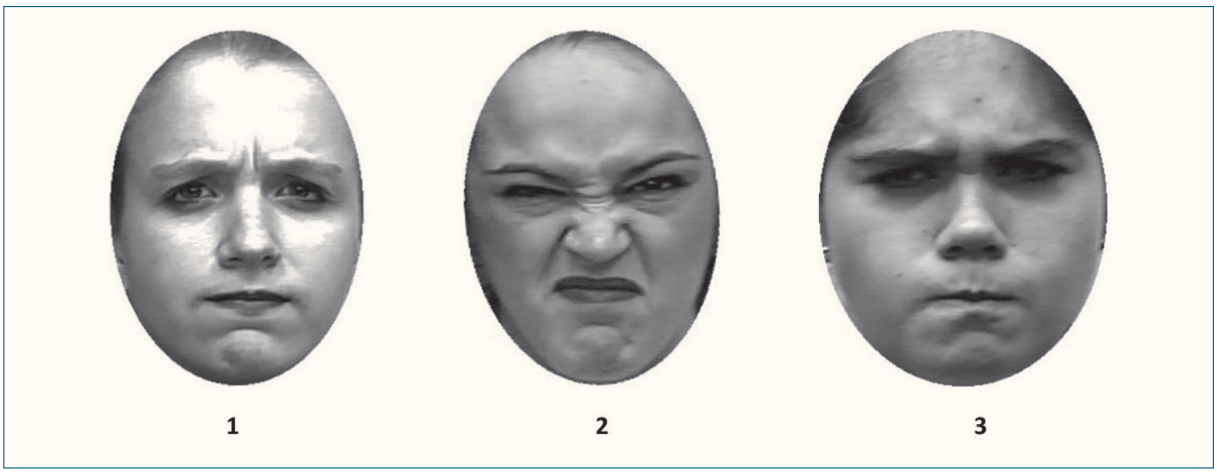
Figure 1. Diagrammatic Representation of the Dynamic Visual Emotion Recognition Task (Images © Jeffrey Cohn)



Note. Example photograph permitted for publication based on the database user agreement.

The Dynamic Visual Emotion Discrimination Task. In the dynamic visual emotion discrimination task, inspired by the "emotional odd-man-out" task developed by Herzmann et al. (2008), each target emotional face video (also developed using photographs from the Cohn–Kanade AU-Coded Facial Expression Database) was placed in a triad with two other facial videos displaying another expression with which it is commonly confused (e.g., a disgusted target face was paired with two angry distractor faces, see Figure 2, and participants were asked to indicate which face displayed the discrepant emotion by pressing the number (1, 2, or 3) corresponding to their response choice using the keyboard. This task presented 144 trials (24 trials: 12 male and 12 female faces; for each emotion category). Participants were given a five-minutes rest pause after 72 trials. The accuracy on the task formed the index of emotion discrimination or emotion differentiation (used interchangeably), which could range from 0–100%. RT was not used as a measure of emotion differentiation on this task as our pilot study on cannabis abstainers (N = 16) indicated ceiling effects (i.e., very low RTs ranging between 1.5–4 seconds) on this task, which did not show significant effects in any analysis. Thus, RT was not found to be a meaningful dependent measure for the present study.

Figure 2. Diagrammatic Representation of the Dynamic Visual Emotion Discrimination Task (Images © Jeffrey Cohn)



Note. Example photograph permitted for publication based on the database user agreement.

Self-Report Measures

The Cannabis Abuse Screening Test (CAST). The CAST, developed and validated by Legleye et al. (2007), identifies high risk of cannabis use. It has been validated using DSM-IV cannabis dependence and cannabis use disorders criteria, and has been widely used since. CAST consists of six questions related to the frequency, the degree of dependence, and the consequences of cannabis use. One question asks participants whether they have used cannabis in the last 12 months. If the response is affirmative, they are required to respond to six more questions reflecting back on their last 12 months, the responses to which range from 0 ("Never") to 4 ("Very often"). The overall score is obtained by adding up the scores on the six questions. The scores can range from 0 to 24. An overall score of 0–2 indicates low risk for cannabis abuse; a score of 3–6 indicates moderate risk of abuse; while an overall score of 7 or more is indicative of a high risk of cannabis abuse. Cronbach's alpha reliability of this scale on the present sample was $\alpha = .71$. In this study, CAST was only used to screen for high-risk cannabis users, thereby including those who were at high risk based on a score greater than 7.

The Cannabis Withdrawal Scale (CWS). The CWS (Allsop et al., 2011), comprising 19 items, was used to assess cannabis withdrawal intensity as well as the impact of cannabis withdrawal symptoms on normal daily functioning in the past 24 hours. This scale uses a 10-point Likert-type scale (ranging from 0 = "Not at all" to 10 = "Extremely") for assessing the intensity of the withdrawal symptoms. Respondents are also required to supply a number between 0–10 (using the same scale as for intensity) indicating the magnitude of negative effect that the withdrawal symptoms had on normal daily activities. Both for withdrawal intensity and the negative impact of withdrawal, the minimum and maximum obtainable scores are 0 and 190, respectively. In the present sample, the internal-consistency reliabilities (Cronbach's alpha) of withdrawal intensity at T1 and T2 were $\alpha = .83$ and $\alpha = .77$, respectively, and that of withdrawal impact were $\alpha = .92$ and $\alpha = .92$, respectively.

Daily Sessions, Frequency, Age of Onset, and Quantity of Cannabis Use Inventory (DFAQ-CU). The DFAQ-CU (Cuttler & Spradlin, 2017), among other things, measures average frequency of cannabis usage, the form in which cannabis is used, age of onset, etc. The 33 items/questions on this inventory are distributed across six factors: Daily Sessions Items (Items 20, 25), Frequency Items (Items 2, 3, 6, 7, 8, 9, 10, 11, 12), Age of Onset Items (Items 30, 31b, 31c, 32), Marijuana Quantity Items (Items 17, 18, 19), Concentrate Quantity Items (Items 22, 23, 24), and Edibles Quantity Item (Item 27). The Cronbach's alpha coefficients for the factors range from .69 (Daily Sessions) to .95 (Frequency). The factors have been reported to show convergent, predictive, and discriminant validity (Cuttler & Spradlin, 2017). Item 16 of DFAQ-CU asks participants the form of cannabis that they use regularly, with the options of None, Marijuana, Concentrates (e.g., Oil, Wax, Shatter, Butane Oil, Dabs), Edibles, and Other. Which items they answer next stands dependent upon their response to this item. Since all the participants used cannabis in the form of marijuana only, in addition to answering Items 1–16, they answered 17–21 (items 22–26 were to be answered in case of using Concentrates, and Item 27 was to be answered if one used Edibles) and then Items 28–32. Thus, data is not available for Concentrate Quantity Items (Items 22, 23, 24), and Edibles Quantity Item (Item 27). Cronbach's alphas for the Daily Sessions Items (Items 20, 25) factor could not be calculated as data for Item 25 was missing (which was to be answered only if participants used Concentrates). The internal consistency for the remaining three factors used in the study, i.e., Frequency Items, Age of Onset Items, and Marijuana Quantity Items, were found to be $\alpha = .70$, .76, and .85, respectively.

The Anxiety, Depression and Stress Scale (ADSS). The ADSS (Bhatnagar et al., 2011) contains 48 items assessing anxiety (19 items), depression (15 items), and stress (14 items). It measures seven factors: (1) Physical symptoms, (2) Apprehension, (3) Dryness of mouth (in the anxiety subscale) (4) Inertia-loss of interest and worth (5) Poor emotional control (in the depression subscale) (6) Emotional arousal, and (7) Negative life events (in stress subscale). However, for this study, we used only the total scores of anxiety, depression, and stress. Participants endorse each item as "Yes" (scored 1) or "No" (scored 0). The range of obtainable scores is 0–19 for anxiety, 0–15 for depression, and 0–14 for stress. This scale has a Cronbach's alpha reliability of 0.81 and a Spearman-Brown reliability of 0.89. It has item-total correlations of 0.60, 0.61, and 0.55, for anxiety, depression, and stress, respectively (Bhatnagar et al., 2011). In the present sample, the internal-consistency reliabilities of anxiety at T0, T1, and T2 were $\alpha = .66$, .78, and .86, respectively, that of depression were $\alpha = .84$, .75, and .85, respectively, and that of stress were $\alpha = .73$, .84, and .86, respectively.

Procedure

The Institutional Ethics Committee of Magadh University, Bodh Gaya, Bihar, India (Ref No.: Psy/19/23) approved this study's protocol and procedures. A within-group research design was used to test the hypotheses framed for the present study. To explore the said changes, participants (cannabis abstainers) were assessed at three time points: T0 = Within a few hours of admission to the drug rehabilitation centre (Hitaishi Happiness Home, Patna, Bihar) for rehabilitation and recovery; T1 = After 15 days of abstinence from cannabis while still admitted in the medical facility; and T2 = After 30 days of abstinence from cannabis while still admitted in the medical facility.

The drug rehabilitation centre from where the participants were recruited had a 30-day rehabilitation programme. This was because inpatient detoxification programmes for heavy cannabis users are recommended to last at least 21 days, since cannabis withdrawal syndrome itself lasts between 14–21 days (Bonnet et al., 2014; Bonnet et al., 2016; Budney et al., 2003 Budney & Hughes, 2006). The drug rehabilitation centre further kept the patients under observation for the next nine days, during which further counselling and discussions about life after discharge from the centre also took place, including relapse prevention and availability of help from the centre in such cases.

The time gap of 15 days between two successive assessments of the participants was chosen based on prior research recommendations. For instance, Nunnally & Bernstein (1994) advise that a gap of two weeks to a month should be maintained between the initial test and its subsequent retest to reduce the influence of memory recall. Research indicates that the ideal time span between tests may differ based on the specific construct being studied, its consistency over time, and the characteristics of the target population. However, a two-week interval is most -commonly recommended (Dutil et al., 2017; Streiner at al., 2014). Given these reasons, three equally spaced (15-day) assessments of the participants were planned.

Cannabis users admitting themselves to the drug rehabilitation centre and in the age range of 18–60 years were given an Information Sheet detailing the study on the day of their admission as well as a Medical Report Form (to screen for comorbidities and consumption of other drugs, such as alcohol) to fill and hand over/return should they be interested in participating in the study. This was done after the necessary formalities related to their admission to the rehabilitation centre were completed. It was ensured that the participants understood that denying participation would have no repercussions for them and they would be treated no differently than those admitted participants who consent to take part. If the participants agreed to participate, they were presented with an informed consent form and were requested to read and sign it. The CAST was administered to identify and select for participation those with high levels of cannabis use (score of ≥7). After admission to the said rehabilitation centre, cannabis users were helped to deal with their withdrawal symptoms through counselling and some analgesics and/or paracetamol to counter symptoms of pain and fever, without any other form of medication being administered. They were discharged from the centre after a month of staying there. Thus, the participants were administered the ADSS and the DFAQ-CU on the very first day of their admission into the facility to ascertain their current levels of anxiety, depression, and stress, as well as other relevant information related to their cannabis usage, respectively, before the withdrawal symptoms set in. Following this, both the performance-based measures, viz., The Dynamic Visual Emotion Discrimination Task, and The Dynamic Visual Emotion Recognition Task were administered. The sequence of presentation regarding the two tasks was reversed for half the participants. Before the actual task performance, the participants were given a short practice session on each of the tasks. Participants were allowed rest pauses of 5–15 minutes (as required by them) between tasks.

After a period of two weeks, during which they were on total abstinence from cannabis, the participants were again assessed using the ADSS and the two performance tasks, after being administered the CWS to assess the intensity of withdrawal symptoms and their impact on participants' daily-life activities. The same procedure was repeated again after a further period of two weeks, when the ADSS and the CWS as well as the performance-based measures were administered. After the third assessment, the participants were debriefed regarding the purpose of the study and thanked for their participation.

Statistical Analyses

Bivariate (Pearson's product-moment) correlations were calculated among the examined variables (frequency and quantity of cannabis use, age of onset of cannabis use; anxiety, depression, stress, emotion recognition, and emotion differentiation at T0, T1, and T2; with withdrawal intensity and withdrawal impact at T1 and T2). For comparing levels of anxiety, depression, stress, intensity and impact of withdrawal symptoms over time, as well as for the accuracy and RT on the two tasks, Repeated-Measures ANOVAs were conducted for each variable

separately followed by repeated contrast analyses to compare T0 with T1 and T1 with T2. In order to gauge the impact of abstinence from cannabis alone in the change in emotion recognition and differentiation from T0 to T1 and from T1 to T2, repeated-measures ANCOVAs were conducted separately, once with T0 and T1 and again with T1 and T2 scores of emotion recognition and differentiation. As covariates, the difference in scores of anxiety, depression, and stress from T0 to T1 were entered in the first analyses, and the difference scores of anxiety, depression, and stress from T1 to T2 were entered as covariates in the second analysis. Additionally, difference scores of withdrawal intensity and withdrawal impact from T1 to T2 (as withdrawal was measured only at T1 and T2 and not at T0: the time of admission to the rehabilitation facility) were also controlled for in the second analysis. Lastly, using repeated-measures ANCOVA (controlling for covariates as above), it was also explored how emotion recognition and differentiation varied across the time points for each of the six basic emotions. Repeated contrast analyses were used in ANOVA/ANCOVA analyses. The assumptions for all the statistical tests applied were checked for and found to be met.

Results

Results from the bivariate correlations revealed significant negative correlations of cannabis use frequency with accuracy of emotion recognition at T2 (r = -.32, p = .041) and a significant positive correlation with stress at T2 (r = .40, p = .010) (see Appendix Table 1). Quantity of cannabis use showed a significant relationship only with depression at T0 (r = .44, p = .005). Age of onset of cannabis use did not show any significant correlation with any outcome measure of psychological distress (anxiety, depression, and stress), withdrawal symptoms (intensity and impact), or scores on performance measures (accuracy and RT of emotion recognition and accuracy of emotion differentiation). For more correlations among the variables in this study, see Appendix Table 1.

Pearson's correlations of anxiety, depression, and stress were positive and significant in terms of emotion recognition and emotion differentiation at different time-points (see Appendix Table 1). Since this was contrary to expectations, quadratic associations of the said variables were also explored and found to be significant for the same pairs of variables for which linear associations were held.

Results of the repeated-measures ANOVA to explore differences in emotion recognition across the three time-points (T0, T1, T2) revealed a significant effect of time-since-abstinence on the accuracy of emotion recognition, F (2, 136) = 19.48, p < .001, η_p^2 = .225, such that the mean accuracy of emotion recognition increased significantly from T0 to T1 (p < .001) and from T1 to T2 (p = .008; see Table 2 for means). These differences across time were not significant for the time taken (RT) in the correct recognition of emotions, F (2, 136) = 2.91, p = .058, η_p^2 = .043. Similar abstinence-duration-related improvements as for emotion recognition were observed in emotion discrimination among cannabis abstainers, F (2, 136) = 32.43, p < .001, η_p^2 = .333, from T0 to T1 (p = .002) and T1 to T2 (p < .001) (see Table 2 for means).

Table 2. Participants' Mean Scores on Performance and Self-Report Measures Across the Three Time Points

		Cannabis abstinence duration		
		M *(SD)*		
Variable	Parameter	T0	T1	T2
Emotion Recognition	Accuracy[a]	31.96 (11.17)	39.95 (19.80)	45.65 (21.88)
	Response time[b]	8.80 (8.19)	4.41 (3.74)	5.10 (4.76)
Emotion Discrimination	Accuracy[a]	65.25 (19.37)	71.82 (15.33)	81.13 (11.11)
Mental Health Problems	Anxiety	8.97 (3.27)	7.97 (3.84)	3.00 (3.58)
	Depression	11.57 (3.37)	11.36 (2.89)	3.51 (3.48)
	Stress	10.56 (2.76)	10.44 (3.34)	4.13 (3.68)
Cannabis Withdrawal	Withdrawal intensity	–	4.21 (1.04)	1.27 (0.94)
	Withdrawal impact	–	3.14 (0.94)	0.82 (0.80)

Note. T0 = 0 days into abstinence; T1 = 15 days into abstinence; T2 = 30 days into abstinence.
[a] In percentage. [b] In seconds.

Repeated-measures ANOVA exploring the differences in self-reported anxiety across the three time-points revealed a significant effect of time-since-abstinence on anxiety, F (2, 138) = 102.79, p < .001, η_p^2 = .598, such that the mean anxiety scores decreased significantly from T0 to T1 (p = .014) and from T1 to T2 (p < .001; see Table 2 for means). This pattern, however, did not hold for levels of depression, F (2, 138) = 186.08, p < .001, η_p^2 = .729; and stress, F (2, 138) = 131.04, p < .001, η_p^2 = .655), where significant decline was noted from T1 to T2 only (both ps < .001) and not from T0 to T1 (p = .579 and .735, respectively).

In order to understand the contribution of abstinence from cannabis to improving emotion recognition and discrimination, two separate repeated-measures ANCOVAs were conducted considering two time-points at a time (T0 & T1 and T1 & T2) and controlling for the difference in anxiety, depression, and stress from T0 to T1, as well as for the difference in anxiety, depression, stress, withdrawal intensity, and withdrawal impact from T1 to T2 (see Table 3). From T0 to T1, findings revealed that even after controlling for the change in anxiety, depression, and stress (even though this decline was not significant for depression and stress), a significant improvement in visual emotion recognition occurred, F (1, 64) = 18.75, p < .001, η_p^2 = .227. However, from T1 to T2, findings indicated that after controlling for the difference in anxiety, depression, stress, and withdrawal intensity and impact, the difference between the accuracy of emotion recognition from T1 to T2 turned non-significant, F (1, 62) = 2.24, p = .140, η_p^2 = .035. It was observed that stress, and withdrawal intensity and impact did not affect the change in emotion recognition significantly, p = .605, .097, and .117, respectively, and the decline in anxiety and depression (p = .025 and p = .002, respectively) primarily accounted for the improvement in visual emotion recognition from T1 to T2.

Table 3. Results of Repeated-Measures ANCOVA for the Accuracy of Emotion Recognition and Emotion Differentiation After Controlling for the Change in Anxiety, Depression, Stress, Withdrawal Intensity and Withdrawal Impact

	Accuracy of Emotion Recognition					
	T0 to T1			T1 to T2		
Variables	F (1, 64)	p	η_p^2	F (1, 62)	p	η_p^2
Time	18.75	**<.001**	.227	2.24[a]	.140	.035
Anxiety	14.40	**<.001**	.184	5.25	**.025**	.079
Depression	.91	.344	.014	10.69	**.002**	.149
Stress	.16	.688	.003	.21	.605	.003
Withdrawal Intensity	–	–	–	2.84	.097	.045
Withdrawal Impact	–	–	–	2.53	.117	.040
	Accuracy of Emotion Differentiation					
	T0 to T1			T1 to T2		
Variables	F (1, 64)	p	η_p^2	F (1, 59)	p	η_p^2
Time	8.98	**.004**	.126	.82[b]	.369	.014
Anxiety	5.72	**.020**	.084	2.48	.121	.040
Depression	.03	.861	<.001	1.83	.181	.030
Stress	1.16	.286	.018	.05	.818	.001
Withdrawal Intensity	–	–	–	.00	.962	<.001
Withdrawal Impact	–	–	–	.62	.436	.010

Note. T0 = 0 days into abstinence; T1 = 15 days into abstinence; T2 = 30 days into abstinence.
Values in BOLD are statistically significant.
[a] Significant [F (1, 67) = 7.53, p = .008] before controlling for covariates.
[b] Significant [F (1, 65) = 35.04, p < .001] before controlling for covariates.

Similar analyses for emotion differentiation revealed that from T0 to T1, increase in emotion recognition accuracy occurred above and beyond the effect of decrease in anxiety, depression, and stress levels from T0 to T1, F (1, 64) = 8.98, p =.004, η_p^2 = .126, of which it was only the decline in anxiety that significantly affected the improvement in emotion differentiation, p = .020 (see Table 3). From T1 to T2, however, the improvement in emotion differentiation was not due to abstinence, F (1, 59) = .82, p = .369, η_p^2 = .014, and was accounted for by the combined effect of change in anxiety, depression, stress, withdrawal intensity, and withdrawal impact.

Emotion-wise analyses showed that the best recognised emotions were happiness and anger and the most poorly recognised ones were sadness, surprise, and fear at all the time points (see Table 4 for means). The recognition of fear and disgust increased significantly with increase in abstinence duration from T0 to T1, while for surprise and sadness, it increased consistently over time; i.e., from T0 to T1 and then from T1 to T2. Increases in recognising other emotions over time were not significant (see Table 4).

With respect to emotion differentiation, the best accuracy of differentiation was noted for surprise, followed by happiness and fear (see Table 4 for means). The poorest discrimination was observed for anger and disgust for all the time points of assessment (Table 4). With increase in abstinence, the differentiation accuracy for happiness, sadness, surprise, and disgust increased significantly from T0 to T1, but not from T1 to T2. Increases in differentiating other emotions over time were not significant (see Table 4).

Table 4. Results of Repeated-Measures ANOVA Comparing Emotion-Wise Mean Emotion Recognition and Emotion Differentiation Scores Across the Three Time Points

	Accuracy of Emotion Recognition			Comparison of Mean Difference Across Successive Time-Points							
Emotions	T0 Mean *(SD)*	T1 Mean *(SD)*	T2 Mean *(SD)*	T0-T1	F (1,64)	*p*	η_p^2	T1-T2	F (1,64)	*p*	η_p^2
Happiness	55.36 (19.92)	59.56 (28.66)	65.00 (23.85)	-4.20	3.16	.080	.047	-5.44	1.12	.295	.018
Sadness	9.64 (8.70)	19.48 (19.24)	25.36 (15.22)	-9.84	9.69	**.003**	.132	-5.88	4.74	**.033**	.072
Fear	26.07 (17.77)	34.19 (22.40)	36.43 (23.96)	-8.12	5.81	**.019**	.083	-2.24	0.26	.609	.004
Anger	47.50 (31.61)	51.83 (34.37)	64.64 (31.42)	-4.33	1.32	.255	.020	-12.81	0.02	.890	<.001
Surprise	21.07 (18.37)	33.82 (32.26)	40.71 (38.35)	-12.75	16.16	**<.001**	.202	-6.89	6.20	**.016**	.092
Disgust	32.14 (19.10)	40.81 (20.22)	41.78 (19.84)	-8.67	9.13	**.004**	.125	-0.97	0.82	.369	.013
	Accuracy of Emotion Differentiation			Comparison of Mean Difference Across Successive Time-Points							
Emotions	T0 Mean *(SD)*	T1 Mean *(SD)*	T2 Mean *(SD)*	T0-T1	F (1,63)	*p*	η_p^2	T1-T2	F (1,63)	*p*	η_p^2
Happiness	69.40 (21.85)	76.37 (18.81)	86.07 (9.83)	-6.97	7.32	**.009**	.104	-9.70	0.38	.541	.006
Sadness	63.15 (22.51)	68.53 (22.19)	80.53 (17.11)	-5.38	6.45	**.014**	.093	-12.00	2.07	.156	.033
Fear	70.48 (23.45)	75.62 (19.63)	87.08 (13.18)	-5.14	3.44	.068	.052	-11.46	0.54	.467	.009
Anger	57.92 (18.72)	61.99 (17.49)	70.71 (15.64)	-4.07	3.42	.069	.052	-8.72	0.15	.701	.003
Surprise	73.75 (22.26)	81.72 (16.43)	90.42 (11.58)	-7.97	8.41	**.005**	.118	-8.70	0.24	.624	.004
Disgust	56.78 (17.12)	61.94 (18.16)	71.96 (11.93)	-5.16	6.68	**.012**	.096	-10.02	0.03	.873	<.001

Note. T0 = 0 days into abstinence; T1 = 15 days into abstinence; T2 = 30 days into abstinence.
The accuracy of emotion recognition for each emotion category has been calculated according to the formula= [(No. of trials of that emotion correctly identified/4) x 100], since there were altogether four trials (2 male and 2 female faces) for each emotion. A similar method was used for calculating the accuracy of emotion differentiation for each emotion category; i.e., (Total no. of correctly differentiated trials for that emotion/ 24) x 100.
Values in BOLD are statistically significant.

Discussion

The present study aimed to explore how visual emotion recognition and emotion discrimination change with the increase in the number of days into cannabis abstinence and how far this change has accounted for a variation in levels of self-reported anxiety, depression, and stress over time, as well as the withdrawal symptoms' intensity and impact. Heavy cannabis users admitting themselves to a rehabilitation facility to receive therapeutic help in giving up cannabis addiction were followed for one month of their stay in the facility. They were tested at three time points: T0 (at the time of admission), T1 (on the 15th day of their stay), and T2 (on the 30th day of their stay) for the levels of anxiety, depression, and stress, as well as for their performance on computerised tasks of emotion recognition and discrimination. At T1 and T2, the intensity and impact of withdrawal symptoms were also assessed. This is the first study, to the best of our knowledge, that explored the relative contribution of abstinence from cannabis and the decline in psychological distress and withdrawal symptoms to the improvement in emotion recognition and discrimination. Unlike most previous studies, this study employed more ecologically valid stimuli by presenting participants with facial emotion videos for emotion recognition rather than static faces.

The prominent finding emerging from the study was that while abstinence from cannabis has its beneficial effects in improving emotion recognition and discrimination over and above the effects of decline in psychological distress in the first two weeks of abstinence, further enhancement in emotion recognition and discrimination in the following two weeks proceeds through a decline in psychological distress and intensity and impact of withdrawal symptoms. Our findings that both emotion recognition and emotion differentiation show improvement after 15 days of cannabis abstinence, even after accounting for the role of decline in depression, anxiety, and stress, constitutes a new finding that previous research has not reported.

Overall, anxiety declined significantly from T0 to T1 and from T1 to T2, but a significant decline in depression and stress was noted only from T1 to T2. Since anxiety scores could vary between 0–19, a mean score of approx. 9 at T0 could be considered a moderately high level of anxiety, which subsequently declined to 3 at T2, indicating a low level of anxiety. Depression scores could range between 0–15 and a score of approx. 12 denoted high levels of depression at T0, which declined to 3.5 at T2, indicating a low level of depression. Similarly, stress (where scores could range between 0–14) was high at T0 with a mean of 10.6, but reduced to low stress at T2.

Our findings resonate with those of a recent study conducted on adolescent cannabis users, who reported significant successive weekly declines in their anxiety and depression throughout the assessment period of four weeks (Cooke et al., 2021). A similar decline in depressive symptoms was noted after three weeks of cannabis abstinence in another study as well (Jacobus et al., 2017).

In this study, participants demonstrated a very poor accuracy of emotion recognition at T0 (approx. 32%), which gradually increased over time (T1: approx. 40%; T2: approaching 46%). This recognition rate was much less than that obtained by Bayrakçı et al. (2015) at 3.2 months of abstinence; i.e., 61.1%. Given the steady rise in emotion recognition every fortnight (although the increase from T1 to T2 was not significant after controlling for the change in mental health problems and withdrawal symptoms), it is possible that this percentage might reach a level similar to that obtained by Bayrakçı et al. The accuracy of emotion differentiation stood much better than that of emotion recognition, being approx. 65% at T0. Emotion differentiation revealed a significant change over time from T0 to T1, but not from T1 to T2 – when controlled for the change in mental health problems and withdrawal symptoms. Results regarding the accuracy of emotion differentiation are quite similar (81.1% at T2) to the ones reported by Bayrakçı et al. (2015), which came to 81.3% at 3.2 months of abstinence. Overall, despite improvements in emotion recognition and emotion differentiation with an increase in the duration of abstinence, such improvements may still be significantly worse than those for healthy controls, as Bayrakçı et al. (2015) observed.

Improvements in emotion recognition and differentiation were seen from T0 to T1, even after controlling for mental health problems, although the decline in depression and stress from T0 to T1 was not significant. This finding lines up with the results of a systematic review and meta-analysis by Scott and colleagues (2018) who identified that cognitive deficits associated with the use of cannabis diminish with a longer duration of abstinence (more specifically, >72 hours). Thus, in combination with the findings of Scott et al. (2018), our findings suggest that the cognitive and emotional deficits associated with cannabis use may not be persistent and tend to diminish with an increase in the length of cannabis abstinence. Withdrawal symptoms (including anxiety) typically appear within 1–3 days of not consuming cannabis, peaking between days 2–6, and mostly lasting between 4–14 days (Budney et al., 2008).

The current study's findings indicating that emotion processing improves over time with cannabis abstinence are comparable with the broader literature on substance use disorders, particularly those involving alcohol use disorder (AUD). Even early abstinent AUD patients continue to struggle with emotion recognition, often misinterpreting neutral faces as having emotional content (Kornreich et al., 2013; Kornreich et al., 2016; Philippot et al., 1999), although recognition of happiness tends to remain relatively intact (Bora & Zorlu, 2017), as noted in our study, too. In comparison, the current study on cannabis users reveals a more optimistic abstinence trajectory, indicating improvements in emotion recognition and differentiation over time. This suggests that, unlike AUD where emotional processing deficits may persist even in abstinence, cannabis-related deficits in emotion processing may be more reversible with sustained abstinence. It is important to note here that in previous studies (Kornreich et al., 2013; Kornreich et al., 2016), abstinent AUD patients were recruited in their third or fourth week of alcohol detoxification. Compared to these participants, our sample of cannabis abstainers started demonstrating improved emotion recognition and differentiation early on. These findings contribute to a nuanced understanding of how different substances impact emotional processing and recovery, highlighting that while both alcohol and cannabis use disorders impair emotional recognition, the potential for recovery in emotional processing abilities might be more pronounced in abstinent cannabis users. Furthermore, the decline in anxiety, depression, and stress over time in this present study is likely to result not only from the progressing detoxification of the body due to cannabis abstinence but also from the medical and therapeutic support and counselling available at the centre.

Findings pertaining to specific emotion categories stand also partly in line with previously reported findings. For instance, our study shows that positive emotions (happiness and surprise) are best recognised and differentiated while negative emotions (anger and disgust) are the worst recognised. This lies somewhat in line with the findings related to other substance use disorders, where a previous meta-analytic study (Bora & Zorlu, 2017) reports that the recognition of happiness tends to remain relatively intact in recent AUD abstainers. Bayrakçı et al. (2015) reported similar findings regarding a better recognition of positive emotions and poorer recognition of negative emotions in cannabis abstainers over a one-month duration. However, our findings show that the negative emotion of fear is also better recognised (similar to happiness), a finding that runs in contrast to that reported by Bayrakçı et al. (2015). The present results concerning emotion differentiation add to the literature as no previous study, to our knowledge, has comparatively explored emotion differentiation across the six emotion categories among cannabis abstainers. It is surprising, though, that the emotion of surprise that remained one of the worst recognised was one of the best differentiated (along with happiness and fear) from other emotions. The emotion of happiness was both best recognised and one of the best differentiated (along with surprise). Further, previous studies have shown that THC, the main psychoactive component in cannabis, when administered acutely blunts amygdala activity, particularly pertaining to negative as opposed to positive emotions (Ballard et al., 2012; Phan et al., 2008). This suggests that discontinuing cannabis consumption would improve emotion recognition as observed in the present study. Despite the improvement in emotion recognition over time, however, negative emotions were still less accurately identified than were positive emotions, probably because of the more damaging effect earlier cannabis use had on the recognition of negative emotions.

It should be noted that the cross-sectional correlations between mental health problems and emotion-processing were somewhat inconsistent with the findings discussed above. Anxiety and stress at the three time points correlated positively with emotion recognition at the respective time points. These symptoms also revealed a significant and positive correlation with emotion differentiation at T1, whereas depression correlated positively with emotion recognition at T2. These findings (particularly for anxiety and stress) stand at odds with those identified using ANCOVAs. A possible reason for these counterintuitive findings may be that apart from their linear relationship being significant, their quadratic relationship was also significant, suggesting a U-shaped relationship between emotion recognition/differentiation and anxiety, depression, or stress. Thus, it is likely that very low or very high levels of mental health problems are associated with poorer emotion-processing during cannabis abstinence, while optimal levels are associated with better emotion recognition and differentiation. However, an in-depth exploration of the possible reasons is beyond the scope of this discussion.

Strengths and Limitations

The present study extends and adds to the limited literature on the emotional impacts of cannabis abstinence. Its research highlights that an enhanced ability to recognize and distinguish emotions is associated with a reduction in psychological distress and complete cessation of cannabis use during the initial two weeks of abstinence, which improves gradually as time passes. This progress in emotion recognition and discrimination is evident across all

six basic emotions with an increasing duration of abstinence. However, certain limitations of the study need to be realised. First, the sample size was moderate. Even though the research met the minimum sample size requirement suggested by a priori sample size calculations, a larger sample would have allowed for subgroup analyses with respect to demographic variables regarding age, education, SES, etc. Second, the findings remain limited by the fact that they are based on men participants only and cannot be generalised to women, especially since the latest studies (e.g., Sullivan et al., 2022) show sex differences in the impact of cannabis on emotion processing, and therefore the effect of abstinence from cannabis may also be sex-specific. Third, we assessed participants at three time points only, because of which an earlier estimate of the withdrawal symptoms' intensity and impact was not available until day 15 of the abstinence. Fourth, the internal consistency of anxiety (subscale of ADSS) at T0 was below the recommended cut-off of 0.70. The same was true for the Frequency items factor of CAST. This low level of reliability warrants careful interpretation for the related findings. Fifth, the use of self-report measures to screen for a current or past diagnosis of mental health disorder could not have been more accurate than a clinical interview or diagnosis by a trained clinician would have been. Future research should aim to employ the latter, more valid, measures to screen participants for mental health problems. Sixth, the research did not follow up on the participants after discharge and no further assessments were done after they left the rehabilitation center, which, had it been done, could have yielded further insights. It is recommended that future researchers undertake follow-ups (preferably, more than one) to better gauge any changes in emotion recognition and differentiation as well as other indices of mental health that may impact such emotional processing. Seventh, a cannabis non-user control group could have better controlled for and perhaps eliminated the possible learning effect on the emotion processing tasks that may have occurred over time. Finally, a causal relationship between emotion recognition/discrimination and psychological distress/withdrawal symptoms cannot be ascertained due to the study's design. Therefore, future research should also explore whether an improvement in emotion recognition and discrimination impacts or predicts a decline in psychological distress.

Conclusion, Implications, and Future Directions

In conclusion, improved emotion recognition and differentiation proceeds through the decline in psychological distress and zero cannabis usage for the first two weeks of abstinence, while for the next two weeks these improvements proceed through further declines in psychological distress and withdrawal symptoms. Happiness stood as the best recognised and well-differentiated emotion. The worst recognised emotions of sadness and fear evinced significant increases in recognition accuracy within the first 15 days of cannabis abstinence while another of the poorly-recognised emotions, namely surprise demonstrated significant increases in recognition accuracy with the increase in cannabis abstinence at every successive time-point; i.e., after the first 15 days of abstinence, and then further increases after the second 15-day abstinence period. Surprise was also the best differentiated emotion, followed closely by happiness and fear.

This study underscores the potential benefits of cannabis abstinence on emotional well-being, emphasizing its positive impact on emotion recognition and discrimination. This insight could be valuable in the development of targeted interventions within cannabis rehabilitation programs. The findings suggest that improvements in emotion recognition extend beyond mere abstinence, emphasizing the importance of addressing psychological distress and withdrawal symptoms in the rehabilitation process. Treatment strategies should focus on holistic well-being rather than solely relying on abstinence. The findings further imply that the enhanced ability to recognize and differentiate emotions may serve as an indicator of progress during the rehabilitation period. Incorporating regular assessments of emotion recognition skills may offer a dynamic measure of recovery and guide treatment adjustments. Further, the finding of continued improvements involving cannabis abstinence in emotion recognition and differentiation suggests implications for improved socio-emotional processing and healthy interpersonal relationships, since the accurate recognition of others' emotions would facilitate better emotional responses. This would help in initiating and sustaining more meaningful interpersonal interactions, possibly breaking the cycle of addiction (which is mostly seen as an escape from stress and loneliness) and fostering sustained abstinence from cannabis. It would also help prevent later relapse and lead to further improvements in emotion recognition.

Future research could delve into demographic variables like age, education, and socioeconomic status to understand potential variations in emotional outcomes during cannabis abstinence. This could contribute to more personalized treatment approaches. Longitudinal studies extending beyond one month could provide a more comprehensive understanding of the prolonged emotional impact of cannabis abstinence. This could include

assessing emotional changes over an extended period to capture sustained improvements. Longitudinal studies could also assess whether emotion recognition impairments persist in cannabis abstainers compared to active cannabis users and non-users. Future research should include female participants. This would contribute to a more comprehensive understanding of how cannabis abstinence affects emotion processing across sexes. To address the limitation of the withdrawal symptoms' delayed assessment, future studies could incorporate earlier evaluations. This would allow for a more nuanced understanding of the temporal dynamics of withdrawal symptoms and their correlation with emotional changes. Lastly, further research is required on the relationship between mental health and emotion processing during cannabis abstinence to better understand their association.

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No conflict of interest has been declared by the authors.

Ethical statement
This manuscript is the authors' original work.
All participants engaged in the research voluntarily and anonymously.
Their data are stored in coded materials and databases without personal data.
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References

Allsop, D. J., Norberg, M. M., Copeland, J., Fu, S., & Budney, A. J. (2011). The Cannabis Withdrawal Scale development: Patterns and predictors of cannabis withdrawal and distress. *Drug and Alcohol Dependence*, *119*(1–2), 123–129. https://doi.org/10.1016/j.drugalcdep.2011.06.003

Ambekar, A., Agrawal, A., Rao, R., Mishra, A. K., Khandelwal, S. K., Chadda, R. K., on behalf of the group of investigators for the National Survey on Extent and Pattern of Substance Use in India (2019). *Magnitude of substance use in India*. New Delhi: Ministry of Social Justice and Empowerment, Government of India. https://www.lgbrimh.gov.in/resources/Addiction_Medicine/elibrary/magnitude_substance_abuse_india.pdf

Ballard, M. E., Bedi, G., & de Wit, H. (2012). Effects of delta-9-tetrahydrocannabinol on evaluation of emotional images. *Journal of Psychopharmacology*, *26*(10), 1289–1298. https://doi.org/10.1177/0269881112446530

Bayrakçı, A., Sert, E., Zorlu, N., Erol, A., Sarıçiçek, A., & Mete, L. (2015). Facial emotion recognition deficits in abstinent cannabis dependent patients. *Comprehensive Psychiatry*, *58*, 160–164. https://doi.org/10.1016/j.comppsych.2014.11.008

Bhatnagar, P., Singh, M., Pandey, M., & Sandhya, A. (2011). *Manual for anxiety, depression and stress scale*. National Psychological Corporation.

Bonnet, U., Specka, M., & Scherbaum, N. (2016). Häufiger Konsum von nicht-medizinischem Cannabis: Gesundheitliche Folgen und Wirkung der Entzugbehandlung [Frequent non-medical cannabis use: Health sequelae and effectiveness of detoxification treatment]. *Deutsche Medizinische Wochenschrift*, *141*(2), 126–131. https://doi.org/10.1055/s-0041-106313

Bonnet, U., Specka, M., Stratmann, U., Ochwadt, R., & Scherbaum, N. (2014). Abstinence phenomena of chronic cannabis-addicts prospectively monitored during controlled inpatient detoxification: Cannabis withdrawal syndrome and its correlation with delta-9-tetrahydrocannabinol and-metabolites in serum. *Drug and Alcohol Dependence*, *143*, 189–197. https://doi.org/10.1016/j.drugalcdep.2014.07.027

Bora, E., & Zorlu, N. (2017). Social cognition in alcohol use disorder: A meta-analysis. *Addiction*, *112*(1), 40-48. https://doi.org/10.1111/add.13486

Bossong, M. G., van Hell, H. H., Jager, G., Kahn, R. S., Ramsey, N. F., & Jansma, J. M. (2013). The endocannabinoid system and emotional processing: A pharmacological fMRI study with Δ9-tetrahydrocannabinol. *European Neuropsychopharmacology*, *23*(12), 1687–1697. https://doi.org/10.1016/j.euroneuro.2013.06.009

Botsford, S. L., Yang, S., & George, T. P. (2020). Cannabis and cannabinoids in mood and anxiety disorders: Impact on illness onset and course, and assessment of therapeutic potential. *The American Journal on Addictions*, *29*(1), 9–26. https://doi.org/10.1111/ajad.12963

Bourke, C., Douglas, K., & Porter, R. (2010). Processing of facial emotion expression in major depression: A review. *Australian & New Zealand Journal of Psychiatry*, *44*(8), 681–696. https://doi.org/10.3109/00048674.2010.496359

Budney, A. J., & Hughes, J. R. (2006). The cannabis withdrawal syndrome. *Current Opinion in Psychiatry*, *19*(3), 233–238. https://doi.org/10.1097/01.yco.0000218592.00689.e5

Budney, A. J., Moore, B. A., Vandrey, R. G., & Hughes, J. R. (2003). The time course and significance of cannabis withdrawal. *Journal of Abnormal Psychology*, *112*(3), 393–402. https://doi.org/10.1037/0021-843X.112.3.393

Budney, A. J., Vandrey, R. G., Hughes, J. R., Thostenson, J. D., & Bursac, Z. (2008). Comparison of cannabis and tobacco withdrawal: Severity and contribution to relapse. *Journal of Substance Abuse Treatment*, *35*(4), 362–368. https://doi.org/10.1016/j.jsat.2008.01.002

Castellano, F., Bartoli, F., Crocamo, C., Gamba, G., Tremolada, M., Santambrogio, J., Clerici, M., & Carrà, G. (2015). Facial emotion recognition in alcohol and substance use disorders: A meta-analysis. *Neuroscience & Biobehavioral Reviews*, *59*, 147–154. https://doi.org/10.1016/j.neubiorev.2015.11.001

Cohn, J. F., & Schmidt, K. L. (2004). The timing of facial motion in posed and spontaneous smiles. *International Journal of Wavelets, Multiresolution and Information Processing*, *2*(2), 121–132. https://doi.org/10.1142/S021969130400041X

Connor, J. P., Stjepanović, D., Le Foll, B., Hoch, E., Budney, A. J., & Hall, W. D. (2021). Cannabis use and cannabis use disorder. *Nature Reviews Disease Primers*, *7*, 16. https://doi.org/10.1038/s41572-021-00247-4

Cooke, M. E., Gilman, J. M., Lamberth, E., Rychik, N., Tervo-Clemmens, B., Evins, A. E., & Schuster, R. M. (2021). Assessing changes in symptoms of depression and anxiety during four weeks of cannabis abstinence among adolescents. *Frontiers in Psychiatry*, *12*, Article 689957. https://doi.org/10.3389/fpsyt.2021.689957

Cousijn, J., & van Duijvenvoorde, A. C. K. (2018). Cognitive and mental health predictors of withdrawal severity during an active attempt to cut down cannabis use. *Frontiers in Psychiatry*, *9*, Article 301. https://doi.org/10.3389/fpsyt.2018.00301

Cservenka, A., & Donahue, L. C. (2024). Emotion recognition and self-reported emotion processing in alcohol and cannabis co-using young adults. *Behavioral Sciences*, *14*(5), Article 407. https://doi.org/10.3390/bs14050407

Cuttler, C., & Spradlin, A. (2017). Measuring cannabis consumption: Psychometric properties of the Daily Sessions, Frequency, Age of Onset, and Quantity of Cannabis Use Inventory (DFAQ-CU). *PLoS One*, *12*(5), Article e0178194. https://doi.org/10.1371/journal.pone.0178194

Dalili, M. N., Penton-Voak, I. S., Harmer, C. J., & Munafò, M. R. (2015). Meta-analysis of emotion recognition deficits in major depressive disorder. *Psychological Medicine*, *45*(6), 1135–1144. https://doi.org/10.1017/S0033291714002591

Degenhardt, L., Whiteford, H. A., Ferrari, A. J., Baxter, A. J., Charlson, F. J., Hall, W. D., Freedman, G., Burstein, R., Johns, N., Engell, R. E., Flaxman, A., Murray, C. J., & Vos, T. (2013). Global burden of disease attributable to illicit drug use and dependence: Findings from the Global Burden of Disease Study 2010. *The Lancet*, *382*(9904), 1564–1574. https://doi.org/10.1016/S0140-6736(13)61530-5

Demenescu, L. R., Kortekaas, R., den Boer, J. A., & Aleman, A. (2010). Impaired attribution of emotion to facial expressions in anxiety and major depression. *PLoS One*, *5*(12), Article e15058. https://doi.org/10.1371/journal.pone.0015058

D'Hondt, F., Campanella, S., Kornreich, C., Philippot, P., & Maurage, P. (2014). Below and beyond the recognition of emotional facial expressions in alcohol dependence: From basic perception to social cognition. *Neuropsychiatric Disease and Treatment*, *10*, 2177–2182. https://doi.org/10.2147/NDT.S74963

Dobs, K., Bülthoff, I., & Schultz, J. (2018). Use and usefulness of dynamic face stimuli for face perception studies—A review of behavioral findings and methodology. *Frontiers in Psychology*, *9*, 1355. https://doi.org/10.3389/fpsyg.2018.01355

Donadon, M. F., & de Lima Osorio, F. (2014). Recognition of facial expressions by alcoholic patients: A systematic literature review. *Neuropsychiatric Disease and Treatment*, 1655–1663. https://doi.org/10.2147/NDT.S65376

Dutil, É., Bottari, C., & Auger, C. (2017). Test-retest reliability of a measure of independence in everyday activities: The ADL profile. *Occupational Therapy International*, *2017*(1), Article 3014579. https://doi.org/10.1155/2017/3014579

Dyer, M. L., Attwood, A. S., Penton-Voak, I. S., & Munafò, M. R. (2022). The role of state and trait anxiety in the processing of facial expressions of emotion. *Royal Society Open Science*, *9*(1), Article 210056. https://doi.org/10.1098/rsos.210056

Easter, J., McClure, E. B., Monk, C. S., Dhanani, M., Hodgdon, H., Leibenluft, E., Charney, D.S., Pine, D.S., & Ernst, M. (2005). Emotion recognition deficits in pediatric anxiety disorders: Implications for amygdala research. *Journal of Child & Adolescent Psychopharmacology*, *15*(4), 563–570. https://doi.org/10.1089/cap.2005.15.563

Erol, A., Akyalcin Kirdok, A., Zorlu, N., Polat, S., & Mete, L. (2017). Empathy, and its relationship with cognitive and emotional functions in alcohol dependency. *Nordic Journal of Psychiatry*, *71*(3), 205–209. https://doi.org/10.1080/08039488.2016.1263683

Gobbi, G., Atkin, T., Zytynski, T., Wang, S., Askari, S., Boruff, J., Ware, M., Marmorstein, N., Cipriani, A., Dendukuri, N., & Mayo, N. (2019). Association of cannabis use in adolescence and risk of depression, anxiety, and suicidality in young adulthood: A systematic review and meta-analysis. *JAMA Psychiatry*, *76*(4), 426-434. https://doi.org/10.1001/jamapsychiatry.2018.4500

Gorfinkel, L. R., Stohl, M., & Hasin, D. (2020). Association of depression with past-month cannabis use among us adults aged 20 to 59 years, 2005 to 2016. *JAMA Network Open*, *3*(8), Article e2013802. https://doi.org/10.1001/jamanetworkopen.2020.13802

Hänggi, Y. (2004). Stress and emotion recognition: An Internet experiment using stress induction. *Swiss Journal of Psychology*, *63*(2), 113–125. https://doi.org/10.1024/1421-0185.63.2.113

Herzmann, G., Danthiir, V., Schacht, A., Sommer, W., & Wilhelm, O. (2008). Toward a comprehensive test battery for face cognition: Assessment of the tasks. *Behavior Research Methods*, *40*(3), 840–857. https://doi.org/10.3758/BRM.40.3.840

Hindocha, C., Freeman, T. P., Schafer, G., Gardener, C., Das, R. K., Morgan, C. J. A., & Curran, H. V. (2015). Acute effects of delta-9-tetrahydrocannabinol, cannabidiol and their combination on facial emotion recognition: A randomised, double-blind, placebo-controlled study in cannabis users. *European Neuropsychopharmacology*, *25*(3), 325–334. https://doi.org/10.1016/j.euroneuro.2014.11.014

Huijbregts, S. C. J., Griffith-Lendering, M. F. H., Vollebergh, W. A. M., & Swaab, H. (2014). Neurocognitive moderation of associations between cannabis use and psychoneuroticism. *Journal of Clinical and Experimental Neuropsychology*, *36*(8), 794–805. https://doi.org/10.1080/13803395.2014.943694

Jacobus, J., Squeglia, L. M., Escobar, S., McKenna, B. M., Hernandez, M. M., Bagot, K. S., Taylor, C. T., & Huestis, M. A. (2017). Changes in marijuana use symptoms and emotional functioning over 28-days of monitored abstinence in adolescent marijuana users. *Psychopharmacology*, *234*, 3431–3442. https://doi.org/10.1007/s00213-017-4725-3

Jarros, R. B., Salum, G. A., da Silva, C. T. B., Toazza, R., de Abreu Costa, M., de Salles, J. F., & Manfro, G. G. (2012). Anxiety disorders in adolescence are associated with impaired facial expression recognition to negative valence. *Journal of Psychiatric Research*, *46*(2), 147–151. https://doi.org/10.1016/j.jpsychires.2011.09.023

Kanade, T., Cohn, J. F., & Tian, Y. (2000). Comprehensive database for facial expression analysis. *Proceedings Fourth IEEE International Conference on Automatic Face and Gesture Recognition (Cat. No. PR00580)*, 46–53. https://doi.org/10.1109/AFGR.2000.840611

Kaulard, K., Cunningham, D. W., Bülthoff, H. H., & Wallraven, C. (2012). The MPI Facial Expression Database—A validated database of emotional and conversational facial expressions. *PLoS One*, *7*(3), Article e32321. https://doi.org/10.1371/journal.pone.0032321

Keatley, D. A., Walters, I., Parke, A., Joyce, T., & Clarke, D. D. (2020). Mapping the pathways between recreational cannabis use and mood disorders: A Behaviour Sequence Analysis approach. *Health Promotion Journal of Australia*, *31*(1), 38–46. https://doi.org/10.1002/hpja.261

Kedzior, K. K., & Laeber, L. T. (2014). A positive association between anxiety disorders and cannabis use or cannabis use disorders in the general population- a meta-analysis of 31 studies. *BMC Psychiatry*, *14*, Article 136. https://doi.org/10.1186/1471-244X-14-136

Kornreich, C., Brevers, D., Canivet, D., Ermer, E., Naranjo, C., Constant, E., Verbanck, P., Campanella, S., & Noël, X. (2013). Impaired processing of emotion in music, faces and voices supports a generalized emotional decoding deficit in alcoholism. *Addiction*, *108*(1), 80–88. https://doi.org/10.1111/j.1360-0443.2012.03995.x

Kornreich, C., Petit, G., Rolin, H., Ermer, E., Campanella, S., Verbanck, P., & Maurage, P. (2016). Decoding of nonverbal language in alcoholism: A perception or a labeling problem? *Psychology of Addictive Behaviors*, *30*(2), 175-183. https://doi.org/10.1037/adb0000147

Krause, F. C., Linardatos, E., Fresco, D. M., & Moore, M. T. (2021). Facial emotion recognition in major depressive disorder: A meta-analytic review. *Journal of Affective Disorders*, *293*, 320–328. https://doi.org/10.1016/j.jad.2021.06.053

Le Berre, A.-P. (2019). Emotional processing and social cognition in alcohol use disorder. *Neuropsychology, 33*(6), 808–821. https://doi.org/10.1037/neu0000572

Legleye, S., Karila, L., Beck, F., & Reynaud, M. (2007). Validation of the CAST, a general population Cannabis Abuse Screening Test. *Journal of Substance Use*, *12*(4), 233–242. https://doi.org/10.1080/14659890701476532

Lucey, P., Cohn, J. F., Kanade, T., Saragih, J., Ambadar, Z., & Matthews, I. (2010). The extended cohn-kanade dataset (ck+): A complete dataset for action unit and emotion-specified expression. *2010 IEEE Computer Society Conference on Computer Vision and Pattern Recognition-Workshops*, 94–101. https://doi.org/10.1109/CVPRW.2010.5543262

Maple, K. E., Thomas, A. M., Kangiser, M. M., & Lisdahl, K. M. (2019). Anterior cingulate volume reductions in abstinent adolescent and young adult cannabis users: Association with affective processing deficits. *Psychiatry Research: Neuroimaging*, *288*, 51–59. https://doi.org/10.1016/j.pscychresns.2019.04.011

Marinkovic, K., Oscar-Berman, M., Urban, T., O'Reilly, C. E., Howard, J. A., Sawyer, K., & Harris, G. J. (2009). Alcoholism and dampened temporal limbic activation to emotional faces. *Alcoholism: Clinical and Experimental Research*, *33*(11), 1880–1892. https://doi.org/10.1111/j.1530-0277.2009.01026.x

Maurage, P., Campanella, S., Philippot, P., Martin, S., & De Timary, P. (2008). Face processing in chronic alcoholism: A specific deficit for emotional features. *Alcohol: Clinical and Experimental Research*, *32*(4), 600–606. https://doi.org/10.1111/j.1530-0277.2007.00611.x

Maurage, P., Campanella, S., Philippot, P., Vermeulen, N., Constant, E., Luminet, O., & de Timary, P. (2008). Electrophysiological correlates of the disrupted processing of anger in alcoholism. *International Journal of Psychophysiology*, *70*(1), 50–62. https://doi.org/10.1016/j.ijpsycho.2008.05.572

Maurage, P., Grynberg, D., Noël, X., Joassin, F., Hanak, C., Verbanck, P., Luminet, O., de Timary, P., Campanella, S., & Philippot, P. (2011). The "Reading the Mind in the Eyes" test as a new way to explore complex emotions decoding in alcohol dependence. *Psychiatry Research*, *190*(2–3), 375–378. https://doi.org/10.1016/j.psychres.2011.06.015

Mogg, K., Millar, N., & Bradley, B. P. (2000). Biases in eye movements to threatening facial expressions in generalized anxiety disorder and depressive disorder. *Journal of Abnormal Psychology, 109*(4), 695–704. https://doi.org/10.1037/0021-843X.109.4.695

Morris, R. W., Weickert, C. S., & Loughland, C. M. (2009). Emotional face processing in schizophrenia. *Current Opinion in Psychiatry*, *22*(2), 140–146. https://doi.org/10.1097/YCO.0b013e328324f895

National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Board on Population Health and Public Health Practice, & Committee on the Health Effects of Marijuana: An Evidence Review and Research Agenda. (2017). *The health effects of cannabis and cannabinoids: The current state of evidence and recommendations for research*. National Academies Press.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory*. McGraw-Hill.

Passardi, S., Peyk, P., Rufer, M., Wingenbach, T. S., & Pfaltz, M. C. (2019). Facial mimicry, facial emotion recognition and alexithymia in post-traumatic stress disorder. *Behaviour Research and Therapy*, *122*, Article 103436. https://doi.org/10.1016/j.brat.2019.103436

Pereira-Lima, K., & Loureiro, S. R. (2015). Burnout, anxiety, depression, and social skills in medical residents. *Psychology, Health & Medicine*, *20*(3), 353–362. https://doi.org/10.1080/13548506.2014.936889

Phan, K. L., Angstadt, M., Golden, J., Onyewuenyi, I., Popovska, A., & de Wit, H. (2008). Cannabinoid modulation of amygdala reactivity to social signals of threat in humans. *Journal of Neuroscience*, *28*(10), 2313–2319. https://doi.org/10.1523/JNEUROSCI.5603-07.2008

Philippot, P., Kornreich, C., Blairy, S., Baert, I., Dulk, A. D., Le Bon, O., Streel, E., Hess, U., Pelc, I., & Verbanck, P. (1999). Alcoholics' deficits in the decoding of emotional facial expression. *Alcohol: Clinical and Experimental Research*, *23*(6), 1031–1038. https://doi.org/10.1111/j.1530-0277.1999.tb04221.x

Phillips, M. L., Drevets, W. C., Rauch, S. L., & Lane, R. (2003). Neurobiology of emotion perception I: The neural basis of normal emotion perception. *Biological Psychiatry*, *54*(5), 504–514. https://doi.org/10.1016/S0006-3223(03)00168-9

Platt, B., Kamboj, S., Morgan, C. J. A., & Curran, H. V. (2010). Processing dynamic facial affect in frequent cannabis-users: Evidence of deficits in the speed of identifying emotional expressions. *Drug and Alcohol Dependence*, *112*(1–2), 27–32. https://doi.org/10.1016/j.drugalcdep.2010.05.004

Scott, J. C., Slomiak, S. T., Jones, J. D., Rosen, A. F. G., Moore, T. M., Gur, R. C. (2018). Association of cannabis with cognitive functioning in adolescents and young adults: A systematic review and meta-analysis. *JAMA Psychiatry*, *75*(6), 585–595. https://doi.org/10.1001/jamapsychiatry.2018.0335

Shukla, M., Pandey, R., & Lau, J. Y. F. (2019). Assessing emotional processing difficulties in normotensive individuals with high and isolated blood pressure elevations. *International Journal of Psychology*, *54*(2), 214–222. https://doi.org/10.1002/ijop.12462

Smolkina, M., Morley, K. I., Rijsdijk, F., Agrawal, A., Bergin, J. E., Nelson, E. C., Statham, D., Martin, N. G., & Lynskey, M. T. (2017). Cannabis and depression: A twin model approach to co-morbidity. *Behavior Genetics*, *47*, 394–404. https://doi.org/10.1007/s10519-017-9848-0

Sood, P., Bindra, S., & Singh, P. (2023). Modified B. G. Prasad socioeconomic scale: 2022 update of India. *International Journal of Community Medicine and Public Health*, *10*(2), 821–823. https://doi.org/10.18203/2394-6040.ijcmph20230245

Streiner, D. L., Norman, G. R., & Cairney, J. (2014). *Health measurement scales: A practical guide to their development and use*. Oxford University Press.

Sullivan, R. M., Maple, K. E., Wallace, A. L., Thomas, A. M., & Lisdahl, K. M. (2022). Examining inhibitory affective processing within the rostral anterior cingulate cortex among abstinent cannabis-using adolescents and young adults. *Frontiers in Psychiatry*, *13*, Article 851118. https://doi.org/10.3389/fpsyt.2022.851118

Twomey, C. D. (2017). Association of cannabis use with the development of elevated anxiety symptoms in the general population: A meta-analysis. *Journal of Epidemiology and Community Health*, *71*, 811–816. https://doi.org/10.1136/jech-2016-208145

UNODC. (2018). *World Drug Report 2018*. United Nations Publication.

Wittchen, H.-U., Fröhlich, C., Behrendt, S., Günther, A., Rehm, J., Zimmermann, P., Lieb, R., & Perkonigg, A. (2007). Cannabis use and cannabis use disorders and their relationship to mental disorders: A 10-year prospective-longitudinal community study in adolescents. *Drug and Alcohol Dependence*, *88(*Supplement 1), S60–S70. https://doi.org/10.1016/j.drugalcdep.2006.12.013

A. KUMARI ET AL. Emotion Recognition and Differentiation in Cannabis Abstainers Over Time

Appendix

Table 1. Pearson's Product-Moment Correlations of Various Variables in the Study Related to Cannabis Use, Emotional Processing, and Mental Health Problems

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1. Frequency of Cannabis Use	1																							
2. Quantity of Cannabis Use	.53***	1																						
3. Age of Onset Of Cannabis Use	.21	.16	1																					
4. Anxiety (T0)	-.26	-.14	-.02	1																				
5. Anxiety (T1)	-.05	-.08	.04	.58***	1																			
6. Anxiety (T2)	.15	.12	.05	.22	.55***	1																		
7. Depression (T0)	.25	.44**	-.14	.15	.01	.10	1																	
8. Depression (T1)	-.08	.26	-.20	.25*	.12	-.03	.48***	1																
9. Depression (T2)	.28	.09	.07	.24*	.49***	.84***	.23	.06	1															
10. Stress (T0)	.08	.04	.00	.25	.39***	.24*	.37***	.18	.20	1														
11. Stress (T1)	.01	-.08	.02	.30*	.54***	.18	-.02	.27*	.04	.59***	1													
12. Stress (T2)	.40*	.12	.11	.10	.49***	.81***	.16	-.02	.81***	.28*	.19	1												
13. Withdrawal Intensity (T1)	-.03	.09	-.16	.48***	.54***	.41***	.41***	.35**	.37**	.47***	.35**	.40**	1											
14. Withdrawal Intensity (T2)	.14	.09	-.07	.22	.34**	.72***	.28*	.12	.75***	.24*	.14	.73***	.62***	1										
15. Withdrawal Impact (T1)	-.05	.01	-.18	.31*	.29*	.28*	.41***	.24*	.37**	.36**	.10	.29*	.81***	.55***	1									
16. Withdrawal Impact (T2)	.15	.11	-.12	.08	.28*	.68***	.25*	.11	.75***	.17	.06	.70***	.52***	.91***	.57***	1								
17. Emotion Recognition Accuracy (T0)	.02	-.25	.09	.29*	.52***	.43***	-.06	-.14	.41***	.29*	.34**	.48***	.15	.26*	-.02	.14	1							
18. Emotion Recognition Accuracy (T1)	-.30	-.04	.05	.30*	.61***	.48***	-.06	-.14	.35**	.32**	.29*	.41***	.30*	.26*	.13	.17	.49***	1						
19. Emotion Recognition Accuracy (T2)	-.32*	-.23	.10	.14	.54***	.40***	-.19	-.08	.27*	.18	.27*	.40***	.17	.18	.01	.11	.44***	.66***	1					
20. Emotion Recognition RT (T0)	.10	.09	-.12	.04	-.08	-.08	.11	.15	.13	-.25*	-.31*	-.11	.07	-.04	.20	.03	-.12	-.19	-.03	1				
21. Emotion Recognition RT (T1)	.16	.18	.01	-.03	.20	.07	-.14	.13	.06	-.21	.09	.09	-.05	-.10	-.05	-.06	.09	-.01	.22	.02	1			
22. Emotion Recognition RT (T2)	-.11	-.19	-.05	.07	-.23	-.13	-.02	-.03	.03	-.19	-.30*	-.11	-.06	-.00	.11	-.03	-.12	-.05	-.17	-.02	-.07	1		
23. Emotion Differentiation (T0)	.11	-.04	.01	-.01	.20	.11	-.19	-.06	-.01	.12	.24	.12	-.07	-.20	-.12	-.19	.26*	.05	.16	-.16	.15	-.19	1	
24. Emotion Differentiation (T1)	-.03	-.12	-.10	.14	.41***	.19	-.15	-.06	.03	.06	.24*	.16	.04	-.06	-.05	-.14	.37**	.26*	.36**	-.14	.27*	-.23	.51***	1
25. Emotion Differentiation (T2)	-.08	-.07	-.02	.17	.41***	.14	-.06	-.03	.01	.29*	.36**	.11	.09	-.13	.02	-.18	.28*	.34**	.34**	-.11	.14	-.42***	.46***	.61***

Note. T0 = 0 days into abstinence; T1 = 15 days into abstinence; T2 = 30 days into abstinence; RT = response time.
*$p < .05$; **$p < .01$; ***$p < .001$.

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RESEARCH ARTICLE

Development and Validation of the Hungarian Short ECR-R in a Large Nationally Representative Study and a Large Community Study of Mothers Raising Young Children

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Introduction: The Hungarian version of the 36-item self-report Experiences in Close Relationships – Revised (ECR-R-HU) questionnaire assessing adult romantic attachment has been published recently. Short versions provide a useful tool for large-scale research and in the clinical field as well.
Aims: The present study reports developing and validating the short form of the Hungarian version of the ECR-R (ECR-R-HU-SF).
Methods: The development of the short form, data reduction, and item selection were performed in a nationally representative adult (18+) community sample (N = 958; Study 1). The newly developed ECR-R-HU-SF was then tested and validated in a different national study representative of children aged 3–36 months, using data from respondent mothers with diverse sociodemographic backgrounds (N = 980; Study 2).
Results: In Study 1, using randomly split subsamples, the ECR-R-HU-SF retained 8 items and confirmed the original two-factor structure of the measure. The subscales showed very good reliability and correlated highly with their corresponding original long versions. Psychometric properties, construct (convergent) validity, sociodemographic associations, and mean population scores for the short-version subscales *(Avoidance, Anxiety)* were compared with those of the long version. In Study 2, subscales were highly reliable, and scores correlated in the expected directions with related constructs (depressive mood, perceived stress).
Conclusions: In summary, the ECR-R-HU-SF is a valid instrument that can be used as an effective screening tool for measuring adult romantic attachment.

Keywords: adult romantic attachment, ECR-R-HU-SF, psychometric parameters, validation, large representative samples

Introduction

Attachment theory (Bowlby, 1969/1982) offers a complex framework for modern researchers and clinicians aiming at better understanding intrapersonal and relational outcomes, such as affect regulation and psychopathology. Although initially, attachment theory focused on the *asymmetric parent-child relationship*, its founder, John Bowlby,

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already described how attachment experiences might influence individuals over their entire life course. According to Bowlby, early attachment-related experiences are internalized and have a profound influence on later interactions with intimate partners, especially under stress. The so-called internal working models are mental representations of significant others, the self, and the self in relation to others that guide affect, cognition, and behavior in intimate relationships (Bowlby, 1973).

Hazan and Shaver (1987) proposed that Bowlby's attachment theory could be extended to *symmetric, romantic relationships*, introducing the concept of *adult romantic attachment*. Since their initial proposal, a multitude of cross-sectional studies have aimed at investigating the concept of romantic attachment and numerous questionnaires have been created measuring the construct, which were thoroughly reviewed by Ravitz et al. (2010).

An important milestone in the measurement of adult romantic attachment was the development of the Experiences in Close Relationships questionnaire (Brennan et al., 1998). The authors based their measure on all the items previously published in questionnaires measuring adult attachment styles. A pool of 323 items remained after eliminating redundant items, which the authors administered to 1,086 undergraduates. A detailed factor analysis yielded 36 items, which were grouped into two factors identified as attachment-related *Avoidance* and attachment-related *Anxiety*. The above-identified underlying factors of the ECR offered a new dimensional view of attachment styles, providing a more in-depth understanding of the earlier categorical classifications (Bartholomew & Horowitz, 1991).

According to modern taxometric analyses, the variation underlying adult romantic attachment is distributed continuously (Booth-LaForce & Roisman, 2014) on the two dimensions of attachment-related *Avoidance* and attachment-related *Anxiety*. Attachment-related *Avoidance* is associated with a tendency of feeling uncomfortable with closeness and even rejecting it, while attachment-related *Anxiety* is described as a strong desire for close relationships, which is coupled with the fear of abandonment and hypervigilance regarding rejection.

The Development of the ECR-R

To improve the accuracy and reliability of the ECR, Fraley et al. (2000) used factor analysis and item-response theory to develop a revised version of the measure: The Experiences in Close Relationships-Revised (ECR-R). This resulted in a partially new 36-item version of the original ECR questionnaire, maintaining the original subscales: *Avoidance* and *Anxiety*. Items were retained based on their discriminatory values. Although numerous researchers are still using the unimproved initial version (ECR; Brennan et al., 1998) and its short form (ECR-S; Wei et al., 2007), in the following, we will review uniquely validated versions of the ECR-R (Fraley et al., 2000) measuring solely romantic relationships and their short forms.

Since its conception, the ECR-R has been translated into 20 languages of which 14 are European (Czech, Danish, Dutch, French, German, Greek, Hungarian, Italian, Polish, Romanian, Russian, Serbian, Slovak, Spanish) and six are non-European (Arabic, Chinese, Hindi, Korean, Thai, Turkish). In most of the above-mentioned validation studies (16 out of 20), the authors found that the psychometric properties of the ECR-R were most parsimoniously described by a two-factor solution. However, the two-dimensional structure could not be fully confirmed by all authors and there were three studies that could not confirm the original two-factor model at all with Confirmatory Factor Analysis (Esbjørn et al., 2015; Kim et al., 2011; Lubiewska et al., 2016). Wording problems of the items was the most commonly cited limitation of the scale, which several authors (Dupont et al., 2022; Kim et al., 2011; Lubiewska et al., 2016) tried to solve statistically by using method factors. Others suggested shortening the scale by deleting items with similar wording or with low factor loadings to ameliorate the poor model fit (Fairchild & Finney, 2006; Hanak & Dimitrijevic, 2013; Kumar, 2022; Rotaru & Rusu, 2013; Wongpakaran et al., 2011).

Short Form Measures and Short Versions of the ECR-R

The development of short forms in clinical assessment dates back to the beginning of the 20th century (Doll, 1917). Although some reviews have been critical of the short-form methodology in general (Smith & McCarthy, 1995), researchers have developed short versions for virtually every conceivable topic of clinical assessment. The reasons behind opting for this alternative are numerous: developing a short form that can offer a valid and reliable timesaving alternative to the full-length version for e.g., screening purposes; fitting the short versions into large multivariate studies; for use with children etc. However, it is necessary for researchers to follow a thorough methodology to obtain rigorous, valid, comprehensive measures. Smith et al. (2000) offer such methodological guidelines for improving the validity of short-form measures.

The growing number of published short versions of the ECR-R reflects the need for a timesaving tool to be used not only for research but also for monitoring and screening purposes in clinical settings. According to a literature review, eleven different short forms of the ECR-R have emerged (Arab, Czech, Korean, Polish, Russian, Slovak, Spanish, and two different ones in Thai and German). According to Brenk-Franz et al. (2018), such concise measures should have good psychometric indicators and not consist of more than 10 to 15 items. The above-mentioned brief versions of the ECR-R consist of 8 to 18 items. To our knowledge, two English-language short-form variants exist so far. The ECR-R-GSF (Wilkinson, 2011) reports the psychometric properties of general (not specific to romantic relationships) attachment avoidance and anxiety in Australian adolescents and young adults. The other 9-item short Relationship Structures Questionnaire (ECR-RS; Franley, 2011), has been created to assess attachment patterns separately in a variety of close relationships. Here, we review nine of the above-mentioned studies that have been specifically designed to assess the representations of romantic relationships in adult populations and used the original 36-item ECR-R for validation.

The first short version of the ECR-R was developed by Wongpakaran and Wongpakaran (2012) in the Thai language and retained 18 items. The Czech and Polish versions (Kaščáková et al.; Lubiewska et al.) were published in 2016, each retaining 16 items. The Russian version (Chistopolskaya et al., 2018) was developed using 14 items, and the first German version retained 12 items (Brenk-Franz et al., 2018). A second German short form (Ehrenthal et al., 2021) included 8, and the Slovak version (Švecová et al., 2021) retained 14 items. Later, the Korean 12-item short version (Lee et al., 2023), and the second Thai short form (Wongpakaran et al., 2023), with only 10 items, were published. The two subscales (*Avoidance*, *Anxiety*) were represented with an equivalent number of items in all of the above-mentioned studies.

Below, we summarize the samples that have been used in the different studies. Only three of the studies (German, Czech, Slovak: Ehrenthal et al., 2021; Kaščáková et al., 2016; Švecová et al., 2021) used nationally representative samples, while the other six studies used convenience sampling. The Polish researchers (Lubiewska et al., 2016) applied the snowball method and included adults between 16 and 81 years in their sample, whereas the Russian study (Chistopolskaya et al., 2018) used a student sample. The Korean study (Lee et al., 2023) used an online sample of voluntary college students. The first German study (Brenk-Franz et al., 2018) used a sample of general practice patients and the two Thai studies (Wongpakaran et al., 2023; Wongpakaran & Wongpakaran, 2012) compared non-clinical and clinical (stable psychiatric patients) adult samples.

Item-selection was based on different (usually more than one) methodological considerations e.g., on model fit or modification indices in CFAs, high factor loadings in Exploratory Factor Analyses (EFAs), high item-scale correlations, Rasch analysis, views of experts, and content-analysis (where redundant items were excluded). Internal consistencies of the subscales calculated using Cronbach's alphas or McDonald's omegas were good to excellent (for *Avoidance*: .73 - .90; for *Anxiety*: .82 - .89). According to our review, only three studies (Ehrenthal et al., 2021; Lee et al., 2023; Lubiewska et al., 2016) mentioned the important results regarding correlations between the subscales of the short form and the full version. The subscales of these short versions correlated very highly with the full-scale version subscales (*Avoidance*: r = .90 - .96; *Anxiety*: r = .92 - .97).

It is important to mention that in the Polish sample (Lubiewska et al., 2016), a statistically significant difference manifested between the mean *Avoidance* scores when comparing the long (M = 3.00, SD = NA) and the short versions (M = 2.59, SD = NA). Other studies have not addressed this important methodological issue.

Authors mainly used Confirmatory Factor Analysis to analyze the factor structure of the newly developed short forms, to check if they corresponded to the original two-factor structure of the full-version scale. Ehrenthal et al. (2021) aimed at refining and evaluating the 12-item short version of the German ECR-RD by means of CFA. According to the authors, the earlier 12-item version (Brenk-Franz et al., 2018) that employed Principal Components Analysis (PCA) on a large sample of aggregated data from published and unpublished studies did not allow for a rigorous test involving the assumed two-factor structure of the ECR-R. Ehrenthal et al. (2021) used a large nationally representative sample (N = 2,508) to refine the ECR-RD-12. They further reduced the short form to 8 items to obtain a good model fit in CFA. The Czech, the Slovak, the two Thai and the Russian studies (Chistopolskaya et al., 2018; Kaščáková et al., 2016; Švecová et al., 2021; Wongpakaran & Wongpakaran, 2012) also employed CFAs. The method was unclear or not mentioned in the Polish study (Lubiewska et al., 2016). The problematic nature of reverse-coded items mentioned by several authors was addressed in two studies (Lee et al., 2023; Wongpakaran & Wongpakaran, 2012), in which the authors used method factors (for positively and negatively worded items) in order to obtain an acceptable level of fit for the model.

In summary, to improve the psychometric properties of the short forms, authors either excluded problematic items (reverse-coded items, low loadings, cross-loadings) (Ehrenthal et al., 2021; Švecová et al., 2021;

Wongpakaran et al., 2023) while maintaining important content, or used method factors (Lee et al., 2023; Wongpakaran & Wongpakaran, 2012).

Below, we review demographic associations of attachment-related *Avoidance* and *Anxiety* mentioned in five out of the eight reviewed short forms. Considering gender differences, only the 8-item German version found that females had slightly higher *Anxiety* scores (Ehrenthal et al., 2021), while none of the other studies found significant associations between gender and the two subscales (Brenk-Franz et al., 2018; Kaščáková et al., 2016; Švecová et al., 2021; Wongpakaran et al., 2023; Wongpakaran & Wongpakaran, 2012). Five studies mentioned associations with age. In one study, older age was associated with lower *Anxiety* (Brenk-Franz et al., 2018); in another, the older, 65+ age group showed higher *Avoidance* and lower *Anxiety* compared to the younger age groups of 18–24 and 25–34 years (Švecová et al., 2021). The three remaining studies (Brenk-Franz et al., 2018; Kaščáková et al., 2016; Wongpakaran et al., 2023) did not find any noteworthy associations with age. Two studies mentioned education level, one of which found no significant relationship with attachment insecurity (Brenk-Franz et al., 2018), while the other one reported that higher education level was associated with significantly lower *Avoidance* scores (Kaščáková et al., 2016). Relationship status was mentioned in three studies. Participants who were not in a relationship at the time of the study showed significantly higher *Avoidance* scores (Kaščáková et al., 2016), or higher scores in both the *Avoidance* and *Anxiety* subscales (Ehrenthal et al., 2021). Brenk-Franz et al. (2018) did not find any significant associations with relationship status.

Construct (convergent and divergent) validity was assessed in all but one study (Lubiewska et al., 2016) using a variety of different constructs (reassurance seeking, support seeking, loneliness, dyadic satisfaction, depression, anxiety, fear of intimacy, self-efficacy, perceived stress, self-esteem, neuroticism, positive and negative affect, positive and negative time perspective, hardiness), as well as another measure of attachment (The Relationships Questionnaire; Bartholomew & Horowitz, 1991). While associations between the above-mentioned constructs and the two subscales varied across studies, a predominant trend emerged, which revealed low to moderate significant correlations in the anticipated directions.

Aims and Hypotheses of the Present Study

In the present study, we aimed at developing and validating the short form of the Hungarian version, the ECR-R-HU (Dupont et al., 2022) by means of rigorous methods (Smith et al., 2000). Attachment-related *Avoidance* and *Anxiety* are important constructs for various academic and applied research areas. The different short forms of the ECR-R not only provide a useful tool for large-scale research where the number of possible items per instrument is limited, but may also be useful in the clinical field (e.g., in systemic family therapy, couples therapy, studies on parent-child relationship, other social connections and well-being) for short screening or assessment, and for follow-up measurements throughout therapy.

In Study 1, data reduction and item selection (based on EFA/PCA results and expert opinions) were performed on a randomly split subsample of the same nationally representative community sample ($N = 958$) that was used for validating the ECR-R-HU (Dupont et al., 2022). The factor structure (CFA) was examined and confirmed in the other randomly split subsample. Psychometric properties (Cronbach's alphas and McDonald's omegas), convergent validity, sociodemographic associations, and mean population scores (including standard deviations) for the short-version subscales (*Avoidance, Anxiety)* were checked and compared with the 36-item long version (Dupont et al., 2023a) in the entire sample.

In Study 2, for testing the newly validated short instrument, we used a sample from another national study called "Infancy in 21st century Hungary" (Danis et al., 2020). In this research, the primary respondents ($N = 980$) were mothers raising children aged 3–36 months. Although this sample was nationally representative in terms of the children's age, gender, and type of residence, consequently, it was also sufficiently diverse for sociodemographic parameters. This sample included a slightly higher proportion of families with low SES compared to a representative sample (See *Table 1*). This allowed us to test the cultural validity of the tool and address the following question: do the items work well with lower levels of education? Theoretically, the ECR-R-SF-HU was considered a valuable tool in the study of early development, since according to the literature (Meuti et al., 2015; Simpson & Rholes, 2019), adult romantic attachment representations may also serve as an important background variable for understanding the development of early parent-child relationships. The factor structure and the psychometric properties (Cronbach's alphas and McDonald's omegas) of the short-form measure were tested again, construct (convergent) validity, mean population scores and the relationships with sociodemographic characteristics were also examined (Dupont et al., 2023b).

Hypotheses:

1. The Hungarian short version demonstrates acceptable psychometric properties and aligns with the theoretically expected two-factor structure.
2. The factor structure and the psychometric properties of the scale are similar in both the nationally representative adult sample (Study 1) and the sample of Hungarian mothers of 3–36 months old children (Study 2).
3. The subscales (*Avoidance, Anxiety*) correlate in the expected directions with related constructs: positively with family functioning problems, perceived stress, and depressed mood, and negatively with well-being.

Methods

Participants and Data Collections

Development of the Short Form – Study 1

A nationally representative online sample was used to develop the Hungarian short version of the ECR-R (ECR-R-HU-SF). Data collection was carried out by a Hungarian research company with expertise in social surveys and data collection. Dupont et al. (2022) described the sampling and data collection methods in detail. To obtain a nationally representative sample, respondents were randomly selected following the stratification of the total voluntary sample according to gender, age, education and settlement type. For the stratification, besides gender, the sample was divided into five age groups (18–29, 30–39, 40–49, and 50–59 years of age, and 60 years of age or older) and three categories of education level (primary and vocational school, secondary, and higher education). The true proportions of settlement types (capital, cities/towns, and villages) and regions (Central, Eastern, and Western Hungary) were also among the stratification criteria.

The total sample size was $N = 993$, but the number of respondents to the ECR-R-HU questions was reduced to $N = 958$, as the questionnaire was not offered to participants who claimed that they had never been in a romantic relationship. Table 1 summarizes the sample characteristics.

After the first, main wave of data collection in December 2018, a second wave was carried out to assess the stability of the ECR-R-HU subscales. This secondary survey, completed after a four-month gap, was administered again to a smaller subsample ($N = 98$) of the original participant pool.

New Validation – Study 2

To test the short instrument developed in Study 1, we used a large parent survey (*Infancy in 21st Century Hungary;* Danis et al., 2020), in which families raising children aged 3–36 months were included. Here, we reported results from maternal data ($N = 980$). This sample was representative regarding children's age, gender, and type of residence, resulting in a high degree of diversity in sociodemographic characteristics (see Table 1) within the parent-family background. Data collection and sampling were also conducted by a Hungarian research institute in the winter of 2019–2020. The parents were interviewed using a CAPI (computer-assisted personal interview) instrument and they also completed a self-administered questionnaire (SAQ). The ECR-R-HU-SF as well as the instruments used for convergent validity were all part of the measurement package, which was planned by an interdisciplinary research network coordinated by the Institute of Mental Health at Semmelweis University. For this report, we only considered responses provided by the mothers. ECR-R-HU-SF was filled out by 953 mothers (for sample characteristics see Table 1). The data shows their romantic attachment orientation.

Measures

The Hungarian Version of the Experiences in Close Relationships – Revised Questionnaire (ECR-R-HU) – Study 1

ECR-R-HU (Dupont et al., 2022; Gervai et al., 2018; Hungarian translation: https://www.ttk.hun-ren.hu/wp-content/uploads/kpi-modszer/Tapasztalatok_Szoros_Kapcsolatokban_ECR-R-HU.pdf) is the adapted Hungarian translation of the ECR-R (Fraley et al., 2000). It is a self-report measure of adult attachment, containing 36 items and two subscales that assess attachment-related *Avoidance* and *Anxiety* (18 items each). Respondents use a 7-point Likert-type scale to indicate their level of agreement with each item, where 1 = strongly disagree and

7 = strongly agree. The following instructions are given to the participants: "Please take a moment to think about your previous and current romantic experiences and indicate the level of your agreement with each statement". According to a meta-analysis of self-report measures regarding adult attachment, the ECR-R had the highest reliability scores (Graham & Unterschute, 2015). In the Hungarian study (Dupont et al., 2022), the ECR-R-HU demonstrated high Cronbach's alpha values (*Avoidance*: α = .91 and *Anxiety*: α = .92) as well.

Table 1. Sample Characteristics of Study 1 & 2

		Study 1 Wave 1	Study 1 Wave 2	Study 2
		(N = 958)	*(N = 98)*	*(N = 953)*
		Frequency (valid %)	Frequency (valid %)	Frequency (valid %)
CATEGORICAL VARIABLES				
Gender	Male	467 (48.7%)	53 (54.1%)	0 (0%)
	Female	491 (51.3%)	45 (45.9%)	953 (100%)
Age	18–29 years	110 (11.5%)	9 (9.2%)	457 (47.9%)
	30–39 years	169 (17.6%)	22 (22.4%)	447 (46.9%)
	40–49 years	237 (24.7%)	23 (23.5%)	50 (5.2%)
	50–59 years	224 (23.4%)	17 (17.3%)	0 (0%)
	60 years or older	218 (22.8%)	27 (27.6%)	0 (0%)
Type of residence	Capital (Budapest)	194 (20.2%)	20 (20.4%)	148 (15.6%)
	Cities and towns	544 (56.8%)	56 (57.1%)	407 (51.1%)
	Villages	220 (23.0%)	22 (22.4%)	317 (33.3%)
Education	Primary school or less	46 (4.8%)	2 (2.0%)	108 (11.3%)
	Skilled worker / vocational school	275 (28.7%)	30 (30.6%)	216 (22.7%)
	Secondary school	373 (38.9%)	35 (35.7%)	456 (48.0%)
	College, university	264 (27.6%)	31 (31.6%)	171 (20%)
In a relationship currently?	Yes	749 (78.2%)	77 (78.6%)	899 (94.6%)
	No	209 (21.8%)	21 (21.4%)	52 (5.4%)
		Mean *(SD)* (range)	Mean *(SD)* (range)	
CONTINUOUS VARIABLES				
Age		47.89 (13.85) (18–89)	48.85 (14.63) (22–78)	30.32 (5.8) (18–47)
Length of being without a partner in years (in Study 1: *n* = 209; *n* = 21)		4.95 (5.08) (0–25)	4.00 (4.91) (0–20)	
Number of children		1.38 (1.21) (0–5)	1.32 (1.18) (0–5)	1.57 (0.98) (1–10)
Number of people living in the same household		2.75 (1.28) (1–8)	2.45 (1.07) (1–5)	3.70 (1.16) (2–10)

The WHO Well-Being Questionnaire (WBI-5) – Study 1

The WHO Well-Being Questionnaire (WBI-5; WHO, 1998; Topp et al., 2015; Hungarian version: Susánszky, 2006) is a widely used self-report measure that assesses psychological well-being using 5 short questions rated on a 4-point Likert-type scale. The previously validated Hungarian version had high internal consistency (α = .85). In Study 1, the Cronbach's alpha was α = .87.

Perceived Stress Scale-4 (PSS-4) – Study 1 & 2

The Perceived Stress Scale-4 (PSS-4; Cohen et al., 1983; Hungarian version: Stauder & Konkolÿ Thege, 2006) is a widely used shortened instrument for measuring the perception of current everyday stress. It contains four items that measure the degree to which one's life has been perceived as "unpredictable, uncontrollable, and overloading" (Cohen et al., 1983; p. 387) in the past month. A 5-point Likert-type scale is used for rating each item. Acceptable internal consistency (α = .79) and excellent test-retest reliability (*r* = .90) characterized the Hungarian version (Stauder & Konkolÿ Thege, 2006). Cronbach's alpha in Study 1 was α = .80, in Study 2 α = .70.

Depression Scale Questionnaire (DS1K) – Study 1 & 2

The Depression Scale Questionnaire has been developed by Hungarian researchers (DS1K; Halmai, 2008). It measures the depression construct and was derived from the Beck Depression Inventory (BDI; Beck et al., 1961) and the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983). The 11-item single summary scale can be used for screening less severe stages of and a predisposition to depression. The items are rated on a 4-point Likert-type scale. It is a valid measure with high reliability (α = .88) and is widely used in Hungary. The Cronbach's alpha was α = .85 in Study 1 and for a 10-item version (because of more appropriate psychometric properties) α = .77 in Study 2.

The Family Assessment Device (FAD) – Study 1

The Family Assessment Device (FAD; Epstein et al., 1983; Hungarian version: Danis et al., 2005; Danis et al., 2022) is a self-report questionnaire that measures structural, organizational, and transactional characteristics of families and is widely used in both research and clinical practice. It is used for screening, for identifying specific problem domains and for assessing change. Family members (aged above 12 years) rate 60 statements concerning the family on a 4-point Likert type scale depending on how well each statement describes their family. In numerous international validation studies, the Cronbach's alpha values of the 6 subscales were around or above α = .70 (Hamilton & Carr, 2016; Staccini et al., 2015). The reliability scores of the subscales in the database of Study 1 were similar to the aforementioned studies: problems of affective involvement (α = .74), affective responsiveness (α = .86), behavioral control (α = .64), communication (α = .81), problem-solving (α = .80), and roles (α = .82) in the family; a seventh subscale measures the problem of general family functioning (α = .89).

Statistical Analyses

A Principal Component Analysis (PCA) with varimax rotation was conducted for data reduction in a randomly split subsample (*n* = 477) in Study 1. Our preliminary examinations showed that Principal Axis Factoring (PAF) for exploring the factor structure and PCA for maximizing the variance of the minimum number of latent components produced almost identical results, consistent with findings regularly reported in scientific literature (Avsar, 2022; Schreiber, 2021). PCA is still commonly recommended (Hind & Soussi Noufail, 2022) for dimension reduction and also item (feature) selection. It aims at selecting a subset of "highly predictive" variables from a larger group of variables. In varimax rotation, orthogonal principal components capture the maximum variance in the data and are linear combinations of the original variables. The components are ordered by decreasing importance and aim to maximize the independence of the factors, ensuring a more even distribution of items across the latent components. We used this method to examine and choose the most important items with the highest factor loadings, aiming to find a subset that provided the "best overall summary" of the dimensions. Item selection was based on statistical (factor loadings), theoretical and methodological considerations.

Confirmatory Factor Analyses were conducted using AMOS 21.0 in the other randomly split subsample (*n* = 481) of Study 1 and in Study 2 in order to test the original (Fraley et al., 2000) two-factor model for the

8-item short form in both samples. Maximum likelihood estimations were employed, and model fit indices were examined (Browne & Cudeck, 1992; Hu & Bentler, 1999). We applied the robust Chi Square Test of Model Fit (χ^2/df ratio; indicates a good model fit below 3), a baseline close fit index (Steiger-Lind Root Mean Square Error of Approximation – RMSEA), the standardized root mean square residual (SRMR), and three incremental close-fit indices (Comparative Fit Index – CFI, Tucker and Lewis's Index of Fit – TLI, and Normed Fit Index – NFI). CFI, TLI and NFI values that are equal to or above .90 indicate a satisfactory fit, while values close to 1.00 (> .95) suggest a very good fit. For RMSEA, a value < .11 indicates a reasonable fit, and a value ≤ .05 indicates a good model fit. For RMSR, if the value is < .05, it is excellent, between .05 and .08 it is adequate.

The internal consistencies of the two subscales (*Avoidance* and *Anxiety*) were evaluated by Cronbach's alphas and McDonald's omegas. Since according to the Kolmogorov-Smirnov Test the ECR-R-HU-SF subscale scores were not normally distributed in either sample, we used non-parametric statistical tests for further analyses. Since the sample in Study 2 was a weighted representative sample, non-parametric ranking procedures may change the sample size slightly according to the weights.

In Study 1, Spearman correlations were used to test temporal stability and compare the scales of the short form with the original, 36-item questionnaire. Mann-Whitney and Kruskal-Wallis tests were used in both studies to examine relationships between the ECR-R-HU-SF subscales and sociodemographic characteristics, while Spearman correlations were calculated to assess the convergent validity with different psychosocial constructs.

Results

Study 1

Data Reduction and Item Selection

In accordance with methodological guidelines, we conducted analyses on two randomly split subsamples (n = 477 and 481) of the entire sample. Following data reduction, we selected 8 items for the short version in the first random subsample (n = 477). Statistical considerations and experts' opinions on covering content dimensions as well as avoiding redundancy were combined in the course of item selection.

Statistically, for data reduction and selecting the most appropriate items, we used the Principal Component Analysis (PCA). In the Rotated Component Matrix obtained by PCA (KMO = .94; Bartlett's Test of Sphericity: p < .001; all items' communality values > .45; see item loadings in Table 2), the original two scales of the ECR-R published by Fraley et al. (2000) decomposed into two main factors (F1, F2) and two further factors (F3, F4) with balanced proportions of explained variances (59.4% explained; F1: 22.6%, F2: 18.5%, F3: 8.6%, F4: 5.7%). According to the scree plot and eigenvalue analyses, a fifth factor was also selected, but it had a low explained variance (F5: 4.0%) and no significant or distinct content.

Table 2. Rotated Component Matrix[a] in the Principal Component Analysis in a Randomly Split Subsample (n = 477) of Study 1

		Components				
		F1: Anxiety	F2: Avoidance (reversed items)	F3: Avoidance	F4: Anxiety (reversed items)	F5: Mixed
3	**I often worry that my partner doesn't really love me.**	**.83**				
8	When I show my feelings for romantic partners, I'm afraid they will not feel the same about me.	.77				
7	**When my partner is out of sight, I worry that he or she might become interested in someone else.**	**.75**				
12	**I find that my partner(s) don't want to get as close as I would like.**	**.74**				
4	I worry that romantic partners won't care about me as much as I care about them.	.72				.37
17	I worry that I won't measure up to other people.	.70				

(continued on the next page)

Table 2. continued

		Components				
		F1: Anxiety	F2: Avoidance (reversed items)	F3: Avoidance	F4: Anxiety (reversed items)	F5: Mixed
14	My desire to be very close sometimes scares people away.	.70				
16	***It makes me mad that I don't get the affection and support I need from my partner.***	***.70***				
2	I often worry that my partner will not want to stay with me.	.69			-.41	
10	My romantic partner makes me doubt myself.	.68				
15	I'm afraid that once a romantic partner gets to know me, he or she won't like who I really am.	.64		.35		
18	My partner only seems to notice me when I'm angry.	.63				
13	Sometimes romantic partners change their feelings about me for no apparent reason.	.62		.36		
6	I worry a lot about my relationships.	.62				
5	I often wish that my partner's feelings for me were as strong as my feelings for him or her.	.51				.49
1	I'm afraid that I will lose my partner's love.	.50			-.47	.36
33	***I feel comfortable depending on romantic partners.***		***.80***			
29	***It helps to turn to my romantic partner in times of need.***		***.80***			
34	*I find it easy to depend on romantic partners.*		*.79*			
36	***My partner really understands me and my needs.***		***.75***			
28	***I usually discuss my problems and concerns with my partner.***		***.75***			
31	*I talk things over with my partner.*		*.72*			
30	*I tell my partner just about everything.*		*.69*			
20	*I feel comfortable sharing my private thoughts and feelings with my partner.*		*.64*			
22	*I am very comfortable being close to romantic partners.*		*.63*			
35	*It's easy for me to be affectionate with my partner.*		*.60*			
27	*It's not difficult for me to get close to my partner.*		*.56*			
26	*I find it relatively easy to get close to my partner.*		*.56*			
32	I am nervous when partners get too close to me.			.71		
25	I get uncomfortable when a romantic partner wants to be very close.			.71		
24	I prefer not to be too close to romantic partners.			.71		
23	I don't feel comfortable opening up to romantic partners.	.38		.56		
19	I prefer not to show a partner how I feel deep down.			.49		.40
11	*I do not often worry about being abandoned.*				*.68*	
9	*I rarely worry about my partner leaving me.*				*.59*	
21	I find it difficult to allow myself to depend on romantic partners.			.43		.44

Note. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
[a] Rotation converged in 8 iteration.
[b] Item numbers according to Fraley et al. (2000). Bold numbers indicate the items retained in the ECR-R-HU-SF.
[c] Items in italics are reversed.

As shown in Table 2, *Avoidance* items were loaded highly on F2 and F3, while *Anxiety* items were loaded highly on F1 and F4. In our previous analyses and methodological article (Dupont et al., 2022), we identified a methodological issue in the wording of the ECR-R items. This problem led to splitting the dimensions into separate factors, which could be avoided by introducing method factors in CFA (For details on the problems of reversed items in modeling the factor structure, see Dupont et al., 2022). To prevent fragmentation of the dimensions in a very short instrument due to differences in wording and item content, only 4 items were selected from each of the two main factors (F1, F2). In earlier stages of our work, we tried selecting 6 items from each of the two dimensions: 4+2 items from the main and the secondary factors (F2+F3 for *Avoidance*; F1+F4 for *Anxiety*). However, in both the CFA and EFA analyses, we found that items were transferred from one dimension to the other according to wording and direction of meaning. We aimed to avoid such methodological inconsistencies in the short instrument by selecting items only from the two main factors. We preferred items with simple and clear psychometric characteristics that had higher factor loadings than .65. When we encountered redundancy between items, we preferred items with simpler wording, and items included in other European short versions if possible (Items 12, 16, 28, 29 were included in at least three other Central European versions). It was important that, in terms of content, each of the selected items highlighted a distinct aspect of the construct. The four selected *Avoidance* items were 28, 29, 33, 36, while the four items selected for *Anxiety* were 3, 7, 12, 16 (Gervai et al., 2019; Hungarian translation: https://www.ttk.hun-ren.hu/kpi/wp-content/uploads/sites/4/2024/09/Tapasztalatok-Szoros-Kapcsolatokban-rovid-valtozat-ECR-R-HU-SF.pdf). (Note: Here, in the article, item numbers correspond to Fraley et al., 2000). All four *Avoidance* items loaded highly (.75–.80) on the second component (*Avoidance* factor) and all four *Anxiety* items loaded highly (.70–.83) on the first component (*Anxiety* factor).

Confirmatory Factor Analysis - The Structure of the Short Form

After performing the necessary item reversals, we tested the theoretical factor structure of the 8 items using CFA in the other randomly split subsample (n = 481). The Chi^2 -test was significant (χ^2 = 95.79, df = 19; p < .001), and all model fit indices were satisfactory (NFI = .941; TLI = .929; CFI = .952; RMSEA = .092, CI [.074 – .110]). The SRMR value (= .067) was also adequate. Consequently, the original two-factor model (Fraley et al., 2000) for the ECR-R-HU-SF in the randomly split representative community subsample of Study 1 (Figure 1) was also confirmed.

CFA was also successful when applied to the whole sample. The Chi^2 -test was significant (χ^2 = 190.587, df = 19; p < .001), and all model fit indices were satisfactory (NFI = .943; TLI = .924; CFI = .948; RMSEA = .097, CI [.085 – .110]). The SRMR value (= .064) was also adequate.

After successful item selection and factor structure validation, further psychometric analyses were performed on the entire sample (N = 958).

Figure 1. CFA Model of the ECR-R-HU-SF Structure in a Randomly Split Subsample (n = 481) of Study 1

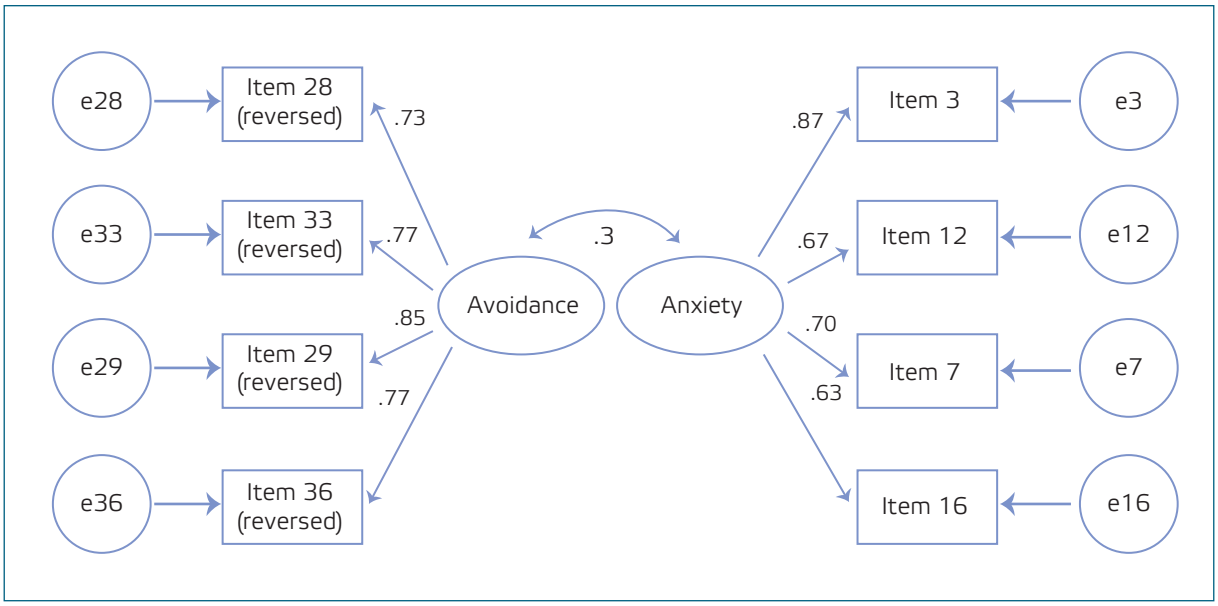


Table 3. Descriptive Statistics of the Avoidance and Anxiety Subscales in the 36-Item Long Version and the 8-Item Short Version of the ECR-R-HU

Table 3a.

ECR-R Subscales	*N*	Range	Min.	Max.	Mean	*SD*
ECR-R Avoidance - 18 items	958	4.56	1.00	5.56	2.68	1.08
ECR-R Avoidance - 4 items	958	6.00	1.00	7.00	2.65	1.38
ECR-R Anxiety - 18 items	958	5.83	1.00	6.83	2.95	1.23
ECR-R Anxiety - 4 itemsAnxiety	958	6.00	1.00	7.00	2.73	1.52

Table 3b.

		Percentiles						
ECR-R Subscales	Median	25th	50th	75th	Skewness	S.E. Skewness	Kurtosis	S.E Kurtosis
ECR-R Avoidance - 18 items	2.61	1.72	2.61	3.50	0.31	0.08	-0.75	0.16
ECR-R Avoidance - 4 items	2.50	1.50	2.50	3.75	0.70	0.08	0.00	0.16
ECR-R Anxiety - 18 items	2.83	1.94	2.83	3.83	0.49	0.08	-0.31	0.16
ECR-R Anxiety - 4 itemsAnxiety	2.50	1.25	2.50	3.81	0.69	0.08	-0.28	0.16

Relationships Between the Subscales of the 8-Item ECR-R-HU-SF and the 36-item Original Questionnaire (ECR-R-HU)

Spearman correlations of both 4-item subscales (*Avoidance, Anxiety*) proved very strong relationship with the corresponding 18-item subscales of the original questionnaire (*Avoidance*: *Rho* = .88, $p < .001$; *Anxiety*: *Rho* = .90, $p < .001$).

Internal Consistency

Both 4-item subscales demonstrated a high internal consistency; Cronbach's alpha and McDonald's omega values were both at .85 for *Avoidance* and .83 for *Anxiety*. These values were only slightly lower than those for the original 36-item questionnaire, which had Cronbach's alphas and McDonald's omegas of .91 and .92, for *Avoidance* and *Anxiety*, respectively.

Descriptive Statistics of the Avoidance and Anxiety Subscales and Relationships with the Demographic Variables

Avoidance items were all reversed items in the questionnaire; therefore, they measured the lack of *Avoidance*. As expected, after reversing the items, there was a moderate positive correlation between the two subscales (*Rho* = .42, $p < .001$).

As theoretically expected, both subscales of the short form were skewed towards lower values, indicating less anxiety and less avoidance. Since the subscale scores did not follow a normal distribution according to the Kolmogorov-Smirnov Tests ($p < .001$), we report the median and percentile values alongside the mean and standard deviation for the subscales in Table 3. This allows for a comprehensive comparison between the short 8-item questionnaire and the original 36-item version. Ensuring the alignment of the distributions and means between the two versions was a methodological requirement. Therefore, we expected that the means would not differ by more than 0.2. Although the differences were significant (Wilcoxon tests: *Avoidance:* $Z = -3.26$, $p = .001$; *Anxiety:* $Z = -10.63$, $p < .001$), the means and median values of the subscales in the original 36-item and the short form 8-item questionnaire were very similar. Based on the statistics indicating non-normal distributions, we used non-parametric tests in the subsequent analyses.

Mann-Whitney tests showed that no gender differences emerged on either scale (*Avoidance:* $Z = -.89$, $p = .371$; *Anxiety:* $Z = -1.75$, $p = .080$). There were no other noteworthy correlations between the short ECR-R-HU subscales and age (*Avoidance: Rho* = .01, $p = .850$; *Anxiety: Rho* = -.07, $p = .022$). Similarly, according to the Kruskal-Wallis tests, no significant differences manifested between the subscale means according to education (*Avoidance:* $\chi^2(3) = 1.40$, $p = .705$; *Anxiety:* $\chi^2(3) = 5.03$, $p = .170$) or type of residence (*Avoidance:* $\chi^2(2) = 1.88$, $p = .390$; *Anxiety:* $\chi^2(2) = 8.48$, $p = .786$). However, Mann-Whitney tests showed that participants who were in a relationship scored significantly

lower than single respondents on both *Avoidance: M(SD)* = 2.57(1.40) vs. *M(SD)* = 2.92(1.26), $Z = -3.97$; $p < .001$; Cohen's $d = .26$; and *Anxiety: M(SD)* = 2.56(1.45) vs. *M(SD)* = 3.33(1.59), $Z = -6.33$; $p < .001$; Cohen's $d = .42$.

Table 4. Correlations[a] of the ECR-R-HU-SF Subscales with the Validation Measures in Study 1

	Avoidance	Anxiety
FAD[b] Problem solving	.48**	.39**
FAD[b] Communications	.53**	.46**
FAD[b] Roles	.50**	.48**
FAD[b] Affective Responsiveness	.51**	.45**
FAD[b] Affective Involvement	.41**	.42**
FAD[b] Behavior Control	.24**	.24**
FAD[b] General Functioning	.56**	.50**
PSS-4[c] Perceived Stress	.32**	.41**
DS1K[c] Depressive mood	.39**	.44**
WBI-5[c] WHO Well-Being	-.31**	-.34**

[a] Values are Spearman correlation coefficients.
[b] $N = 824$, $p < .001$. [c] $N = 958$, $p < .001$.

Validation Measures

The construct (convergent) validity was examined by calculating Spearman correlations between the scores of the short ECR-R-HU subscales and measures of family functioning problems (FAD subscales), depressed mood (DS1K), perceived stress (PSS-4) and well-being (WBI-5). Both *Avoidance* and *Anxiety* were correlated systematically and moderately with all the measures of the related constructs (Table 4).

Temporal Stability

The ECR-R-HU-SF maintained the original two-factor structure (Fraley et al., 2000) in the Wave 2 subsample ($N = 98$) after a four-month gap. In CFA, the Chi-square test was significant ($\chi^2 = 24.153$, $df = 19$; $p < .001$), and all model fit indices were satisfactory (NFI = .948; TLI = .977; CFI = .988; RMSEA = .017, CI [.000 – .035]. The SRMR value (= .046) was excellent. The item weights ranged from .66 to .96 for the *Avoidance* factor and from .75 to .85 for the *Anxiety* factor, with a coefficient of .47 between the two factors.

The internal consistencies of the subscales were also high in this subsample (Cronbach's alpha and McDonald's omega values were .87 for *Avoidance* and .89 for *Anxiety*).

Spearman correlations between data from Wave 1 and Wave 2 were strong (*Avoidance*: *Rho* = .74, $p < .001$, *Anxiety*: *Rho* = .79, $p < .001$). In Wave 2, Spearman correlations between the short ECR-R-HU subscales and the 36-item questionnaire were also strong (*Avoidance*: *Rho* = .90, $p < .001$; *Anxiety*: *Rho* = .88, $p < .001$).

Although the means of the short ECR-R-HU subscale scores showed significant differences according to the Wilcoxon test in the test-retest subsample ($N = 95$), they were very similar to the means of Wave 1 after 4 months, for *Avoidance:* 2.55 (1.16) vs. 2.34 (1.27); $Z = -2.87$, $p = .004$; for *Anxiety:* 2.63 (1.47) vs. 2.39 (1.46); $Z = -2.31$, $p = .021$.

Similarly, in the Wave 2 sample ($N = 98$), statistically significant but minimal differences emerged between the original 18-item and the shortened 4-item scales, for *Avoidance:* 2.55 (1.11) vs. 2.36 (1.25); $Z = -3.48$, $p < .001$; for *Anxiety:* 2.70 (1.18) vs. 2.45 (1.49); $Z = -3.55$, $p < .001$.

Study 2

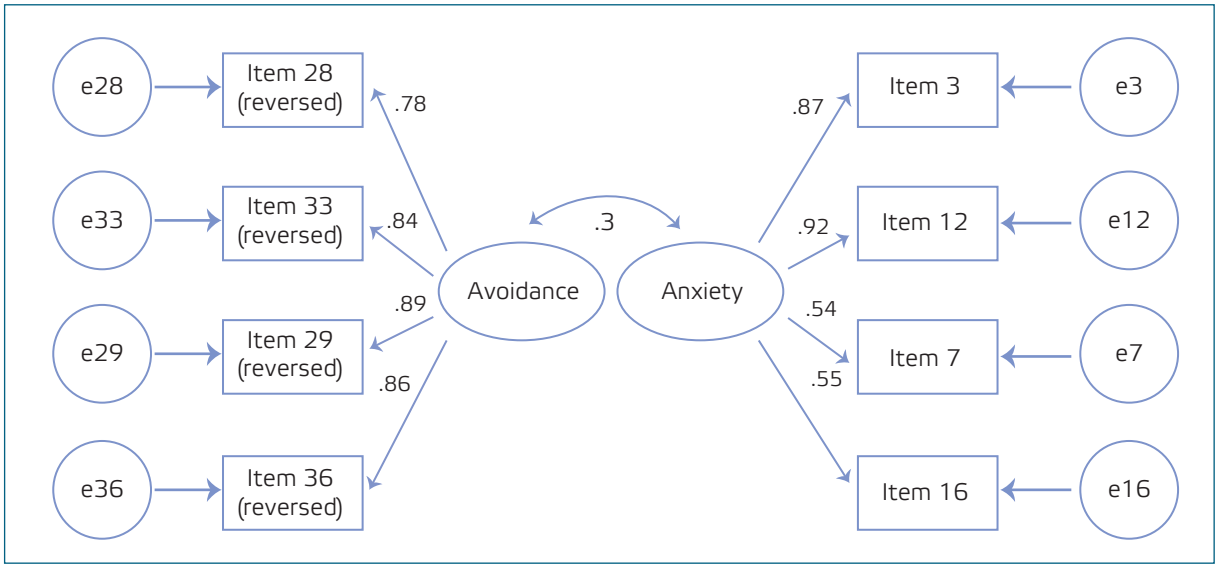
Confirmatory Factor Analysis – Structure of the Short Form in a Special Sample

A special sample of mothers of children between 3 and 36 months of age (after data imputation: $N = 952$) was used to test the theoretical two-factor structure of the short ECR-R-HU. The Chi² test was significant ($\chi^2 = 182{,}791$, $df = 19$; $p < .001$), and all other model fit indices were satisfactory (NFI = .958; TLI = .944; CFI = .962; RMSEA = .095, CI [.083 – .108]). The SRMR value (= .031) was excellent. We concluded that the original two-factor model (Fraley et al., 2000) for the short ECR-R-HU in Study 2 (Figure 2) could be confirmed.

Internal Consistency

Cronbach's alpha and McDonald's omega values were high (.91 for *Avoidance,* and .81 for *Anxiety*), showing a very good reliability of the 4-item subscales.

Figure 2. CFA Model of the ECR-R-HU-SF Structure in Study 2



Descriptive Statistics of the Avoidance and Anxiety Subscales and Relationships with Demographic Variables

Subscale scores were computed for each participant by averaging the scores of the corresponding items. The average mean scores were 2.41 (*SD* = 0.05; range: 1–7) for *Avoidance*, and 2.17 (*SD* = 0.04; range: 1–7) for *Anxiety*. Kolmogorov-Smirnov tests showed that the subscale scores did not follow a normal distribution ($p < .001$). Compared to the nationally representative sample of Study 1, the mean scores of both subscales were slightly lower in early motherhood, .24 (9%) lower for *Avoidance* and .56 (21%) lower for *Anxiety*. Both subscales were even more skewed to lower values (less avoidance and less anxiety). Therefore, we used non-parametric tests in the following analyses.

As expected, a moderate correlation was observed between the two subscales (*Rho* = .46, $p < .001$).

There was a significant difference between the mean scores of both *Avoidance* and *Anxiety* according to the participants' education level ($\chi^2(3) = 13.22$, $p = .004$ and $\chi^2(3) = 9.76$, $p = .021$, respectively) and their type of residence ($\chi^2(3) = 80.50$, $p < .001$ and $\chi^2(3) = 9.94$, $p = .019$, respectively). Pairwise comparisons found that participants with lower education (primary school or less) showed significantly higher *Avoidance* scores compared to those who completed secondary school ($p = .034$) and those who had a college or university degree ($p = .002$). Participants with a college or university degree had significantly lower *Anxiety* scores than those who only completed secondary school ($p = .049$). Those living in Budapest (capital) produced significantly lower *Avoidance* scores compared to respondents from other types of residence ($p < .001$), and *lower Anxiety scores* than those from other cities or towns ($p = .039$). It is important to note that the ratio of participants with a college degree was much higher in Budapest than in other cities and towns. The means and standard deviations are presented in Table 5, although the differences were tested by non-parametric Kruskal-Wallis tests.

Table 5. Avoidance and Anxiety Scores According to Participants' Type of Residence and Education Level in Study 2

	Residence	*N*	*M*	*SD*	Education level	*N*	*M*	*SD*
Avoidance	Village	298	2.46	1.50	Primary school or less	108	**3.02**	1.94
	City / Town	354	2.77	1.76	Skilled worker/vocational school	216	2.42	1.55
	County Seat	152	2.31	1.52	Secondary school	456	2.34	1.50
	Capital (Budapest)	149	**1.54**	.95	College, university	171	2.19	1.53
	Total	953	2.41	1.59	Total	951	2.40	1.59
Anxiety	Village	298	2.14	1.26	Primary school or less	108	2.30	1.37
	City / Town	354	2.33	1.34	Skilled worker/vocational school	216	2.26	1.37
	County seat	152	2.10	1.39	Secondary school	456	2.19	1.29
	Capital (Budapest)	149	**1.93**	1.17	College, university	171	**1.92**	1.18
	Total	953	2.17	1.30	Total	951	2.17	1.30

Single mothers (n = 52) scored significantly higher on both *Avoidance* (Z = -9.01, p < .001; M = 4.78, SD = 1.76 vs. M = 2.27, SD = 1.47; Cohen's d = .58) and *Anxiety* (Z = -1.99, p = .05; M = 2.76, SD = 1.78 vs. M = 2.14, SD = 1.26; Cohen's d = .12).

Validation Measures

The construct (convergent) validity was examined by calculating Spearman's Rho correlations of the subscale scores of the ECR-R-HU-SF with depressive mood (DS1K) and perceived stress (PSS-4). As expected, both *Avoidance* and *Anxiety* correlated moderately with depressive mood (*Avoidance*: *Rho* = .42, p < .001; *Anxiety*: *Rho* = .43, p < .001) and with perceived stress (*Avoidance*: *Rho* = .53, p < .001; *Anxiety*: *Rho* = .43, p < .001).

Discussion

The two studies described in the present article aimed to validate a methodologically rigorous short version of the Hungarian ECR-R (ECR-R-HU-SF) (Smith et al., 2000). First, we used an adequately validated long version (ECR-R-HU; Dupont et al., 2022) that used a nationally representative large-scale community sample (N = 958) for validation. To develop the short form (ECR-R-HU-SF), the same nationally representative adult sample was used for item selection and assessment of psychometric characteristics (Study 1).

The expert team paid careful attention to item selection, which was based on a combination of statistical considerations as well as aspects related to content (items with highest loadings, preference for items included in other European short forms, avoiding redundancy, coverage of content dimensions). The development of the short form (ECR-R-HU-SF) resulted in 8 items (4 for *Avoidance*, 4 for *Anxiety*) confirming the underlying dimensions of attachment-related *Avoidance* and attachment-related *Anxiety* (Fraley et al., 2000).

The *Avoidance* items measure four different content themes that mostly overlap with the themes identified by Lee et al. (2023): a) fear of intimacy (Item 29), b) reluctance to dependency (Item 33), c) reluctance to self-disclosure (Item 28), and d) belief that one is not understood by one's partner (Item 36). Three content themes were represented in the *Anxiety* subscale, which corresponded with the themes found by Lee et al. (2023): a) fear of rejection by one's partner (Item 3, 7), b) excessive need for approval from one's partner (Item 16), and c) distress from one's partner's unresponsiveness (Item 12) (Note: Item numbers correspond to Fraley et al., 2000). When comparing the items of various short versions of the ECR-R, some variance is expected due to cross-cultural differences. Two of our *Avoidance* items (27, 33) can be found in all of the reviewed short forms except in the German short versions (Brenk-Franz et al., 2018; Ehrenthal et al., 2021), while two of our *Anxiety* items (26, 32) can be found in all existing European versions; however, are not present in the Thai (Wongpakaran et al., 2023) and Korean (Lee et al., 2023) versions. We also included an item (30), which overlaps with the Thai (Wongpakaran et al., 2023) and Korean (Lee et al., 2023) brief versions, but is not present in any of the other European short forms.

The second study was a new validation of the ECR-R-HU-SF on an independent, large sample of mothers coming from diverse sociodemographic backgrounds. There is a gap in research targeting adult romantic attachment in early motherhood when attachment representations and processes become again prominent. Activation of attachment representations occurs partly due to the often chronic stress associated with this period, but also because it may evoke memories of how individuals have been cared for by their own parents during childhood (Bowlby, 1988). The mental health of mothers in this sensitive period is influenced by their romantic attachment representations (Meuti et al., 2015; Simpson & Rholes, 2019). Study 2 aims at exploring special characteristics of romantic attachment in this life phase.

The following results of Studies 1 and 2 show the high validity and reliability of the ECR-R-HU-SF: (1) The two-factor structure of the 8-item ECR-R-HU-SF was confirmed by CFAs in both studies with satisfactory model fit indices. (2) The two subscales (*Avoidance; Anxiety*) displayed very good internal consistencies with Cronbach's alphas and McDonald's omegas above .81 in both studies. (3) The subscales of the 8-item version displayed very strong correlations with those of the full 36-item version suggesting that, despite its brevity, the short version could capture the essence of the constructs (with approx. 80% common variance). (4) Temporal stability was also high in Study 1.

Further statistical parameters echoed the results of previous studies and theoretical assumptions: (1) The subscales did not follow a normal distribution in either study, and were skewed towards more secure values, as expected. (2) We also detected a moderate correlation between the two subscales in both studies, which is in line with the assumption that the two subscales are not orthogonal (Cameron et al., 2012).

The mean scores of the current representative adult sample were in the middle of the range of mean scores obtained by other short forms. Examining the mean scores of both subscales in early motherhood (Study 2), we noticed that the scores were lower, especially for *Anxiety* (9% lower for *Avoidance* and 21% lower for *Anxiety)*. A longitudinal study by Galdiolo and Roskam (2017) echoes our findings, as primiparous parents had significantly lower scores on attachment-related anxiety and avoidance compared to childless couples at the baseline measure. Contradicting their expectations, they also found that attachment orientations around childbirth showed stability pre- and post-term. One of the explanations they offer might also explain our results concerning the difference between the mean scores of mothers (Study 2) and adults (Study 1). The authors (Galdiolo & Roskam, 2017; Luhmann et al., 2014) suggested that inherent differences might manifest, (e.g., personality or attachment factors) between individuals who undergo specific events and those who do not. Our finding of lower *Avoidance* (but not *Anxiety*) levels in motherhood is also in line with a study by Rholes et al. (1997), suggesting that lower levels of attachment-related avoidance are associated with the desire to have children. However, findings of the longitudinal study conducted by Simpson et al. (2003) contradicted our results, as they suggested that in the transition to parenthood, attachment-related anxiety and avoidance did not systematically trend in a singular direction; instead, they were mediated by the women's perception of their husbands' support and anger. Changes in attachment-related avoidance seemed to be mediated by women's support seeking levels and by their partners' avoidance levels.

The most salient demographic finding consistent across both studies is that participants engaged in a relationship were more likely to have lower scores on both *Avoidance* and *Anxiety,* suggesting a trend towards more secure attachment. This could imply that individuals with more secure attachment styles are inclined to become committed in a relationship. Alternatively, the very state of being in a relationship may reduce the intense search for comfort and closeness, as the attachment system is less activated, leading individuals in a relationship to report lower-level attachment-related avoidance and anxiety in a survey targeting romantic attachment. On the other hand, respondents who are not in a committed relationship are more likely to be actively seeking an emotional bond. This quest may activate their attachment system and "prime" attachment-related distress reflected in relatively higher scores on both dimensions compared to those in committed relationships. Our findings echo results from prior studies (Ehrenthal et al., 2021; Kaščáková et al., 2016). Single participants scored significantly higher on *Avoidance* and *Anxiety* in the adult representative sample and in early motherhood as well. This is consistent with previous research using a short form of the ECR-R (Ehrenthal et al., 2021) and partially consistent with the results from the Czech representative sample (Kaščáková et al., 2016), in which single participants had significantly higher avoidance scores.

Results concerning relationship status in early motherhood were similar and even accentuated for *Avoidance*. The average *Avoidance* score of single mothers was more than twice the *Avoidance* score of mothers in a relationship. In the case of *Anxiety,* a significant difference appeared between the scores of single mothers and mothers in a relationship, but the difference was not as great as for *Avoidance*. Attachment avoidance is associated with cognitive, affective and behavioral processes hindering the potential for intimacy (Simpson & Campbell, 2013). Accordingly, individuals with high avoidance are less likely to form committed romantic relationships (Schindler et al., 2010) and engage in new relationships following a break-up (Davis et al., 2003), and may tend to avoid relationships in general as a result of anticipated relationship disappointments and commitment aversion (Birnie et al., 2009). Bowlby (1988) believed that transition to parenthood provides a fertile ground for changes in attachment orientations, because of (1) the chronically stressful nature of having a child, (2) the reactivation of attachment-related memories from the past, (3) and also because caring for a baby exposes individuals to new personal and interpersonal experiences, which may either contradict or substantiate existing attachment working models. Simpson et al. (2003) confirm that attachment orientations do change in meaningful ways during the transition to parenthood and these changes are related to how individuals perceive themselves and their partners. Single mothers continue to perceive themselves and their social worlds in ways that actively justify their insecurity. Sharp increases in avoidance levels of single mothers echo the finding that women who enter parenthood seeking less spousal support or who have highly avoidant husbands tend to become more avoidant during the transition (Simpson & Rholes, 2019).

There were no gender differences for either scale in Study 1, which is consistent with the fact that short ECR-R versions have mostly confirmed invariance across gender groups (Brenk-Franz et al., 2018; Ehrenthal et al., 2021; Kaščáková et al., 2016; Švecová et al., 2021; Wongpakaran et al., 2023; Wongpakaran & Wongpakaran, 2012). Subscale scores did not show significant differences according to age, education, or type of residence in Study 1. In Study 2, mothers with lower education (8 years or less) had significantly higher *Avoidance* scores than mothers who completed secondary education or had a college or university degree. This is in line with the findings of

Kaščáková et al. (2016), namely that significantly lower avoidance scores were associated with higher educational levels. However, research on the relationship between romantic attachment and educational levels using the ECR-R and its short versions is lacking. Some studies have shown that attachment representations influence students' academic performance: secure attachment has been associated not only with higher grades, but with greater emotional regulation, social competence and willingness to take challenges (Bergin & Bergin, 2009; Moss & St-Laurent, 2001). Reio et al. (2009) have shown that secure attachment has a positive influence on learning-related outcomes.

We also found significant differences in attachment representations according to type of residence in Study 2. Individuals residing in Budapest (the capital) had a lower average score on both subscales compared to other residential areas (county seats, other cities/towns, villages) with varying levels of significance across groups. However, a greater proportion of participants from Budapest had completed college or university, which may have influenced the differences observed based on type of residence. To our knowledge, limited research exists addressing the connection between types of residence and attachment styles.

ECR-R-HU-SF subscales (*Avoidance; Anxiety*) correlated in the expected directions with related constructs, such as family functioning problems, depressive mood, perceived stress, and well-being in Study 1. Study 2 further confirmed the convergent validity of the two subscales on an independent sample: *Avoidance* and *Anxiety* showed positive correlations with depressive mood and perceived stress. Recent research supports our findings concerning the link between attachment insecurity and perceived stress (Thompson et al., 2018), while Conradi et al. (2018) identified a connection between insecure attachment styles and a more depressed mood. Conradi et al. (2018) indicated that insecure attachment had an adverse effect on the course of depression in primary care patients over a seven-year period. According to Jansen et al. (2023), insecure attachment correlated with higher levels of stress and depression in a student sample. Family functioning problems were closely tied to couple dynamics and marital satisfaction. The latter was associated with attachment-related *Avoidance* and *Anxiety* in earlier studies (Mikulincer & Shaver, 2016; Treboux et al., 2004). The link between attachment security and well-being was also highlighted in recent research. It appears that attachment security contributes to happiness (Diener & Seligman, 2002), while higher levels of attachment insecurity are associated with lower levels of psychological well-being mediated by dispositional mindfulness, psychological inflexibility, and resilience (Calvo et al., 2022). In summary, each measure that was chosen to test convergent validity affirmed the anticipated associations with the two attachment dimensions: *Avoidance* and *Anxiety*.

Strengths and Limitations

This study reports the validation of the Hungarian short version of the ECR-R (ECR-R-HU-SF). The psychometric assessment of the measure and item selection was based on data from a nationally representative community sample, offering greater heterogeneity than other validation studies. The item selection was meticulously carried out in a randomly split subsample of Study 1 and was based on a variety of aspects including coverage of thematic dimensions, statistical considerations and consideration of items included in other European short versions of the ECR-R. The resulting 8 items (4 for *Avoidance*, 4 for *Anxiety*) of the ECR-R-HU-SF confirmed the original two-factor structure of the measure in the other randomly split subsample of Study 1. The subscales (*Avoidance; Anxiety*) showed very good reliability and correlated highly with their corresponding original long versions. The newly developed ECR-R-HU-SF was tested on a special representative sample of mothers of children between 3 and 36 months of age (Study 2). The psychometric analysis of the second database confirmed the results in Study 1. In summary, we can conclude that the ECR-R-HU-SF can be used as an effective screening tool for measuring adult romantic attachment.

The greatest strength of our manuscript is that in creating a highly valid and reliable short form measure of the ECR-R in Hungarian, we adhered to methodological rigor in data collection, sampling, and data analysis.

In addition to the strengths of the research, several limitations must be considered when interpreting the results, which should be addressed in future studies:

1. Validation results were obtained through self-report questionnaires and might be biased by the common-method variance.

2. In the short form, all of the *Avoidance* items are reversed items, thus measuring the absence of avoidance (all items must be reversed when scoring the questionnaire). However, the correlation between the subscales of the full and the shortened questionnaire is extremely high, which supports our argument for further use of this item set. Since the main component of Avoidance in PCA contained reversed items, and in our previous paper

(Dupont et al., 2022) we experienced the confounding effect of mixed-direction items on pure factor structures, we decided to select items oriented in a single direction.

3. Our specialized independent sample (Study 2) for testing the validity of the instrument consisted solely of mothers. Therefore, the validity measures of the short scales in Study 2 are limited to this specific demographic group.

4. As the ECR-R is one of the most comprehensive and reliable instruments in the literature to test romantic attachment, we did not test its concurrent validity in our studies; only convergent validity measures were introduced.

Conclusion, Implications, and Future Directions

The ECR-R-HU-SF serves as a highly valid and reliable instrument for large-scale research particularly when there is a constraint on the number of items per tool. Its utility extends to the clinical realm (e.g., systemic family therapy, couples counseling, perinatal interventions), where it can be used for quick screening or facilitate evaluations and consistent monitoring throughout therapeutic processes. Highlighting the use of short forms in the clinical field, a recent study has demonstrated that national short forms of the ECR-R in Germany exhibit strict longitudinal measurement invariance and sensitivity to treatment (Müller et al. 2024). Hungarian researchers and clinicians working in the field of attachment gain an 8-item, time-saving instrument that has been developed on a representative community sample.

Future research should investigate whether the short *Avoidance* scale effectively captures the latent construct and the full continuum of the latent dimension. As mentioned earlier, all the *Avoidance* items are reversed, measuring the absence of avoidance. Further independent samples (even specialized samples) should be considered to test the validity and reliability of the instrument. Several Hungarian large samples are already available for analyses including several hundred mental health professionals trained in EFT couple therapy and multiple dyads (partners) in intervention studies. We plan to analyze these samples and publish our results in the future. Additionally, future research should examine the concurrent validity of the Hungarian ECR-R and its short form, as this has not yet been addressed.

Future research might also consider further investigation of underlying factors associated with lower attachment insecurity in early motherhood, but also higher avoidance levels in single mothers.

Considerations on cross-cultural validity frequently led to the choice of diverse items for short form validation procedures; however, countries sharing a similar cultural background within the same region might aim for congruence.

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Author contribution

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Declaration of interest statement
The authors have no conflicts of interest to disclose.

Ethical statement
This manuscript is the authors' original work.
All participants engaged in the research voluntarily and anonymously.
Their data are stored in coded materials and databases without personal data.
Studies were approved by the Research Ethics Committee of Semmelweis University Budapest, Hungary. The license number for Study: RKEB 197/2018, for Study 2: RKEB 240/2019.

Data availability statement
The data that support the findings of this study are available in figshare at https://figshare.com/s/d04ef25a1c48a273b599.

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References

Avsar, A. S. (2022). Comparing the automatic item selection procedure and exploratory factor analysis in determining factor structure. *Participatory Educational Research*, *9*(2), 416–436. https://doi.org/10.17275/per.22.47.9.2

Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: A test of a four-category model. *Journal of Personality and Social Psychology*, *61*(2), 226–244. https://doi.org/10.1037//0022-3514.61.2.226

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, *4*(6), 561–571. https://doi.org/10.1001/archpsyc.1961.01710120031004

Bergin, C., & Bergin, D. (2009). Attachment in the classroom. *Educational Psychology Review*, *21*(2), 141–170. https://doi.org/10.1007/s10648-009-9104-0

Birnie, C., Joy McClure, M., Lydon, J. E., & Holmberg, D. (2009). Attachment avoidance and commitment aversion: A script for relationship failure. *Personal Relationships*, *16*(1), 79–97. https://doi.org/10.1111/j.1475-6811.2009.01211.x

Booth-LaForce, C., & Roisman, G. I. (2014). The adult attachment interview: Psychometrics, stability and change from infancy, and developmental origins: I. Introduction. *Monographs of the Society for Research in Child Development*, *79*(3), 1–14. https://doi.org/10.1111/mono.12110

Bowlby, J. (1969/1982). *Attachment and loss: Vol. 1. Attachment.* Basic Books.

Bowlby, J. (1973). *Attachment and loss: Vol. 2. Separation: anxiety and anger*. Basic Books.

Bowlby, J. (1988). *A secure base: Parent-child attachment and healthy human development*. Basic Books.

Brenk-Franz, K., Ehrenthal, J., Freund, T., Schneider, N., Strauß, B., Tiesler, F., Schauenburg, H., & Gensichen, J. (2018). Evaluation of the short form of "Experience in Close Relationships" (Revised, German Version "ECR-RD12") - A tool to measure adult attachment in primary care. *PLoS One*, *13*(1), Article e0191254. https://doi.org/10.1371/journal.pone.0191254

Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: An integrative overview. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46–76). The Guilford Press.

Browne, M. W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods & Research, 21*(2), 230 – 258. https://doi.org/10.1177/0049124192021002005

Calvo, V., D'Aquila, C., Rocco, D., & Carraro, E. (2022). Attachment and well-being: Mediatory roles of mindfulness, psychological inflexibility, and resilience. *Current Psychology*, *41*(5), 2966–2979. https://doi.org/10.1007/s12144-020-00820-2

Cameron, J. J., Finnegan, H., & Morry, M. M. (2012). Orthogonal dreams in an oblique world: A meta-analysis of the association between attachment anxiety and avoidance. *Journal of Research in Personality*, *46*(5), 472–476. https://doi.org/10.1016/j.jrp.2012.05.001

Chistopolskaya, K. A., Mitina, O. V., Enikolopov, S., Nikolaev, E., Semikin, G. I., Chubina, S. A., Ozol, S., & Drovosekov, S. (2018). Adaptation on a Russian sample of the short version of Experience in Close Relationships-Revised Questionnaire. *Psikhologicheskii Zhurnal*, *39*(5), 87–98. https://doi.org/10.31857/S020595920000838-7

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health Social Behavior*, *24*(4), 385–396. https://doi.org/10.2307/2136404

Conradi, H. J., Kamphuis, J. H., & de Jonge, P. (2018). Adult attachment predicts the seven-year course of recurrent depression in primary care. *Journal of Affective Disorders*, *225*, 160–166. https://doi.org/10.1016/j.jad.2017.08.009

Danis, I., Bóné, V., Hegedüs, R., Pilinszky, A., Szabó, T., & Dávid, B. (2020). Infancy in 21st century Hungary – A project introduction: Policy, theoretical and methodological framework and objectives of the first national representative parent survey on infant and early childhood mental health. *European Journal of Mental Health*, *15*(2), 111–144. https://doi.org/10.5708/EJMH.15.2020.2.3

Danis, I., Gervai, J., Tóth, I., Kurimay, T., & Török, S. (2022, September 7–10). *Validation and psychometric properties of the Family Assessment Device in Hungary* [Poster Presentation]. 11th Conference of the European Family Therapy Association - Systemic Resonances and Interferences, Ljubljana, Slovenia.

Danis, I. Lakatos, K., Ney, K., Tóth, I., & Gervai, J. (2005). A szölői és a tágabb családi környezet kérdőíves vizsgálatának lehetőségei [Measuring parental and broader family environment by questionnaires]. *Alkalmazott Pszichológia*, *7*, 59–74.

Davis, D., Shaver, P. R., & Vernon, M. L. (2003). Physical, emotional, and behavioral reactions to breaking up: The roles of gender, age, emotional involvement, and attachment style. *Personality and Social Psychology Bulletin*, *29*(7), 871–884. https://doi.org/10.1177/0146167203029007006

Diener, E., & Seligman, M. E. P. (2002). Very happy people. *Psychological Science*, *13*(1), 81–84. https://doi.org/10.1111/1467-9280.00415

Doll, E. A. (1917). A Brief Binet-Simon Scale. *Psychological Clinic*, *11*(7), 197–211.

Dupont, K., Gervai, J., Danis, I., Tóth, I., Koren, R., & Török, S. (2022). Factor structure, psychometric properties, and validation of the Hungarian version of the Experiences in Close Relationships Revised (ECR-R-HU) Questionnaire in a nationally representative community sample. *Journal of Personality Assessment*, *104*(6), 747–758. https://doi.org/10.1080/00223891.2021.2019054

Dupont, K., Gervai, J., Tóth, I., Török, Sz., Danis, I. (2023a, March 30- April 1). *Measuring adult romantic attachment in Hungary. The Hungarian short version of the Experiences in Close Relationships-Revised (ECR-R-HU): Results of a nationally representative community sample* [Poster presentation]. 31st World Family Therapy Congress. Malaga, Spain.

Dupont, K., Török, Sz., Gervai, J., Tóth, I., Danis, I. (2023b, July 15-19). *Validation of the Hungarian short ECR-R among mothers of infants in a nationally representative sample* [Poster presentation]. 18th World Congress for the World Association for Infant Mental Health, Dublin, Ireland.

Ehrenthal, J. C., Zimmermann, J., Brenk-Franz, K., Dinger, U., Schauenburg, H., Brähler, E., & Strauß, B. (2021). Evaluation of a short version of the Experiences in Close Relationships-Revised Questionnaire (ECR-RD8): Results from a representative German sample. *BMC Psychology*, *9*(1), Article 140. https://doi.org/10.1186/s40359-021-00637-z

Epstein, N. B., Baldwin, L. M., & Bishop, D. S. (1983). The McMaster Family Assessment Device. *Journal of Marital and Family Therapy*, *9*(2), 171–180. https://doi.org/10.1111/j.1752-0606.1983.tb01497.x

Esbjørn, B. H., Breinholst, S., Niclasen, J., Skovgaard, L. F., Lange, K., & Reinholdt-Dunne, M. L. (2015). Identifying the best-fitting factor structure of the Experience of Close Relations -Revised in a Scandinavian example. *PLoS One*, *10*(9), Article e0137218. https://doi.org/10.1371/journal.pone.0137218

Fairchild, A. J., & Finney, S. J. (2006). Investigating validity evidence for the Experiences in Close Relationships-Revised Questionnaire. *Educational and Psychological Measurement*, *66*(1), 116–135. https://doi.org/10.1177/0013164405278564

Fraley, R. C., Heffernan, M. E., Vicary, A. M., & Brumbaugh, C. C. (2011). The experiences in close relationships – Relationship Structures Questionnaire: A method for assessing attachment orientations across relationships. *Psychological Assessment*, *23*(3), 615–625. https://doi.org/10.1037/a0022898

Fraley, R. C., Waller, N. G., & Brennan, K. A. (2000). An item response theory analysis of self-report measures of adult attachment. *Journal of Personality and Social Psychology*, *78*(2), 350–365. https://doi.org/10.1037/0022-3514.78.2.350

Galdiolo, S., & Roskam, I. (2017). Development of attachment orientations in response to childbirth: A longitudinal dyadic perspective. *Personality and Individual Differences*, *108*, 136–143. https://doi.org/10.1016/j.paid.2016.12.016

Gervai, J., Dupont, K., Tóth, I., Török, S., & Danis, I. (2019). Tapasztalatok szoros kapcsolatokban kérdőív – átdolgozott, rövidített változat (ECR-R-HU-SF) [The short form of the Hungarian version of the Experiences in Close Relationships – Revised (ECR-R-HU-SF)]. The Hungarian translation manuscript. https://www.ttk.hun-ren.hu/kpi/wp-content/uploads/sites/4/2024/09/Tapasztalatok-Szoros-Kapcsolatokban-rovid-valtozat-ECR-R-HU-SF.pdf

Gervai, J., Tóth, I., Török, S., Koren, R., & Danis, I. (2018). Tapasztalatok szoros kapcsolatokban kérdőív - átdolgozott változat (ECR-R-HU) [The Hungarian version of the Experiences in Close Relationships – Revised version (ECR-R-HU)]. The Hungarian translation manuscript. https://www.ttk.hun-ren.hu/wp-content/uploads/kpi-modszer/Tapasztalatok_Szoros_Kapcsolatokban_ECR-R-HU.pdf

Graham, J. M., & Unterschute, M. S. (2015). A reliability generalization meta-analysis of self-report measures of adult attachment. *Journal of Personality Assessment*, *97*(1), 31–41. https://doi.org/10.1080/00223891.2014.927768

Halmai, Z., Dömötör, E., Balogh, G., Sárosi, A., Faludi, G., Székely, A. (2008). Egy új hangulati kérdőív validálása egészséges mintán [Validation of a new mood questionnaire on healthy sample]. *Neuropsychopharmacologia Hungarica*, *10*(3), 151–157.

Hamilton, E., & Carr, A. (2016). Systematic review of self-report family assessment measures. *Family Process*, *55*(1), 16–30. https://doi.org/10.1111/famp.12200

Hanak, N., & Dimitrijevic, A. (2013). A Serbian version of modified and revised Experiences in Close Relationships Scale (SM-ECR-R). *Journal of Personality Assessment*, *95*(5), 530–538. https://doi.org/10.1080/00223891.2013.778271

Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology*, *52*(3), 511–524. https://doi.org/10.1037//0022-3514.52.3.511

Hind, B., Soussi Noufail, O. (2022). Principal component analysis applied to survey data: Methodological aspects and application. *International Journal on Optimization and Applications*, *2*(2), 25–33.

Hu, L.-t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Jansen, N., Kühl, J., Eller, N., Kingdon, P., & Firk, C. (2023). Mentalizing capacity partially mediates the relationship between attachment and stress, depression, and anxiety in social work students. *Clinical Social Work Journal, 51,* 339–353. https://doi.org/10.1007/s10615-023-00882-2

Kaščáková, N., Husárová, D., Hašto, J., Kolarčik, P., Poláčková Šolcová, I., Madarasová Gecková, A., & Tavel, P. (2016). Validation of a 16-item short form of the Czech version of the Experiences in Close Relationships Revised Questionnaire in a representative sample. *Psychological Reports*, *119*(3), 804–825. https://doi.org/10.1177/0033294116667725

Kim, S.-H., Sherry, A. R., Lee, Y.-S., & Kim, C.-D. (2011). Psychometric properties of a translated Korean adult attachment measure. *Measurement and Evaluation in Counseling and Development*, *44*(3), 135–150. https://doi.org/10.1177/0748175611409842

Kumar, R. M. (2022). Assessing the psychometric properties of Hindi version of Experiences in Close Relationships – Revised (ECR-R) Scale. *Indian Journal of Forensic Medicine & Toxicology*, *16*(4), 402–406. https://doi.org/10.37506/ijfmt.v16i4.18651

Lee, J.-y., Kim, Y.-K., & Shin, Y.-J. (2023). Validation of the Korean version of Culturally Responsive Experiences in Close Relationships–Short Form. *International Journal for the Advancement of Counselling*, *45*(1), 57–81. https://doi.org/10.1007/s10447-023-09503-6

Lubiewska, K., Głogowska, K., Mickiewicz, K., Wojtynkiewicz, E., Izdebski, P., & Wiśniewski, C. (2016). Skala Experience in Close Relationships-Revised: Struktura, rzetelność oraz skrócona wersja skali w polskiej próbie. *Psychologia Rozwojowa*, *21*(1), 49–63. https://doi.org/10.4467/20843879PR.16.004.4793

Luhmann, M., Orth, U., Specht, J., Kandler, C., & Lucas, R. E. (2014). Studying changes in life circumstances and personality: It's about time. *European Journal of Personality, 28*(3), 256–266. https://doi.org/10.1002/per.1951

Meuti, V., Aceti, F., Giacchetti, N., Carluccio, G. M., Zaccagni, M., Marini, I., Giancola, O., Ciolli, P., & Biondi, M. (2015). Perinatal depression and patterns of attachment: A critical risk factor? *Depression Research and Treatment*, *2015*, Article 105012. https://doi.org/10.1155/2015/105012

Mikulincer, M., & Shaver, P. R. (2016). *Attachment in adulthood: Structure, dynamics and change.* (2nd ed.). The Guilford Press.

Moss, E., & St-Laurent, D. (2001). Attachment at school age and academic performance. *Developmental Psychology*, *37*(6), 863–874. https://doi.org/10.1037//0012-1649.37.6.863

Müller, S., Spitzer, C., Flemming, E., Ehrenthal, J. C., Mestel, R., Strauß, B., & Lübke, L. (2024). Measuring change in attachment insecurity using short forms of the ECR-R: Longitudinal measurement invariance and sensitivity to treatment. *Journal of Personality Assessment*, *106*(2), 218–229. https://doi.org/10.1080/00223891.2023.2238816

Ravitz, P., Maunder, R., Hunter, J., Sthankiya, B., & Lancee, W. (2010). Adult attachment measures: A 25-year review. *Journal of Psychosomatic Research*, *69*(4), 419–432. https://doi.org/10.1016/j.jpsychores.2009.08.006

Reio, T. G., Marcus, R. F., & Sanders-Reio, J. (2009). Contribution of student and instructor relationships and attachment style to school completion. *The Journal of Genetic Psychology*, *170*(1), 53–72. https://doi.org/10.3200/GNTP.170.1.53-72

Rholes, W. R., Simpson, J. A., Blakely, B. S., Lanigan, L., & Allen, E. A. (1997). Adult attachment styles, the desire to have children, and working models of parenthood. *Journal of Personality*, *65*(2), 357-385. https://doi.org/10.1111/j.1467-6494.1997.tb00958.x

Rotaru, T.-Ş., & Rusu, A. (2013). Psychometric properties of the Romanian version of Experiences in Close Relationships-Revised Questionnaire (ECR-R). *Procedia - Social and Behavioral Sciences*, *78*, 51–55. https://doi.org/10.1016/j.sbspro.2013.04.249

Schindler, I., Fagundes, C. P., & Murdock, K. W. (2010). Predictors of romantic relationship formations: Attachment style, prior relationships, and dating goals. *Personal Relationships*, *17*(1), 97–105. https://doi.org/10.1111/j.1475-6811.2010.01255.x

Schreiber, J. B. (2021). Issues and recommendations for exploratory factor analysis and principal component analysis. *Research in Social and Administrative Pharmacy, 17*(5), 1004–1011. https://doi.org/10.1016/j.sapharm.2020.07.027

Simpson, J. A., & Campbell, L. (Eds.). (2013). *The Oxford handbook of close relationships.* Oxford University Press. https://doi.org/10.1093/oxfordhb/9780195398694.001.0001

Simpson, J. A., & Rholes, W. S. (2019). Adult attachment orientations and well-being during the transition to parenthood. *Current Opinion in Psychology*, *25*, 47–52. https://doi.org/10.1016/j.copsyc.2018.02.019

Simpson, J. A., Steven Rholes, W., Campbell, L., & Wilson, C. L. (2003). Changes in attachment orientations across the transition to parenthood. *Journal of Experimental Social Psychology*, *39*(4), 317–331. https://doi.org/10.1016/S0022-1031(03)00030-1

Smith, G. T., & McCarthy, D. M. (1995). Methodological considerations in the refinement of clinical assessment instruments. *Psychological Assessment*, *7*(3), 300–308. https://doi.org/10.1037/1040-3590.7.3.300

Smith, G. T., McCarthy, D. M., & Anderson, K. G. (2000). On the sins of short-form development. *Psychological Assessment*, *12*(1), 102–111. https://doi.org/10.1037//1040-3590.12.1.102

Staccini, L., Tomba, E., Grandi, S., & Keitner, G. I. (2015). The evaluation of family functioning by the family assessment device: A systematic review of studies in adult clinical populations. *Family Process*, *54*(1), 94–115. https://doi.org/10.1111/famp.12098

Stauder, A., & Konkolÿ Thege, B. (2006). Az észlelt stressz kérdőív (PSS) magyar verziójának jellemzői [Characteristics of the Hungarian version of the Perceived Stress Scale (PSS)].

Mentalhigiéné és Pszichoszomatika, *7*(3), 203–216. https://doi.org/10.1556/Mental.7.2006.3.4

Susánszky, É., Konkoly-Thege, B., Stauder, A., & Kopp, M. (2006). A WHO Jól-lét Kerdőív rövidített (WBI-5) magyar változatának validálása a Hungarostudy 2002 országos lakossági egészségfelmérés alapján [Validation of the short (5-item) version of the WHO Well- Being Scale based on a Hungarian representative health survey, Hungarostudy 2002]. *Mentalhigiéné és Pszichoszomatika*, *7*(3), 247–255. https://doi.org/10.1556/Mental.7.2006.3.8

Švecová, J., Kaščáková, N., Fürstová, J., Hašto, J., & Tavel, P. (2021). Validation of the 14-item short form of the Slovak version of the Experiences in Close Relationships Revised Questionnaire. Československá Psychologie, *65*(2), 146–162. https://doi.org/10.51561/cspsych.65.2.146

Thompson, G., Wrath, A., Trinder, K., & Adams, G. C. (2018). The roles of attachment and resilience in perceived stress in medical students. *Canadian Medical Education Journal*, *9*(4), e69–e77.

Topp, C. W., Østergaard, S. D., Søndergaard, S., & Bech, P. (2015). The WHO-5 Well-Being Index: A systematic review of the literature. *Psychotherapy and Psychosomatics*, *84*(3), 167–176. https://doi.org/10.1159/000376585

Treboux, D., Crowell, J. A., & Waters, E. (2004). When "new" meets "old": Configurations of adult attachment representations and their implications for marital functioning. *Developmental Psychology*, *40*(2), 295–314. https://doi.org/10.1037/0012-1649.40.2.295

Wei, M., Russell, D. W., Mallinckrodt, B., & Vogel, D. L. (2007). The Experiences in Close Relationship Scale (ECR)-Short Form: Reliability, validity, and factor structure. *Journal of Personality Assessment*, *88*(2), 187–204. https://doi.org/10.1080/00223890701268041

WHO (1998). *Wellbeing measures in primary health care / the DepCare Project: Report on a WHO meeting: Stockholm, Sweeden, 12–13 February 1998*. WHO Regional Office for Europe. https://iris.who.int/handle/10665/349766

Wilkinson, R. B. (2011). Measuring attachment dimensions in adolescents: Development and validation of the Experiences in Close Relationships – Revised – General Short Form. *Journal of Relationships Research, 2*(1), 53–62. https://doi.org/10.1375/jrr.2.1.53

Wongpakaran, N., Wongpakaran, T., Lerttrakarnnon, P., Jiraniramai, S., Saisavoey, N., Tantrarungroj, T., Satthapisit, S., DeMaranville, J., Myint, K. M., & Wedding, D. (2023). Psychometric assessment of the 10-item, revised experience of close relationship (ECR-R-10) in nonclinical and clinical populations of adults and older adults in Thailand. *Scientific Reports*, *13*, Article 14969. https://doi.org/10.1038/s41598-023-41306-y

Wongpakaran, T., & Wongpakaran, N. (2012). A short version of the revised 'Experience of Close Relationships Questionnaire': Investigating non-clinical and clinical samples. *Clinical Practice and Epidemiology in Mental Health, 8*, 36–42. https://doi.org/10.2174/1745017901208010036

Wongpakaran, T., Wongpakaran, N., & Wannarit, K. (2011). Validity and reliability of the Thai version of the Experiences of Close Relationships-Revised Questionnaire. *Singapore Medical Journal*, *52*(2), 100–106.

Zigmond, A. S., & Snaith, R. P. (1983). The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica*, *67*(6), 361–370. https://doi.org/10.1111/j.1600-0447.1983.tb09716.x

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RESEARCH ARTICLE

Media-Induced Secondary Traumatic Stress: The Case of the Kahramanmaras Earthquake in Turkey

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Introduction: Trauma manifests in a variety of ways and disrupts the lives of individuals. This is particularly the case in an age when communication technologies are permeating everyday practices, and media is an essential means of communication. A review of the international literature on disasters reveals that the measurement tools used in the research on the association between Secondary Traumatic Stress (STS) and the media are limited.
Aims: The main aim of this study is to measure the STS levels in the audience of the media content regarding the Kahramanmaras-centered earthquake and to examine the factors associated with it.
Methods: First, a measurement tool on the subject was developed, and then its psychometric properties were investigated. Exploratory factor analysis, confirmatory factor analysis, validity, and reliability analyses were conducted throughout the studies (N = 30 for Study I; N = 265 for Study II; N = 283 for Study III).
Results: A 17-item, four-factor (intrusion, anxiety, media distrust, and avoidance), valid and reliable scale was created. Moreover, depression was found to have a partial mediating effect on the significant relationship between media exposure related STS and psychological well-being (β = –.22, SE = .027, 95% CI [–.25, –.19]).
Conclusions: The results revealed the multi-dimensional impact of STS on people indirectly exposed to trauma as well as the uniqueness of the scale.

Keywords: secondary traumatic stress, media, earthquake, interdisciplinarity, media psychology.

Introduction

The American Psychological Association (n.d., para 1.) defines the concept of trauma as "an emotional response to a terrible event like an accident, crime, natural disaster, physical or emotional abuse, neglect, experiencing or witnessing violence, death of a loved one, war, and more." Herman (1997), on the other hand, defines trauma as a response to an event that leads to a deterioration of life harmony and inadequate coping skills. In addition, Van der Kolk (2015) defines the concept of trauma as the psychological result of destructive and stressful events that disrupt an individual's coping strategies toward a problem. A potentially serious injury or threat to life can be defined as trauma. In addition, several other events that cause the person to develop various negative symptoms can be considered trauma.

Experienced or witnessed traumatic events cause people to develop a range of symptoms and disorders. In the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013), trauma-related disorders are assessed under the diagnosis of Post-Traumatic Stress Disorder

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(PTSD). The common denominator of the disorders under this heading is the potential for a traumatic or stressful event in the person's past to influence the onset of symptoms (Morrison, 2014). This implies that the person was unable to maintain their homeostatic order after the traumatic event to which they were somehow exposed, and they exhibited pathological reactions because their psychological balance was disturbed. To go deeper, according to the DSM-5, the diagnosis of PTSD involves a *stressor* (either directly experiencing or witnessing a trauma in person, or an indirect exposure through the experiences of a relative or close friend, or through professional duties) (criterion A), the *involuntarily re-experience* of the traumatic event (criterion B), *avoidance of or efforts to avoid* trauma-related thoughts, feelings or the reminders of the traumatic event(s) (criterion C), to focus on *negative beliefs, expectations* or *cognitions* or to *dissociate* (criterion D), and to have *physiological* and *emotional reactions* (e.g. anxious feelings, difficulty concentrating or sleeping) related to this (criterion E) (American Psychiatric Association, 2013).

Although PTSD symptoms are usually related to a direct experience of the traumatic event, this may not be the case in all instances of trauma. Figley (1998) defines "Secondary Traumatic Stress (STS)" as an individual's behavioral and emotional reactions, resulting from witnessing stressful events experienced by significant others. Stress in this sense results from caring for, helping, or wanting to help the traumatized person (Dirkzwager et al., 2005). As Figley (1995) argues, in the case of primary exposure, the perceived threat is in a personal position. In the case of secondary exposure, however, it may be related to the lives of people he knows or encounters through his work, rather than to the person himself. It has been suggested that the negative effects of secondary traumatic stress can have similar outcomes to PTSD and that individuals can have almost the same reactions (Bride et al., 2007). A person who has been exposed to a traumatic event at a secondary level may feel uncomfortable, or depressed, have problems concentrating, or exhibit some avoidant behaviors through remembering the experience of the person at the center of the traumatic event (Figley, 1995; 1998). There may also be a reduced sense of hope for the future, excessive reactions to stimuli, outbursts of anger, or irritability. As a result, secondary exposure can be as distressing as primary exposure (Figley, 1998).

Some studies evaluating the prevalence and characteristics of secondary traumatic stress can be mentioned in the literature. For example, the survey by Bride et al. (2009) assessed the levels of PTSD symptoms and STS levels in 225 substance abuse counselors. As a result of the research, counselors frequently exhibited STS symptoms while working with traumatized populations; with almost half of them experiencing intrusive thoughts. A study (Hatcher et al., 2011) included 118 juvenile justice teachers who provide education to incarcerated children. When asked to assess the students they worked with for the effects of the traumatic events they had experienced, the experts reported that 47% of the students had moderate traumatic symptoms, 27% were severely and 7% were severely traumatized. In terms of the teachers' STS symptoms, it was observed that 81% of the participants met at least one of the PTSD criteria, 55% met at least two, and 39% met all of them. Another study conducted in Australia, surveyed 412 professionals supporting clients with alcohol or other drug addiction and found STS in 20% of the participants (Ewer et al., 2015). To give examples from Turkish literature, Kahil and Palabıyıkoğlu's (2018) research aimed to examine the STS levels of 228 professional and volunteer aid workers; as a result of the study, it was found that the STS levels of the professionals were higher than those of the volunteers and that the STS symptoms increased as the duration of their occupation increased. In the review study by Yanbolluoğlu (2019), it was determined that the level of STS varies according to sociodemographic background and may be related to individual factors such as coping skills or burnout. In addition, it was determined that the level of STS increased with experience and was higher in specialists with an individual trauma history.

The disruption of the life cycle and routines of individuals following a traumatic event carries the risk of negative attitudes and behaviors. Depressive disorders that may occur in this context are symptoms that persist for a certain period and may harm people's functionality (Curry & Reinecke, 2003). Depression may include a single negative emotion, accompanying symptoms, or a psychiatric disorder. People may be prone to these negative symptoms when they are indirectly exposed to a traumatic situation. However, a review of the literature reveals that the studies on these relationships are limited. For example, a study by Ariapooran et al. (2022) revealed that STS was associated with depression, anxiety and suicidal ideation in nurses. Another study (Perstling & Rothmann, 2012) found a significant and negative correlation between secondary traumatic stress and psychological well-being.

Most of the previously mentioned studies used the Secondary Traumatic Stress Scale (STSS), developed by Bride et al. (2004) to measure STS with three subscales: intrusion, arousal and avoidance symptoms. The Secondary Trauma Questionnaire (STQ), developed by Motta et al. (2001), is also a tool used to measure symptoms of secondary trauma. These scales mostly examine the stress that professionals working with traumatized groups develop; on the other hand, secondary traumatic stress may not only be seen in these people. There is also the possibility that any person may develop secondary traumatic stress as a result of media exposure. To ad-

dress this phenomenon, Mancini (2019) developed the Secondary Traumatic Stress Scale for Social Media Users (STSS-SM) and with this scale, secondary traumatic stress was examined through social media posts. Balcı Çelik and Altınışık (2021) conducted the Turkish validity and reliability study of this scale. However, the scarcity of studies, including measurement tools developed for STS, warrants attention.

Although several studies indicate that professionals exposed to the traumas of others experience a significant increase in STS levels (Bride et al., 2007; Bride et al., 2009; Ewer et al., 2015; Hatcher et al., 2011; Kahil & Palabıyıkoğlu, 2018; Yanbolluoğlu, 2019), media-induced STS has been investigated in much fewer studies (Comstock & Platania, 2017). In fact, the DSM-5 diagnosis of PTSD (American Psychiatric Association, 2013) requires a close or work-related relationship with the victim in case of indirect exposure; and the definition of STS by Figley (1998) also implies a personal contact between the trauma victim and the person experiencing STS symptoms. These studies, however, focus on STS symptoms of individuals exposed to media content that reflects traumatic situations resulting from disasters, disease, and war, primarily supported by visuals, i.e. in this case there is no personal contact with the victim. For example, the study by Comstock and Platania (2017) measured the levels of STS that occurred after the public watched traumatic events in the world and the individuals affected by these events on social media and television. Their results suggest that indirect exposure to trauma through the media increases anxiety levels in non-specialists. Secker and Braithwaite (2021) conducted a study investigating the relationship between the frequency of watching news about knife crime on social media and STS. They also investigated the potential moderating effects of gender, age, and location. Accordingly, a higher frequency of knife crime viewed via social media was significantly associated with higher STS symptoms. Additionally, the study found that younger female participants generally scored highest on the STS.

A study on the relationship between media and trauma in Turkey (Atalay, 2017) focuses on the risks journalists face when reporting on violence. This study, which summarizes research showing that journalists experience PTSD due to the traumatic events they have witnessed, highlights the need to raise awareness and support them both through the news organizations they work with and independent organizations. For example, some photos and videos may contain disturbing violence, which increases the risk of secondary trauma. Media professionals act as a filter that protects the reader/viewer when deciding which photo or video to use. However, individuals who perform this task are also likely to be affected by the filtered content. Keats and Buchanan (2013) explored the effects of witnessing trauma on Canadian journalists and photojournalists working on national and international assignments. The study's main purpose was to reveal the participants' understanding of the effects of trauma, disaster, or conflict news within the journalistic culture. As a result of the research, the frequency of exposure to violent images was more stressful for journalists than the duration of exposure.

Especially with the advent of digitization, new media, and social media channels have a more fluid structure that allows for speed, simultaneity, feedback, and fewer control mechanisms than traditional mass media and prosumer environments. These features also allow users to be aware of events worldwide, to comment on them, and to distribute and archive content. While all this has transformed the media content and its relationship to the masses in the digitalized world, it also, unfortunately, forms the basis for access to violence and traumatic events in a short time. Therefore, media content can potentially affect everyday life through "exposure" and subsequent affective interaction.

At this point, it is necessary to explain the main differences between traditional media and new media. In general, while traditional media or mainstream mass media tools are classified as television, radio, and newspaper, new media tools can be classified as social media, internet televisions, YouTube, smartphones, and tablets, etc. In exploring the distinctions and complementarities between the new media and mainstream mass media, one must understand the technical distinctions between these various media forms. Mainstream mass media are typically highly centralized, require significant investment and resources, and can be heavily influenced by governments through various mechanisms and forms of control. The new or alternative media on the other hand have radically different characteristics. The new media such as the Internet can be used for both points to mass communications as well as point-to-point and mass-to-point message distribution. They are also extremely decentralized, require very low investment, provide greater interactivity and public participation, and are much more difficult to control (Salman et al., 2011). Therefore, especially with new media content, since there is no "selection" process of written and visual news material by a gatekeeper (news editor), the STS risk of journalists is now a situation that users may also face.

In contrast to the potentially stress-inducing nature of the media, the frequency with which traumatic events are viewed/represented in the media by the masses is also included in the affective desensitization theory. "The theory asserts that viewers may lose their sense of empathy or sympathy for victims of actual violence, especially when violent media content is constantly consumed" (Abanoz, 2018, pp. 217). If we adopt the normalization

process of something extraordinary to sensitive news based on the studies of Ashforth and Kreiner (2002), the following steps emerge: The diffusion strategy is used to avoid the intense emotions that arise when someone encounters sensitive content for the first time (e.g., an image of a wounded or dead body). The next time we encounter another sensitive content, we go into the reframing stage; in other words, the person tries to put the emotions they have experienced again into a more acceptable form. Therefore, the original sadness, pain, or anger can no longer remain in its original intensity. Another visual, encountered later, starts the adaptation process. Thus, the exposed visuals begin to evoke a much lower emotional feeling. The next stage is normalization. Now, for the sensitive content that the person sees, the intense/painful/helpless/disturbing feeling at the beginning is replaced by an ordinary/everyday feeling. The need to react to and act on things that become ordinary also diminishes.

Overall, trauma-related media content can induce STS, with reactions such as emotional intensity, depression, anxiety, and anger in individuals, while at other times it can lead to depersonalization or not acting by becoming unresponsive. In any case, research into the STS-inducing nature of media exposure is still in its infancy. Therefore, this study has two main objectives: (1) to develop a measurement tool for secondary traumatic stress triggered by post-earthquake media content and (2) to investigate the mediator role of depression between media-induced secondary traumatic stress and psychological well-being. We hypothesized that (1) an exclusive tool is needed to investigate media-induced STS levels in people after an earthquake; (2) a significant relationship exists between media-induced STS and psychological well-being; (3) depression mediates the relationship between media-induced STS and psychological well-being.

Methods

Participants

A series of studies were conducted using convenience samples. Individuals who regularly followed the news through the media covering the 7.8 and 7.4 magnitude earthquakes centered in Turkey/ Kahramanmaras on February 6, 2023 were recruited as participants. First, a small pilot study (Study I) was conducted with 30 participants. After that, Study II was conducted with 265 participants. For Study III, 283 people tested the CFA and mediation model. The minimum number of participants required for Study III was found to be 219 by using the G Power 3.1.9.2, with a reliability ratio of .95, an alpha error of .05, and an effect size of .08 for the relevant analyses (Faul et al., 2007; Soper, n.d.). Therefore, the goal was to recruit at least 250 participants for Study III.

Participants aged between 18 and 65 were included in all three studies. As a potential confounding variable for PTSD, none of the participants lost a loved one (e.g., parent, sibling, or child) following the series of earthquakes. Moreover, all the participants resided in provinces outside the earthquake zone. Most participants in Study I, II, and III also had no previous experience working with trauma survivors. All participants were contacted via Turkey's discussion forums and social networking sites. Data collection for Study I and II took place in March and April 2023 and for Study III in June 2023. Table 1 shows the demographic and background information of the samples in each study.

Table 1. Participants' Demographic and Background Information

		Study I (*N = 30*)	Study II (*N = 265*)	Study III (*N = 283*)
Age	Mean (*SD*)	31.5 (14.4)	34.7 (12.6)	29 (7.4)
		n (%)	*n* (%)	*n* (%)
Gender	Female	22 (73.3)	164 (55.6)	178 (62.9)
	Male	8 (26.7)	130 (44.1)	102 (36.0)
	Other	-	1 (0.3)	11 (1.1)
Education	Elementary	0 (0.0)	2 (0.7)	1 (0.4)
	Middle School	1 (3.3)	2 (0.7)	1 (0.4)
	High School	3 (10.0)	29 (9.8)	15 (5.3)
	Undergraduate	8 (26.7)	148 (50.2)	133 (47.0)
	Master	8 (26.7)	55 (18.6)	100 (35.3)
	PhD	9 (30.0)	45 (15.3)	32 (11.3)
	Other	1 (3.3)	12 (4.7)	1 (0.4)

(continued on the next page)

Table 1. continued

		Study I (*N = 30*)	Study II (*N = 265*)	Study III (*N = 283*)
		n (%)	*n* (%)	*n* (%)
Average hours spent on earthquake-related media	0 – 2 per day (%)	7 (23.3)	118 (40.0)	154 (54.4)
	2 – 4 per day (%)	13 (43.3)	107 (36.3)	92 (32.5)
	4 – 6 per day (%)	5 (16.7)	47 (15.9)	26 (9.2)
	6 – 8 per day (%)	1 (3.3)	13 (4.4)	6 (2.1)
	More than 8 per day (%)	4 (13.3)	10 (3.4)	5 (1.8)
Working with trauma abusers	No (%)	24 (80.0)	242 (82.0)	189 (66.8)
	Yes (%)	6 (20.0)	18 (18.0)	94 (33.2)
Primary media platform to track earthquake-related news	Traditional	18 (60.0)	90 (30.5)	54 (19.0)
	Social Media	6 (20.0)	111 (37.6)	181 (64.0)
	Verbal	6 (20.0)	94 (31.9)	48 (17.0)
Number of media platforms followed to track earthquake-related news	One	20 (66.0)	221 (74.9)	189 (66.8)
	Two	6 (20.0)	53 (18.0)	70 (24.7)
	Three	4 (13.3)	21 (7.1)	24 (8.5)

Procedure

This research received ethical approval from the Dogus University Ethics Committee under the reference number E-42435178-050.06.04-44264. All participants were fully informed about the purpose of the study per the Declaration of Helsinki (World Medical Association, 2022) and voluntarily consented to participate in the online survey. The survey was conducted using Google Forms, which is compatible with computers and mobile devices.

In Study I, a preliminary pilot study was conducted with Turkish university students and experts to ensure the construct validity of EMC-STS. During this process, participants could provide feedback on the survey. After getting feedback, some of the questions were eliminated and Study II was conducted to test the psychometric characteristics of EMC-STS. However, to avoid counterbalancing during Study II, respondents were divided into two groups and presented with a different order of questions. Study III aimed to confirm the factor structure of EMC-STS, and to test the mediating role of depression on the relationship between secondary traumatic stress and psychological well-being. Participants spent approximately 10 minutes on each study. For the initial part, participants' demographic and background information is gathered. Following this section, participants completed questionnaires on secondary traumatic stress, depression, and psychological well-being.

Measures

Demographic and Background Information

All three studies began with collecting background information about the participants; including gender, age, educational status, average hours spent on earthquake-related media, working with trauma abusers, primary media platforms to track earthquake-related news, number of media platforms followed to track earthquake-related news, proximity to earthquake zones and experiences of personal loss due to the events. In addition, the studies included the self-reported questionnaires presented below. All measures were administered in Turkish.

Earthquake Related Media Content and Secondary Traumatic Stress

Firstly, 36 items were created for this study. The content of these items was partially derived from items of the STS (Bride et al., 2004) and STSS-SM (Mancini, 2019), and all the symptoms were related to the DSM-5 criterion for PTSD. In addition to intrusion, arousal and avoidance symptoms, which have been measured by previous instruments (Bride et al., 2004; Mancini, 2019), the measurement of media distrust was targeted, including how media contents about the earthquake affected individuals' emotions and cognitions. Many items created were modifications of the aforementioned previous measures, while additional items were developed based on the information from the literature review. Discussions were held and items were modified to reach a consensus and increase the face validity of the measures.

The scale items were reviewed with two academic experts, a professor in clinical psychology, and a professor in media studies specialized in traumatic experiences such as natural disasters. They provided various suggestions

concerning the scale items, such as flow, grammar, and context. The items were also evaluated by the pilot study participants in Study I. Based on the expert opinions and the pilot study, 2 items were eliminated due to contextual problems. Then 17 items were eliminated due to statistical problems during Study II.

Finally, a 17-item scale was developed involving the dimensions of secondary traumatic stress and media distrust, the Earthquake Related Media Content and Secondary Traumatic Stress Scale - Turkish (EMC-STS) (see the Appendix for the questionnaire). Four subscales were created after the analysis: intrusion (items 1, 2, 3, 4, 5 and 12), anxiety (items 6, 9, 13 and 15), media distrust (items 7, 8 and 11) and avoidance (items 10, 14, 16 and 17). Participants responded to each item on a 5-point Likert-type scale, ranging from 1 (indicating that it does not describe me at all) to 5 (indicating that it describes me completely). Media distrust items were coded reversely; the total score was calculated after reversing the scores of this subscale. The total score, calculated as the sum of all items, can range from 17 to 85, with higher scores indicating higher STS levels. The scale could be completed in approximately 3 minutes. Detailed information on the psychometric properties is given in the Results section.

Social Media and Secondary Traumatic Stress

The Secondary Traumatic Stress Scale for Social Media Users (STSS-SM), developed by Mancini in 2019, is a 17-item instrument designed to assess symptoms of intrusion, avoidance, and arousal associated with indirect exposure to traumatic experiences through social media platforms. It was developed as a modification of STSS (Bride et al., 2004) via looking at STS through social media content. Items are rated on a Likert-type scale, with 1 indicating never, to 5 indicating very often. Higher total scores equal the higher secondary traumatic stress level. Participants considered their symptoms in the last month. This scale had no revised items and could be completed in approximately 2 minutes. In a validity and reliability study conducted by Mancini (2019), the internal consistency coefficient (Cronbach's α) of the scale and subscales was determined to be .92, .88 for intrusion, .80 for avoidance, and .79 for arousal. Balcı Celik and Altınısık (2021), conducted a validity study of the scale in a Turkish context, and reported a Cronbach's alpha value of .95 for the entire scale, indicating a high level of internal consistency. The total score of this scale was used to test convergent validity; for Study II, the Cronbach's alpha coefficient was .93.

Depression

The Beck Depression Inventory (BDI) was initially developed by Aaron T. Beck et al. in 1961 as a comprehensive measure to assess the severity and level of depressive symptoms and identify the risk of depression. It encompasses emotional, cognitive, somatic, and motivational components. The scale consists of 21 self-report items (Beck et al., 1961; Beck & Beamesderfer, 1974; Beck & Steer, 1984). The Turkish validation and reliability study of the BDI scale was conducted by Hisli (1989a; 1989b). The items in the scale reflect various symptoms associated with depression without implying any specific theoretical explanation for the etiology of depression. These symptoms include depressive mood, pessimism, feelings of failure, dissatisfaction, guilt, self-hatred, self-blame, desire for punishment, crying spells, irritability, social withdrawal, indecision, distorted body image, work impairment, sleep disturbances, fatigue, decreased appetite, weight loss, somatic complaints, and decreased libido. Each response on the Likert-type scale is scored from 0 to 3 and there are no reverse items. A score of "0" indicates the absence of depressive symptoms, while options 1, 2, and 3 reflect the intensity of the symptoms experienced. The Turkish version of the scale has a cut-off point of 17 and a Cronbach's alpha coefficient of .80. The scale is interpreted based on score ranges as follows: scores of 1–9 are considered normal, 10–16 indicate mild depression, 17–29 are moderate depression and 30–65 reflect severe depression (Hisli, 1989a). In the current study Cronbach's alpha coefficients for the BDI scale reached .92, and .94 for Study II and III. Participants were instructed to fill out the questionnaire based on their symptoms in the last month. The scale could be completed in approximately 2 minutes.

Psychological Well-Being

The Psychological Well-Being scale (PWB), created by Diener et al. (2009), consists of eight items that capture crucial aspects of human functioning, including positive interpersonal connections, a sense of competence and effectiveness, and leading a life filled with meaning and purpose. Participants respond to the items of the Psychological Well-Being scale on a Likert-type scale from 1 to 7, where 1 signifies strong disagreement, and 7

represents strong agreement. This scale had no revised items. The total score on this scale can vary between 8 (indicating low levels of well-being) and 56 (indicating high levels of well-being). Telef (2013) conducted a validity and reliability study of the Turkish version of the Psychological Well-Being scale. The questionnaire's internal consistency coefficient (Cronbach's α) was determined to be .80, indicating a good level of reliability. In Study III, Cronbach's alpha coefficient was .91, suggesting acceptable internal consistency. The scale could be completed in approximately 2 minutes.

Statistical Analysis

The primary objective of this study was to develop the Earthquake Related Media Content and Secondary Traumatic Stress Scale in Turkish (EMC-STS). Additionally, a mediation model involving depression as a mediator between earthquake-related secondary traumatic stress and psychological well-being will be tested.

In Study I, participants (N = 30) filled out the scale and gave information about the practicality of the questionnaire. 2 items were eliminated at this point. Then construct validity, Principal Component Analysis (PCA), Cronbach's alpha reliability analysis, and convergent validity analysis were employed to accomplish the first goal during Study II (N = 265). The normality was tested with the Kolmogorov-Smirnov Normal Distribution Test (K–S), also observing kurtosis and skewness values. To meet the normal distribution assumption, the skewness and kurtosis values were expected to vary between –3 and +3. Since the number of participants was over 100, it was accepted that the data was normally distributed if the kurtosis and skewness values were within the expected limits even if $p < .05$ according to the K–S test (Kline, 2016/2019).

The process of item reduction considered convergent validity, item loadings, explained variance, and interitem correlations. Within the scope of the construct validity of EMC-STS, first, the item-total score correlations were examined for item discrimination. It was expected that the item-total score correlation for each item would be at least .20; if any item-total correlation coefficients were below .20, these items would be eliminated (Field, 2018; George & Mallery, 2019). Then PCA was used to decrease the item count and finalize the scale. Selecting the number of components was guided by theoretical considerations, eigenvalues greater than 1, and the scree plot test proposed by Cattell (1966). Subsequently, an Oblimin rotation was conducted with the determined number of components. The suitability of the data for factor analysis was evaluated with the Kaiser-Meyer-Olkin (KMO) coefficient calculated for the adequacy of sample size and the Bartlett sphericity test was used for the suitability of distribution; the KMO value of at least .70 and the Bartlett sphericity test X^2 value being highly significant were accepted as criteria. In addition, we were aiming for the common variance value of each item and its loading on the first factor in the pre-rotation factor matrix to reach at least .30. In the pattern matrix obtained after rotation, it was determined that each item should be loaded on the factor it belongs to with at least .30 and in case of double loading, the difference should be at least .10. It was planned to remove the items that did not meet the conditions from the analysis until the aforementioned conditions were met and to repeat the operations in the relevant step. Cronbach's alpha internal consistency coefficients were calculated as indicators of reliability regarding the scales' final version after PCA. It was expected that these coefficients would be at least .70 and the item-total score correlations would be at least .20 (Field, 2018). The final model consisted of 17 items with four factors. Based on Mancini's (2019) scale development, Bride et al. (2004) and Figley's (1995; 1998) configuration of secondary traumatic stress, subsequent analyses were conducted on the total score of the EMC-STS. Figley (1995; 1998) defined the concept of secondary traumatic stress as a combination of anxiety, arousal and intrusion. In addition to these factors, in this study, media distrust was also considered to be a source that feeds media-induced secondary traumatic stress. To test convergent validity, the Pearson correlation test is performed.

For Study III, the confirmatory factor analysis (CFA) and mediation model were tested (N = 283). CFA of EMC-STS with four factors was conducted with another sample, since the best way to verify the factor structure obtained as a result of EFA is to test the factor structure in a different sample with CFA (Kline, 2016/2019). To evaluate the adequacy of the estimated Confirmatory Factor Analysis (CFA) models, commonly used fit indices, including the root mean squared error of approximation (RMSEA) with a 90% confidence interval, standardized root mean squared residual (SRMR), comparative fit index (CFI), Goodness of Fit Index (GFI) and Adjusted Goodness of Fit Index (AGFI) were presented. Maximum Likelihood Estimates were used to determine multinormal distribution, factor loadings, extractions and item-total correlations. For these indices, the cut-off criteria suggested by Hu and Bentler (1999) and Baumgartner and Hombur (1996) are utilized, with values of ≤ .06 for RMSEA, ≤ .08 for SRMR, and ≥ .90 for both GFI, AGFI, and CFI. We also provide the χ^2/df and the corresponding significance test. It is important to note that these measures are difficult to interpret on their own as they

are highly influenced by the sample size (Hu & Bentler, 1999). Moreover, the mediation effect was investigated by PROCESS, a modeling tool that utilizes ordinary least squares (OLS) regression to analyze observed variables (Hayes et al., 2017). The software investigates how one or more mediating or moderating variables impact the relationship between the independent and dependent variables. It calculates the direct, indirect, and total effects of variable X on variable Y, along with unstandardized and standardized regression coefficients, standard errors, and other statistics such as *t* and *p* values and R^2. Unlike the Sobel test, the Process Macro offers a range of coefficients and test statistics that elucidate the indirect, direct, and total effects and total and partial effect sizes. PROCESS has several models regarding the chosen analysis; for this part, Model 4 was selected for the intent to create a mediation model. A bootstrapping method was performed using SPSS Process Macro to examine if depression mediated the relationship between secondary traumatic stress and psychological well-being. The Options "Show total effect model," "Effect size," and "Standardized coefficients" were selected to observe the mediation.

While all analyses of Study I and II were calculated with the SPSS v26 package program, PROCESS v4.2 for SPSS and AMOS v26 were used in Study III. The study's research design is the cross-sectional survey method in the causal/comparative model. The Levene homogeneity test was used to control the variances among the groups of demographics, and since all groups were found to have equal variance ($p > .05$), no participant group was excluded.

Results

Study I: Item Generation and Pilot Study

First, 36 items were created to measure the relationship between earthquake-related media content and secondary traumatic stress. In Study I ($N = 30$), participants' feedbacks about the scale were gathered and discussed with the experts. Two of the items ("The news and posts about the earthquake do not affect me.", "I stay away from events, people and places that remind me of the earthquake.") had grammatical issues, contextual problems or repetitive meanings; therefore, these items were deleted before Study II, which continued with 34 items.

Study II: Item Reduction and Psychometric Properties of EMC-STS

Firstly, item-total score correlations were analyzed in Study II. Nine items were eliminated due to low levels (in between .03 and .17) of correlations. Then, during the first PCA with 25 items, eight items were eliminated due to double loadings [e.g. "Some elements used in earthquake news (sad music, still photos, etc.) increase my anxiety.", "When I see disasters happening to people through the media, I fear for my own life."].

Therefore, the most compatible seventeen items were selected and tested through PCA (KMO = .92; $\text{Bartlett}_{(351)} = 3851.87$, $p < .001$), based on the four-factor model's theoretical background. The four-factor structure was confirmed by the eigenvalues, accounting for 62% of the total variance. The scree plot obtained from the same analysis also confirmed the four-factor structure with seventeen items. Three items (item num. 7, 8, and 11) were coded reversely. Table 2 presents the items and their formulations derived from Study II. The factor loadings on these components ranged from .44 to .93. The final scale exhibited a Cronbach's alpha coefficient of .81. At the same time, the subscales for intrusion, arousal, media distrust, and avoidance had Cronbach's alpha coefficients of .84, .78, .74, and .74, respectively. The skewness and kurtosis values of each scale was in between (–3) and (+3); therefore the scales were normally distributed (see Table 3).

The convergent validity of EMC-STS was measured from the correlation with STSS-SM and BDI. Results revealed a significant positive correlation between EMC-STS and STSS-MS ($r = .50$, $p < .001$), and BDI ($r = .32$, $p = .002$).

Study III: Confirmatory Factor Analysis (CFA) of EMC-STS and Mediation Effect

This study including 283 participants had two objectives: to examine a CFA of the EMC-STS and to test the mediating role of depression in the relationship between secondary traumatic stress and psychological well-being.

Fit statistics of the CFA analysis showed a good fit in the model (a 4-factor model, based on PCA results presented in Table 2), $\chi^2(122) = 357.46$, $\chi^2/df = 2.93$, $p < .001$, RMSEA = .059 (90% CI [.028, .090]), SRMR = .07, GFI = .89, AGFI = .88 and CFI = .90. Table 4 shows descriptive statistics of the scale's final version, while factor covariances and standardized factor loadings can be seen in Figure 1.

Table 2. Factor Construction of EMC-STS: Exploratory Factor Analysis Results of Study II (*N* = 265)

Factor names and items	Factor loadings	Extraction	Item-total correlation
Intrusion. 6 items. Eigenvalue = 6.68; Variance = 39.3%			
2. When I put myself in the place of earthquake victims, my heart starts beating fast.	.83	.73	.57
1. I feel helpless when I think of earthquake victims.	.81	.61	.47
3. When I see the experiences of those affected by the earthquake in the media, I feel as if I lived it myself.	.79	.69	.46
4. Because of some images, I lost sleep.	.55	.61	.63
12. I lose my appetite as I watch the news about the earthquake.	.54	.49	.56
5. When I see the people pulled out of the wreckage, I think it is me instead of them, and I am scared.	.50	.56	.59
Anxiety. 4 items. Eigenvalue = 1.69; Variance = 10%			
13. I do not want to stay indoors as I watch earthquake-related footage on the news.	.76	.56	.56
6. The news about the earthquake makes me uneasy.	.74	.56	.59
15. I am worried that there will be earthquakes again as I am exposed to earthquake footage.	.71	.60	.58
9. Media content with constant earthquake warnings raises my concerns.	.67	.60	.65
Media distrust. 3 items. Eigenvalue = 1.15; Variance = 6.7%			
*7. I am more sensitive to earthquakes after the news I see in the media.	.82	.70	.31
*8. After the news I saw in the media, I need to take action to avoid disaster during the earthquake.	.81	.65	.42
*11. Watching earthquake-related programs motivates me to act on issues I am worried about.	.67	.68	.35
Avoidance. 4 items. Eigenvalue =1.02; Variance = 6%			
16. I want to be alone when I see the earthquake shares in the media.	.93	.80	.30
17. After sharing about earthquake victims, I have a problem focusing.	.63	.68	.58
10. I have nightmares because of the images shared in the media.	.58	.51	.56
14. The news about earthquake victims in the media reduces my faith in living.	.44	.53	.58

EMC-STS: Earthquake Related Media Content and Secondary Traumatic Stress Scale
Note: Factor loadings and explained variances are values observed after rotation. Items with (*) were reverse coded prior to analysis.

Table 3. Descriptive Statistics of the EMC-STS Total Score and Its Subscales in Study II (*N* = 265)

	EMC-STS Total score	EMC-STS subscales			
		Intrusion	Anxiety	Media distrust	Avoidance
Mean (*SD*)	49.2 (9.3)	23.1 (5.2)	13.1 (4.2)	6.9 (2.8)	10.3 (3.9)
Skewness	–.41	–.74	–.42	.69	.58
Kurtosis	–.09	.33	–.50	.25	–.11

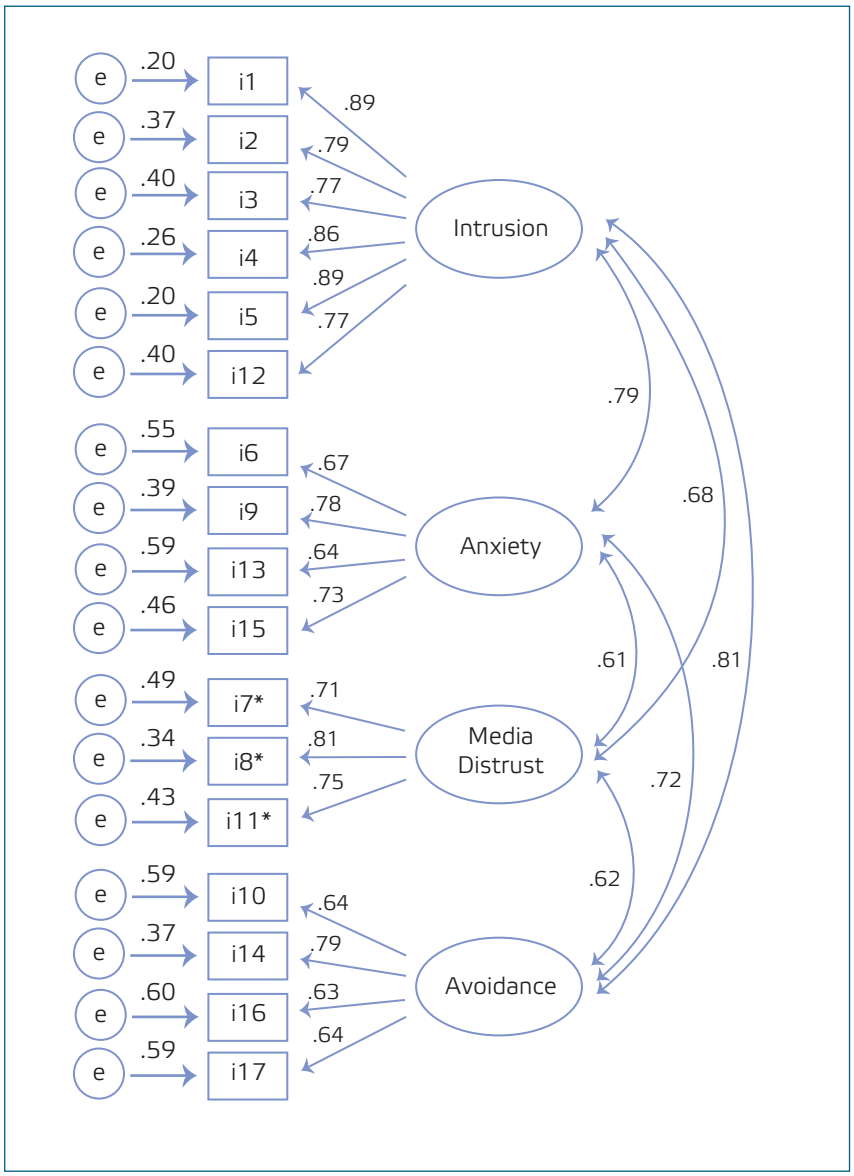
EMC-STS: Earthquake Related Media Content and Secondary Traumatic Stress Scale

Table 4. Descriptive Statistics of the EMC-STS Total Score and Its Subscales in Study III (*N* = 283)

	EMC-STS Total score	EMC-STS subscales			
		Intrusion	Anxiety	Media distrust	Avoidance
Mean (*SD*)	53.1 (9.9)	22.9 (5.1)	14.1 (3.9)	6.4 (2.5)	9.8 (3.8)
Skewness	–.33	–.62	–.36	.63	.50
Kurtosis	–.01	.20	–.43	.20	–.03

EMC-STS: Earthquake Related Media Content and Secondary Traumatic Stress Scale

Figure 1. Standardized Parameters of CFA for EMC-STS in Study III (*N* = 283)

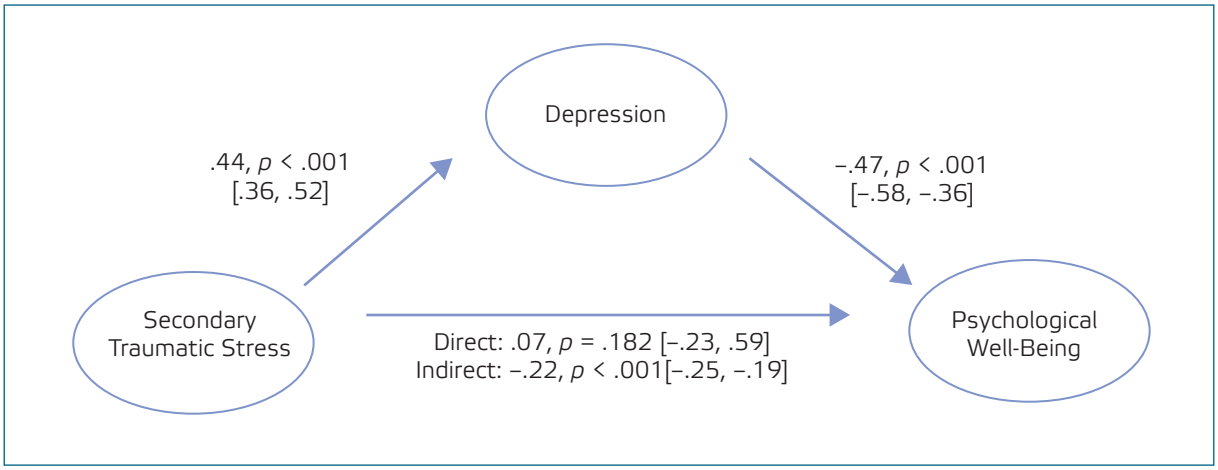


Note: Items with (*) were reverse coded prior to analysis.

For the mediation, media-related secondary traumatic stress was assessed as the independent variable (IV), psychological well-being as the dependent variable (DV), and depression as the mediator (M). Firstly, the results indicated a significant positive relationship between secondary traumatic stress and depression (β = .44, $p < .001$). This finding suggests that higher levels of secondary traumatic stress are associated with greater symptoms of depression. Second, a significant negative relationship was observed between depression and psychological well-being (β = –.47, $p < .001$). This implies that higher levels of depression are associated with lower levels of psychological well-being.

Furthermore, the relationship was found to be non-significant when examining the direct effect of secondary traumatic stress on psychological well-being (β = .07, $p = .183$). This indicates no direct relationship between secondary traumatic stress and psychological well-being. To explore the mediating role of depression, an analysis of the indirect effect was conducted. The results revealed a significant indirect effect of secondary traumatic stress on psychological well-being through depression (β = –.22, *SE* = .027, 95% CI [–.25, –.19]). This suggests that depression partially mediates the relationship between secondary traumatic stress and psychological well-being. The mediation analysis summary is shown in Figure 2.

Figure 2. The Mediation Model with Standardized Coefficients in Study III (*N* = 283)



Discussion

The first of our primary purposes in this research was to develop a measurement tool for secondary traumatic stress symptoms triggered by media contents related to the earthquake, the second was to conduct a mediation effect test, including this measurement tool. Therefore, we firstly hypothesized that STS levels would be affected by media exposure. Moreover, a novel measurement tool is needed to investigate STS induced by earthquake-related media contents. Finally, there is a significant association between media-induced STS and psychological well-being, and depression would mediate this relationship. The results indicated that both objectives have been achieved.

Previous studies had revealed that individuals from various occupational groups (e.g., nurses, lawyers, social workers) may develop secondary traumatic stress due to the traumatic situations they are indirectly exposed to (Bride et al., 2007; Bride et al., 2009; Ewer et al., 2014; Hatcher et al., 2011; Kahil & Palabıyıkoğlu, 2018; Yanbolluoğlu, 2019). Most of these studies only focused on the relationship between individuals' descriptives (e.g. age, gender) and their STS levels. In this current study, EMC-STS directly measured secondary traumatic stress induced by media contents related to an earthquake, a particular type of trauma. Since the study's focus lay on investigating secondary stress due to earthquake-related media content, this study specifically examined people who did not suffer any losses, as there was a possibility that it could be confused with post-traumatic stress.

In the EMC-STS developed as a product of these studies, intrusion was identified as the highest rated (M = 22.9, SD = 5.1 for Study III) among the participants' stress reactions. Intrusion includes trauma-related negative emotions, thoughts, images, and sensations that individuals unintentionally experience due to traumatic events or incidents. Hence, users need to develop media literacy awareness. Media literacy is the ability to access, analyze, evaluate, and communicate messages in various forms (Aufderheide, 1993). To control the involuntary exposure level of individuals under control after a disaster, they need to know how, how much, and how to consume media content.

In parallel with the studies in the literature investigating the relationship between media and secondary traumatic stress (Atalay, 2017; Keats & Buchanan, 2013), this study examined the level of STS induced by media content. However, whereas Comstock and Platania (2017) examined secondary traumatic stress using DSM-IV-TR criteria in their study, for the current study, items relating to secondary traumatic stress symptoms were created using the DSM-5.

Also, Comstock and Platania (2017) emphasized the importance of secondary traumatic stress, which may arise from media content, among the factors affecting psychological well-being. Psychological well-being is the management of the existential challenges individuals face in their lives (Keyes et al., 2002). The exacerbation of secondary traumatic stress, which may arise from media exposure, leads to depression, hurting the personal development of individuals and their ability to communicate with others at a quality level. Therefore, the media industry needs to create structural and fundamental changes in areas such as broadcasting. A sensitive approach needs to be taken for broadcasting news about uncontrolled traumatic events such as natural disasters.

It is important to consider ethical values when creating media content. Alongside these ethical values, one of the duties that should be assumed by the media on behalf of the public is to avoid the elements that will trigger an individual or social trauma. Content created for "click-bait", such as the use of visuals designed to attract at-

tention, and striking headlines without any control mechanism, can harm social life. The primary role of the news media is to provide accurate information to the public, but this information should be presented in a way that does not lead to traumatic results.

Disaster journalism is the process of obtaining information about any extraordinary event that risk societies are exposed to, using the right resources and specializing on the subject before, during, and after the disaster. The responsibility for disaster preparedness, response, and mitigation rests with the media (Kutukoglu, 2021). Thus, it is imperative that media professionals receive training in disaster journalism and that the course on disaster journalism be introduced in journalism education institutions.

Testing the mediation role of depression between STS and psychological well-being is also considered to be a novel approach that will contribute to the literature. As emphasized by Ariapooran et al. (2022), high levels of secondary traumatic stress are associated with increased levels of depression, and this relationship is also included in the current study. In addition, Perstling and Rothmann's (2012) study revealed a significant and negative relationship between secondary traumatic stress and psychological well-being, similar to our present study. In both studies, secondary traumatic stress was limited to some occupational groups and was not based on media content. Therefore, the present study can be considered as pioneering. The results highlight the critical mediating role of depression in explaining the relationship between media-induced secondary traumatic stress and psychological well-being. The results suggest that individuals experiencing higher levels of secondary traumatic stress may be at an increased risk of developing depression, negatively impacting their psychological well-being.

Strengths and Limitations

In this study, we have developed a unique concept while focusing on the relationship between secondary traumatic stress and media. We tested this concept by performing a model test to assess its usability. Our study was at the forefront due to the steps we have taken to create a tool to address the unique problem of media-related STS and testing it with mediator effects. The aim of our study was to develop a tool that measures secondary traumatic stress resulting from earthquake-related media content. Previous studies have either overlooked the existence of secondary traumatic stress or have failed to measure it using earthquake-specific media content.

One of the main limitations of the study is that it was conducted with adults (+18). It is well known that the age limit for the use of new media is especially low (Vogels et al., 2022). The ability of children and adolescents to cope with the traumatic processes they may experience after a natural disaster may remain more primitive than that of adults. Secondary traumatic stress levels may increase if they are exposed to images of earthquake survivors their age. Users under the age of 18 were excluded from the study since a separate evaluation should be made, especially for those exposed to social media. The study's second limitation is that the research is conducted online and with self-report scales. The method of online data collection was preferred because of the advantage of collecting data from different locations; however, since the data is self-reported, its accuracy may be questionable. Furthermore, it was assumed based on the research call that participants followed earthquake-related news regularly, this, however, could not be directly confirmed based on the variable measuring average time spent on earthquake-related media. Also, collecting data online may represent people who use more social media, which will create a problem for generalizability. Finally, the effect that media type, occupation, and closeness to the location bears STS may also need to be tested.

The studies presented explored media induced STS symptoms. While trauma-related media contents can elicit reactive responses like heightened emotions, depression, anxiety, and anger in individuals, it can also lead to outcomes such as depersonalization or a lack of responsiveness. It is crucial, however, not to solely concentrate on the negative impacts of media content on individuals. Media, including news and interviews with opinion leaders, has earned the audience's trust and possesses the potential to positively influence people. The key lies in creating news that incorporates the psychological states of the masses while considering the conditions under which media content is produced and adhering to ethical principles and rules.

Conclusion, Implications, and Future Directions

It's worth noting that secondary traumatic stress is typically associated with trauma-focused occupational groups, with media not explicitly identified as a source. Thus, the study had two primary goals: to devise a measurement tool for identifying secondary traumatic stress stemming from post-earthquake media content, and to formulate a model in which depression acts as a mediator in the relationship between this secondary traumatic stress and

psychological well-being. The first of our hypotheses was realized through Studies I, II and III. In other words, the EMC-STS scale was contributed to the literature, and an essential measurement was created for earthquake-related media contents and media-related STS levels. Also, our hypothesis was verified as a result of the mediation analysis conducted in hypotheses 2 and 3. Hereby, not only a significant relationship was found between media-related STS and psychological well-being but also, depression was confirmed as a significant mediator in between media-induced STS and psychological well-being.

The first suggestion for future studies is to develop separate scales for other traumatic events that are not considered to be natural disasters and to conduct an in-depth analysis. Different traumatic events may result in different psychological consequences. Therefore, separate measurement tools should be developed, at least for artificial or naturally occurring traumatic events. Another critical point is the need to develop special prevention programs that prepare individuals for such social events, not just experts in the field. Further research and interventions focusing on reducing secondary traumatic stress in media and addressing depressive symptoms may be beneficial in promoting psychological well-being for individuals exposed to trauma. Finally, along with the variables selected for the mediation model, other variables that may influence the process, such as social support, should also be included in the model. High levels of social support may be a protective factor against secondary traumatic stress, therefore social support could be examined as a moderating variable in future studies.

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Selin KİRAZ DEMİR conceptualization, design, methodology, investigation, project administration, data management, formal analyses, interpretation, supervision, writing original draft, writing review and editing.

Nur İNCİ NAMLI: conceptualization, design, methodology, investigation, project administration, data management, formal analyses, interpretation, writing original draft, writing review and editing.

Declaration of interest statement
The authors have no conflicts of interest to disclose.

Ethical statement
This manuscript is the authors' original work.
All participants engaged in the research voluntarily and anonymously.
Their data are stored in coded materials and databases without personal data.
Studies were approved by Dogus University Ethical Commission under the reference number E- 42435178-050.06.04-44264.

Data availability statement
Datasets presented in this article are available from the corresponding author upon reasonable request.

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References

Ariapooran, S., Ahadi, B., & Khezeli, M. (2022). Depression, anxiety, and suicidal ideation in nurses with and without symptoms of secondary traumatic stress during the COVID-19 outbreak. Archives of Psychiatric Nursing, *37*, 76–81. https://doi.org/10.1016/j.apnu.2021.05.005

Abanoz, E. (2018). *Bir teror saldırısı sırasında sosyal medya reaksiyonun duygu analizi* [Sentiment analysis of social media reaction during a terrorist attack]. In Z. Kızmaz (Ed.), *Teror ve Uyusturucu Madde Siddeti*. (pp. 214–232). Hegem.

American Psychological Association (n.d.). *Trauma* https://www.apa.org/topics/trauma

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

Ashforth, B. & Kreiner, G. (2002). Normalizing emotion in organizations: Making the extraordinary seem ordinary. *Human Resource Management Review*, *12*(2), 215–235. https://doi.org/10.1016/S1053-4822(02)00047-5

Atalay, G. E. (2017). Siddeti haber yapmak: Gazeteciler ve travma [Reporting on violence: Journalists and trauma]. *Marmara İletisim Dergisi*, *28*, 21–32.

Aufderheide, P. (1993). *Media literacy: A report of the national leadership conference on media literacy.* Aspen Institute.

Balcı Celik, S. & Altınısık, M. S. (2021). Adaptation of Secondary Traumatic Stress Scale to Turkish for social media users: Reliability and validity study. *Turkish Psychological Counseling and Guidance Journal*, *11*(60), 1–12.

Baumgartner, H., & Hombur, C. (1996). Applications of structural equation modeling in marketing and consumer research: A review. *International Journal of Research in Marketing*, *13*(2), 139–161. https://doi.org/10.1016/0167-8116(95)00038-0

Beck, A. T., & Beamesderfer, A. (1974). Assessment of depression: The depression inventory. *Modern Problems of Pharmacopsychiatry*, *7*(0), 151–169. https://doi.org/10.1159/000395074

Beck, A. T. & Steer, R.A. (1984). Internal consistencies of the original and revised Beck Depression Inventory, *Journal of Clinical Psychology*, *40*(6), 1365–1367. https://doi.org/10.1002/1097-4679(198411)40:6<1365::AID-JCLP2270400615>3.0.CO;2-D

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4*(6), 561–571. https://doi.org/10.1001/archpsyc.1961.01710120031004

Bride, B. E., Smith Hatcher, S., & Humble, M. N. (2009). Trauma training, trauma practices, and secondary traumatic stress among substance abuse counselors. *Traumatology*, *15*(2), 96–105. https://doi.org/10.1177/1534765609336362

Bride, B. E., Jones, J. L., & MacMaster, S. A. (2007). Correlates of secondary traumatic stress in child protective services workers. *Journal of Evidence-Based Social Work*, *4*(3–4), 69–80. https://doi.org/10.1300/J394v04n03_05

Bride, B. E., Robinson, M. M, Yegidis, B., & Figley, C. R. (2004). Development and validation of the Secondary Traumatic Stress Scale. *Research on Social Work Practice, 14*(1), 27–35 https://doi.org/10.1177/1049731503254106

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, *1*(2), 245–276. https://doi.org/10.1207/s15327906mbr0102_10

Comstock, C. & Platania, J. (2017). The role of media-induced secondary traumatic stress on perceptions of distress. *American International Journal of Social Science*, *6*(1), 1–10.

Curry, J. F. & Reinecke, M. A. (2003). Modular therapy for adolescents with major depression. In Mark. A. Reinecke, Frank. M. Dattilo & Arthur Freeman (Eds.), *Cognitive therapy with children and adolescents: A casebook for clinical practice* (pp. 95–127). The Guilford Press.

Diener, E., Wirtz, D., Biswas-Diener, R., Tov, W., Kim-Prieto, C., Choi, D. & Oishi, S. (2009). New measures of wellbeing. In Alex C. Michalos (Ed.), *Aseessing Well-Being: The collected works of Ed Diener* (pp. 247–266). Springer. https://doi.org/10.1007/978-90-481-2354-4

Dirkzwager, A. J., Bramsen, I., Adèr, H., & van der Ploeg, H. M. (2005). Secondary traumatization in partners and parents of Dutch peacekeeping soldiers. *Journal of Family Psychology*, *19*(2), 217–226. https://doi.org/10.1037/0893-3200.19.2.217

Ewer, P. L., Teesson, M., Sannibale, C., Roche, A., & Mills, K. L. (2015). The prevalence and correlates of secondary traumatic stress among alcohol and other drug workers in Australia. *Drug and Alcohol Review*, *34*(3), 252–258. https://doi.org/10.1111/dar.12204

Faul, F., Erdfelder, E., Lang, A.-G. & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175–191. https://doi.org/10.3758/BF03193146

Field, A. (2018). *Discovering statistics using IBM SPSS Statistics* (5th ed.). Sage Publications Ltd.

Figley, C. R. (Ed.). (1995). *Compassion fatigue: Coping with secondary traumatic stress disorder in those who treat the traumatized: Compassion fatigue as secondary traumatic stress disorder: An overview*. Routledge. https://doi.org/10.4324/9780203777381

Figley, C. R. (Ed.). (1998). *Burnout in families: The systemic costs of caring*. CRC Press.

George, D. & Mallery, P. (2019). *IBM SPSS Statistics step by step*. Taylor & Francis. https://doi.org/10.4324/9780429056765

Hatcher, S. S., Bride, B. E., Oh, H., King, D. M., & Catrett, J. J. F. (2011). An assessment of secondary traumatic stress in juvenile justice education workers. *Journal of Correctional Health Care*, *17*(3), 208–217. https://doi.org/10.1177/1078345811401509

Hayes, A. F., Montoya, A. K., & Rockwood, N. J. (2017). The analysis of mechanisms and their contingencies: PROCESS versus structural equation modeling. *Australasian Marketing Journal*, *25*(1), 76–81. https://doi.org/10.1016/j.ausmj.2017.02.001

Herman, J. L. (1997). *Trauma and recovery*. Hachette Book Group.

Hisli, N. (1989a). Beck Depresyon Envanterinin universite ogrencileri icin gecerligi guvenirligi [Validity and reliability of the beck depression inventory for university students]. *Psikoloji Dergisi*, *7*(23), 3–13.

Hisli, N. (1989b). Beck Depresyon Envanterinin gecerligi uzerine bir calısma [A study on the validity of the Beck Depression Inventory]. *Psikoloji Dergisi*, *6*(22), 118–126.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Kahil, A., & Palabıyıkoğlu, N. R. (2018). İkincil travmatik stress [Secondary traumatic stress]. *Psikiyatride Güncel Yaklaşımlar*, *10*(1), 59–70. https://doi.org/10.18863/pgy.336495

Keats, P. A., & Buchanan, M. J. (2013). Covering trauma in Canadian journalism: Exploring the challenges. *Traumatology, 19*(3), 210–222. https://doi.org/10.1177/1534765612466152

Keyes, C. L. M., Shmotkin, D., & Ryff, C. D. (2002). Optimizing well-being: The empirical encounter of two traditions. *Journal of Personality and Social Psychology, 82*(6), 1007–1022. https://doi.org/10.1037//0022-3514.82.6.1007

Kline, R. B. (2019). *Yapısal eşitlik modellemesinin ilkeleri ve uygulaması* [Principles and practice of structural equation modeling] (S. Şen, Trans.; 4th ed.). Nobel. (Original work published 2016)

Kutukoglu, E. (2021). Afet gazeteciligine gundem belirleme kuramı ve izmir depremi haberlerinden bakıs [A look at disaster journalism from agenda setting theory and Izmir earthquake news]. *MEDIAJ*, *4*(2), 211–233. https://doi.org/10.33464/mediaj.994871

Mancini, M. N. (2019). *Development and validation of the Secondary Traumatic Stress Scale in a sample of social media users* [Unpublished doctoral dissertation]. Cleveland State University.

Morrison, J. (2014). *DSM-5 (R) made easy: The clinician's guide to diagnosis*. Guilford Publications.

Motta, R. W., Hafeez, S., Sciancalepore, R., & Diaz, A. B. (2001). Discriminant validation of the Modified Secondary Trauma Questionnaire. *Journal of Psychotherapy in Independent Practice, 2*(4), 17–25.

Perstling, M., & Rothmann, S. (2012). Secondary traumatic stress, psychological wellbeing and life satisfaction of social workers in Namibia. *Journal of Psychology in Africa*, *22*(1), 1–9. https://doi.org/10.1080/14330237.2012.10874515

Salman, A., Ibrahim, F., Abdullah, M.Y. H., Mustaffa, N. & Mahbob, M. H. (2011). The impact of new media on traditional mainstream mass media. *The Innovation Journal: The Public Sector Innovation Journal, 16*(3), 1–11.

Secker, R. & Braithwaite, E. (2021). Social media-induced secondary traumatic stress: Can viewing news relating to knife crime via social media induce PTSD symptoms, *Psychreg Journal of Psychology, 5*(2), 38–49. https://doi.org/10.5281/zenodo.5746737

Soper, D. S. (n.d.). *A-priori sample size calculator for student t-Tests.* Retrieved May 28, 2023, from https://www.danielsoper.com/statcalc/default.aspx

Telef, B. B. (2013). The adaptation of psychological well-being into Turkish: A validity and reliability study. *Hacettepe University Journal of Education*, *28*(3), 374–384.

van der Kolk, B. (2015). *The body keeps the score: Mind, brain and body in the transformation of trauma*. Viking.

Vogels, E. A., Gelle-Watnick, R. & Massarat, N. (2022). *Teens, social media and technology.* Pew Research Center. https://www.pewresearch.org/internet/2022/08/10/teens-social-media-and-technology-2022/

World Medical Association. (2022). *WMA Declaration of Helsinki – ethical principles for medical research involving human subjects.* WMA. WMA Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Subjects – WMA – The World Medical Association

Yanbolluoğlu, Ö. (2019). İkincil travmatik stresin meslek elemanları üzerindeki etkileri: Bir derleme çalışması [The effects of secondary traumatic stress on occupational personnel: A review study]. *Uludağ Üniversitesi Fen-Edebiyat Fakültesi Sosyal Bilimler Dergisi*, *20*(36), 141–164. https://doi.org/10.21550/sosbilder.428251

Appendix : Earthquake Related Media Content and Secondary Traumatic Stress Scale

Below you will find a list of statements made by people who have had traumatic experiences or interacted with traumatized individuals in the media, expressing the impact of their experiences. Read each statement and choose the appropriate number (1 = does not describe me at all; 5 = describes me completely); next to it, to indicate how often this statement has been correct for you in the past month.

	1	2	3	4	5
1. I feel helpless when I think of earthquake victims.					
2. When I put myself in the place of earthquake victims, my heart starts beating fast.					
3. When I see the experiences of those affected by the earthquake in the media, I feel as if I lived it myself.					
4. Because of some images, I lost sleep.					
5. When I see the people pulled out of the wreckage, I think it is me instead of them, and I am scared.					
6. The news about the earthquake makes me uneasy.					
7. I am more sensitive to earthquakes after the news I see in the media.					
8. After the news I saw in the media, I need to take action to avoid disaster during the earthquake.					
9. Media content with constant earthquake warnings raises my concerns.					
10. I have nightmares because of the images shared in the media.					
11. Watching earthquake-related programs motivates me to act on issues I am worried about.					
12. I lose my appetite as I watch the news about the earthquake.					
13. I do not want to stay indoors as I watch earthquake-related footage on the news.					
14. The news about earthquake victims in the media reduces my faith in living.					
15. I am worried that there will be earthquakes again as I am exposed to earthquake footage.					
16. I want to be alone when I see the earthquake shares in the media.					
17. After sharing about earthquake victims, I have a problem focusing.					

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RESEARCH ARTICLE

Factor Structure and Internal Consistency Reliability of the Croatian Version of the Family Adaptability and Cohesion Evaluation Scale (FACES) IV Package: A Preliminary Study

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Introduction: A family operates as a dynamic system comprising various subsystems and is continually interacting with its environment. Therefore, it is essential to comprehend the underlying principles of family functioning. One of the most commonly used models for describing family functioning is the Circumplex Model of Marital and Family Systems (Olson & Gorall, 2003).
Aims: In this study, we aimed at examining the factor structure and internal consistency reliability in the Croatian version of the Family Adaptability and Cohesion Evaluation Scale IV Package, which measures family functioning through family cohesion and flexibility at the balanced and unbalanced levels, as well as family communication and family satisfaction.
Methods: Confirmatory factor analysis (CFA) and exploratory factor analysis (EFA) were performed using a convenient sample of 528 participants.
Results: CFA revealed that the Croatian version of the FACES IV Package does not fit the theoretical model of the original factor structure in this preliminary study. The exceptions were the Family Communication Scale and Family Satisfaction Scale, which showed satisfactory parameters. The results of the EFA of FACES IV showed a 5-factor model solution.
Conclusions: The Croatian version of the FACES IV Package is not completely suitable for use in the national context. Thus, given these preliminary findings, further testing on a more representative or clinical sample is recommended.

Keywords: confirmatory factor analysis (CFA), exploratory factor analysis (EFA), family functioning, FACES IV Package, family satisfaction

Introduction

Family is a dynamic system that contains different subsystems (e.g., relationships between siblings, spouses, parents and children, etc.) and exists in constant interaction with the environment. The theoretical Circumplex Model of Marital and Family Systems is based on a systemic approach to the study of families (Olson & Gorall, 2003). The Circumplex Model enables the study of all the subsystems within the family as well as interactions between the family and the surrounding environment.

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The Circumplex Model of Marital and Family Systems was first conceptualized in the late 1970s (Olson et al., 1979). This model, which integrates systemic theory and family development theory, led to the creation of the Family Adaptability and Cohesion Evaluation Scale (FACES), a prominent international tool for assessing family functioning, due to its robust theoretical foundation and clinical applicability (see Hamilton & Carr, 2016 for a review on self-reported measures to assess family functioning).

The Circumplex Model is one of the most respected and widely used approaches in family studies. It illustrates the changes that occur during the family life cycle and the family's ability to change and adapt, which is one of the characteristics of functional families, as opposed to dysfunctional families. The model describes family functioning through two central dimensions, cohesion and flexibility, and one facilitating dimension, communication. The central dimensions include five levels: three central (balanced) levels and two extreme (unbalanced) levels (Olson & Gorall, 2003).

Family cohesion, the model's first dimension (Olson et al., 2006), explores the emotional relations among family members. For example, family cohesion manifests through different aspects of family functioning, such as time spent together, the existence of common friends, activities, and interests, and the ability to make decisions together. Previous studies on family cohesion have focused on the ways in which family systems balance themselves (e.g., disengaged in comparison to enmeshed). On the one hand, families assessed as disengaged insufficiently support each other. On the other hand, families characterized as enmeshed contest the development of autonomy in family members (Alić, 2016). Olson et al. (2006) highlighted five levels of family cohesion: two extreme unbalanced (disengaged and enmeshed) and three mid-range balanced (somewhat connected, connected, and very connected). Mid-range cohesion is optimal because it balances the family system, which is especially important for a well-functioning family. Extreme or unbalanced levels lead to imbalance in the family system, fostering a lack of independence or the manifestation of overt alienation among family members, resulting in negative consequences (Olson, 2000; Olson et al., 2006).

The study of second dimension, namely family flexibility, evaluates the level of adaptability to changes in family leadership, family rules, and relationships with other individuals. Five levels of flexibility were distinguished: rigid, somewhat flexible, flexible, very flexible, and chaotic (Olson et al., 2006). The mid-range levels contribute to balanced functioning, which enables changes when they are indispensable for marital and family functioning, for example, when participation and leadership in activities are shared equally among all family members, a clear process of role division takes place, and discipline and mutual respect are implicit. An unbalanced and inflexible system is characterized by too few changes, a tendency towards stability at all costs, occasional role changes, and roles ruled by strict discipline. Rigid and chaotic levels, especially over an extended period, are considered risky (Olson et al., 2006).

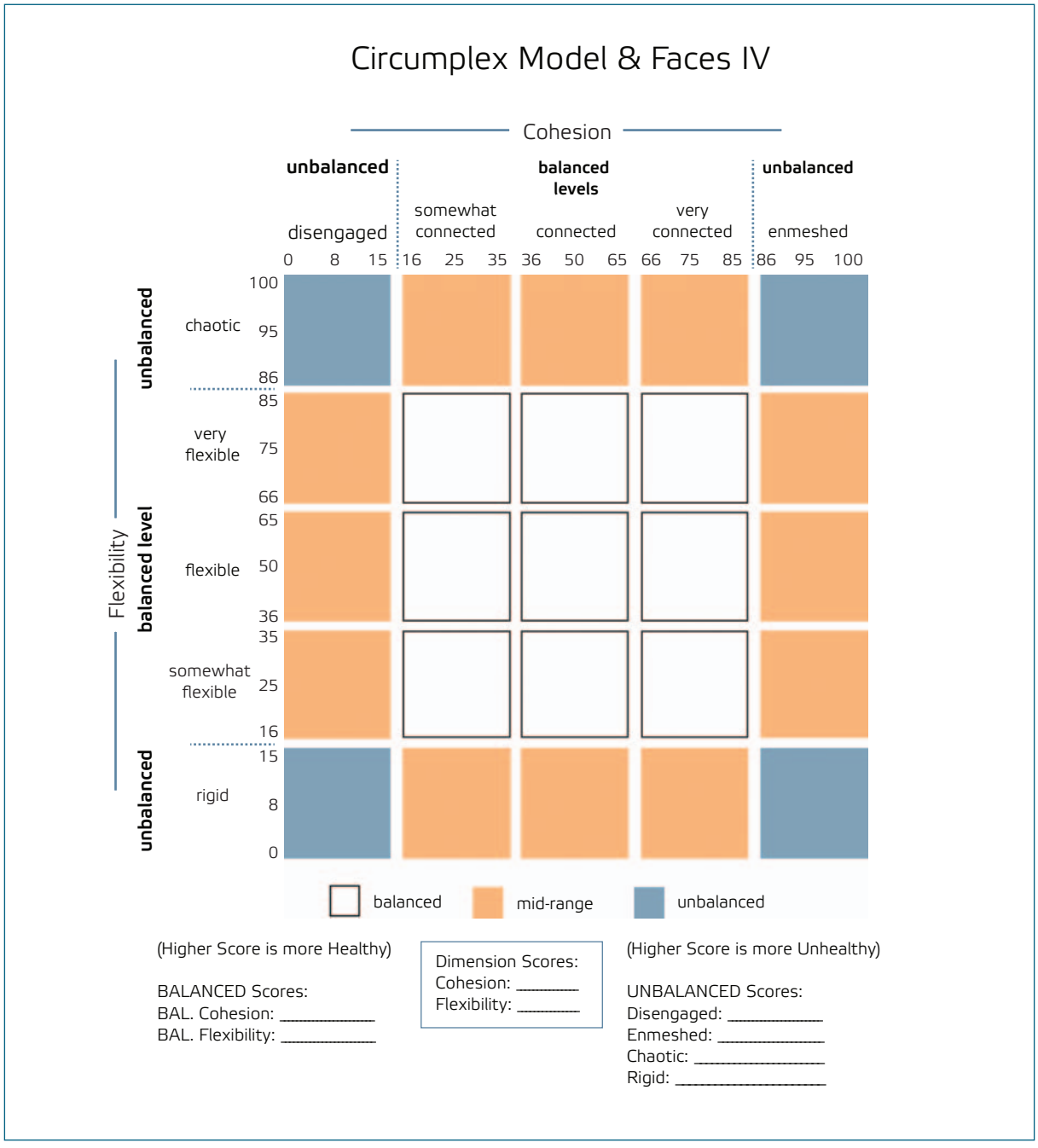
Family communication, as the model's facilitating dimension, allows cohesion and flexibility to be established within the family. Speech clarity, listening skills, continuity tracking, and mutual respect and regard are measured. When conflict arises, the partners or parents in chaotic families do not engage in conversation and refuse to accept any kind of change, while enmeshed families resolve conflict by negating the differences among the family members. Balanced family systems have very good communication in comparison to those systems that lack balance (Olson, 2000; Olson et al., 2006).

Family satisfaction is not explicitly included in the Circumplex model; however, the Family Satisfaction Scale was added to the FACES IV Package with items assessing satisfaction in the three measured dimensions (cohesion, flexibility and communication). Family satisfaction refers to how content and fulfilled family members feel with one another (Olson, 2010).

The changes that take place in families are graphically displayed in the Couple and Family Map presented in Figure 1 (Olson, 2000, 2011). The map shows relations within two central dimensions: cohesion and flexibility. Balanced (functional) family systems are those positioned in the central part of the map, with balanced levels of cohesion and flexibility. In contrast, unbalanced (dysfunctional) family systems are positioned at the edges of the map; that is, at the extremes of both dimensions (cohesion and flexibility).

The measurement tool for operationalizing the changes within families caused by natural life cycles and reactions to stressors has been in development for more than 30 years across the Family Adaptability and Cohesion Evaluation Scale (FACES) series: FACES I, FACES II, FACES III, and the FACES IV Package. In FACES IV, six scales were developed with two balanced scales and four unbalanced scales designed to assess low and high cohesion (ranging from disengaged to enmeshed) and flexibility (ranging from rigid to chaotic).

Figure 1. Couple and Family Map (Source: Olson, 2011, pp. 75.)



High levels of construct and discriminant validity were established, along with providing a clinical example using the FACES IV results for assessing family dynamics, planning treatment, and determining the effectiveness of family therapy (Olson, 2011).

Clinicians and researchers have been using FACES III and the FACES IV Package for decades in clinical and developmental psychology to study family and marital systems (Lee, 2014). The instrument has been used in more than 1,200 dissertations and research papers across 70 countries (Sanderson et al., 2009). While numerous European validations of the instrument exist (Greek: Koutra et al., 2013; Hungarian: Mirnics et al., 2010; Italian: Baiocco et al., 2013; Everri et al., 2020; Portuguese: Gomes et al., 2019; Gouveia-Pereira et al., 2020; Sequeira et al., 2021; Romanian: Rada, 2018; Spanish: Rivero et al., 2010; Vegas et al., 2022), it is not sufficiently recognized in the study of family relations in the Republic of Croatia.

Despite the widespread use of the FACES IV instrument, several recently published adaptation studies failed to confirm its original six-factor structure using all 42 items (Everri et al., 2020; Gouveia-Pereira et

al., 2020; Koutra et al., 2013; Rivero et al., 2010; Sequeira et al., 2021; Vegas et al., 2022). Most previous validations were conducted by first performing confirmatory factor analysis (CFA), followed by exploratory factor analysis (EFA), and by testing intercorrelations among all scales. Additionally, some authors investigated correlations between FACES IV and the scales measuring communication and satisfaction (e.g., Vegas et al., 2022).

To address issues with confirming the original structure in the Spanish version of FACES IV scale, Vegas et al. (2022) revised the original 42-item scale and found good fit for a modified 34-item version. The CFA indicated that the model had acceptable reliability and good convergent and predictive validity after removing problematic items. The final structure retained six factors with good psychometric properties, ensuring their reliability and validity for assessing family adaptability and cohesion in adolescents. This study included participants between the ages of 14 and 18, some of whom came from child protection centers and centers for adolescents with family problems.

Gouveia-Pereira et al. (2020), Rivero et al. (2010), and Sequeira et al. (2021) also found that the original structure of the FACES IV did not confirm well in their studies. They conducted a systematic validation process that included EFAs, leading to an item reduction process. This resulted in a final model consisting of 24 items with four items per scale, providing a more balanced instrument for measuring family functioning. Specific differences among these studies can be found in the samples used. Gouveia-Pereira et al. (2020) conducted two studies where the age of participants ranged from 11 to 21 years. They also recruited a small clinical sample in addition to a community sample. The study conducted by Rivero et al. (2010) included a sample of 455 university students from Spain with an average age of 20.5 years. The study by Sequeira et al. (2021) involved a large sample of 1,083 individuals from 387 nuclear families, ensuring a diverse representation in different regions of Portugal. It is also worth noting that Sequeira et al. (2021) incorporated expert evaluations to assess the instrument's content validity.

Everri et al. (2020) first conducted an item selection based on psychometric properties using data from a larger sample. This involved using the Rasch analysis to identify the items that best measured the intended latent traits. After selecting the items, they validated the shortened version SAD_FACES (Family Adaptability and Cohesion Evaluation Scale for adolescent) to confirm its factor structure and reliability. The authors conducted an Exploratory Structural Equation Modeling (ESEM) to analyze the factor structure of the SAD_FACES scale. This analysis was used to evaluate the dimensionality and reliability of the scale. They found that the factor structure and reliability of the SAD_FACES scale confirmed the original structure of the FACES IV as validated with Italian adolescent samples (N = 446 adolescents aged 14 to 16 years). The study showed that the SAD_FACES scale, a shortened version of FACES IV, had the same factor structure as the original when applied to Italian adolescents. This indicates that the organization of family functioning dimensions (cohesion and flexibility) is consistent with the original FACES IV. In addition, the SAD_FACES scale showed satisfactory reliability and provided consistent results across administrations. This confirms that the shortened version is a valid instrument for measuring family functioning in adolescents and supports the applicability of the theoretical framework of the FACES IV with fewer items. To address potential discrepancies in confirming the original structure, the authors suggested that the SAD_FACES scale allows for the measurement of family functioning with a limited number of items (24 items compared to 42 items in the original FACES IV). This streamlined approach could facilitate research and allow for a more flexible assessment of adolescents' perceptions regarding family functioning, improving the usability of the instrument in different contexts.

Finally, Koutra et al. (2013) were the only authors that confirmed a five-factor solution as more suitable. This solution indicated that the majority of items had higher loadings on two main factors that represented balanced scales, while the remaining factors contained fewer items. In addition, they decided to work separately on the extreme scales of cohesion and flexibility to achieve a better theoretical adaptation to the original model. The study included a large sample of participants (N = 620), with socio-demographic characteristics provided to give context to the results. In addition, the sample consisted predominantly of young adults, a significant proportion of whom were students, and there was a notable lack of diversity in terms of employment and income level.

A common conclusion in most of the studies presented is the concern about the unbalanced scales, namely Rigid and Enmeshed (Everri et al., 2020; Gouveia-Pereira et al., 2020; Sequeira et al., 2021; Vegas et al., 2022),

as well as Disengaged (Koutra et al., 2013; Rivero et al., 2010) and Chaos (Vegas et al., 2022). It is evident that a persistent challenge exists in validating these constructs within the FACES IV framework both before and after the item reduction process (Rivero et al., 2010; Sequeira et al., 2021; Vegas et al., 2022). On the other hand, Gouveia-Pereira et al. (2020) and Koutra et al. (2013) found issues with the aforementioned constructs only before and Everri et al. (2020) after item reduction. The problems with the factor structure found in the study can be attributed to several causes, such as cultural differences, item interpretation, translation and adaptation issues and structural validity.

Understanding family functioning is important across various scientific fields and practical work to appropriately approach the prevention (primary, secondary, and tertiary) of unstable family relationships. Considering the importance of understanding family functioning, we believe that professional services in educational institutions must acquire competence in examining family relations and functioning, for which purpose instruments such as FACES IV Package can be useful tools to conduct high-quality educational and advisory work with parents, children, and families.

As a potential contribution to the study of families in the national context, the objective of this study was to examine the structure and internal consistency in the Croatian translation of the FACES IV Package (Olson, 2011; Olson & Gorall, 2003).

Methods

This study was conducted within the research project "Empowering Families for the Development of Positive Relationships and Family Unity". This project employed a battery of instruments, utilizing the Circumplex Model of Marital and Family Systems (Olson & Gorall, 2003) as the conceptual framework for assessing family system functioning. The primary objective was to investigate family cohesion, flexibility, and communication, as well as parenting practices and competencies, in a sample of parents, children, and older family members. The ultimate purpose was to develop a support program to strengthen families and enhance their quality of life. The project was funded by the University of Rijeka and ran from 2018 to 2023.

Participants and Data Collection

A total of 528 participants were recruited for the study using a convenience sampling method. Data were collected in two waves during 2020 and 2022 through an online survey using the LimeSurvey platform. The participants were informed about the research subject and objectives, their right to anonymity, and the option to withdraw from participation in the research at any time. They were told that the research results would be used exclusively for scientific purposes. The participants' average age was 32.1 (SD = 16.1) years, with the youngest participants being 13 years old and the oldest being 84 years old. Parental consents were obtained for the participants under the age of 14. According to the Ethical Code for Research with Children (National Ethics Committee for Research with Children, 2020), children aged 14 and older can give independent consent to participate in research. The research was approved by the Ethical Committee for Scientific Research at the University of Rijeka (CLASS: 640/01/17-01/80, REGISTRATION NUMBER: 2170-24-02-17-2).

A total of 348 female participants (65.9%) and 180 male participants (34.1%) took part in the research. In the context of family roles, most respondents were first-born (32.6%) or second-born children (23.3%). The majority of these individuals had completed high school education (47.9%) or a bachelor's degree (33.3%). Most were single, never married (44.1%), and lived with their parents (44.7%). In the "other" category for current relationship status, the respondents listed being in a relationship, engaged, and being in a post-divorce relationship. In the "other" category for current living arrangements, the respondents listed roommates and various family members. These results were expected, given that the participants were predominantly students. The data collection method explained the largest ratio in the sample being students. Specifically, the data were collected through an online survey published on the website of the Faculty of Humanities and Social Sciences of the University of Rijeka and on the faculty's social networks, and the research project's social networks. In addition, students were asked to disseminate the survey further. Table 1 provides details of the sample structure.

Table 1. Sample Structure (*N* = 528)

Sample characteristics		*n*	%
Sex	Female	348	65.9
	Male	180	34.1
Age (years)	≤24	305	57.8
	25–34	45	8.5
	35–44	22	4.2
	45–54	107	20.3
	55–64	27	5.1
	65–74	12	2.3
	75+	10	1.8
Education	Some elementary school	7	1.3
	Elementary school	18	3.4
	High school	253	47.9
	Bachelor's degree	176	33.3
	Master's degree	62	11.7
	PhD or magister* degree	12	2.3
Current relationship status	Single, never married	233	44.1
	Single, divorced	11	2.1
	Single, widowed	17	3.2
	Married, first marriage	141	26.7
	Remarried	9	1.7
	Life partnership	28	5.3
	Cohabitation	19	3.6
	Divorced	4	0.8
	Other	66	12.5
Current living arrangements	Alone	34	6.4
	With parents	236	44.7
	With a partner	38	7.2
	With others (grandfather, grandmother)	3	0.6
	With children	17	3.2
	With partner and children	110	20.9
	With others	90	17.0
Family member	Mother	94	17.8
	Father	57	10.8
	First child	172	32.6
	Second child	123	23.3
	Third child	38	7.2
	Fourth or younger child	10	1.9
	Grandmother or grandfather	23	4.4
	Different family member	11	2.1

*It refers to individuals who completed postgraduate studies before the Bologna education reform. After completing a four-year undergraduate program, individuals pursued and completed an additional two years of postgraduate master's studies.

Instrument Description

The FACES IV Package was translated and adapted within the project "Empowering Families for the Development of Positive Relationships and Family Unity". The Family Satisfaction and Family Communication Scales were translated and adapted by Ljubetić, Reić Ercegovac, and Mandarić Vukušić. The authors tested the internal consistency; both scales demonstrated a very high reliability (Cronbach's α = .90) (Ljubetić et al., 2020). Other tests or validations were not conducted. All instruments, including FACES IV, Family Satisfaction Scale and

Family Communication Scale, were translated using the double translation method, with the aim of determining the translation's credibility by first translating it from English into Croatian and subsequently translating it back from Croatian into English. The FACES IV Package was used with the original instrument author's approval for the purposes of this paper.

The FACES IV Package contains four parts: 1) background information (i.e., a sociodemographic questionnaire), 2) the Family Adaptability and Cohesion Evaluation Scale (FACES) IV, 3) the Family Communication Scale, and 4) the Family Satisfaction Scale (Olson, 2011).

The background information section includes questions about sex, age, education, current relationship status, current living arrangements, and family membership (i.e., the role in the family, such as mother, father, first child).

The FACES IV consists of 42 items distributed across 6 scales (each scale contains 7 items). It measures the dimensions of family cohesion and family flexibility at the balanced and unbalanced levels. The balanced scales measure the midranges of family cohesion (B_COH), (e.g., "Family members are involved in each other's lives") and family flexibility (B_FLEX) (e.g., "Discipline is fair in our family"), while the unbalanced scales measure the extremes. Two scales are used for unbalanced family cohesion – Enmeshed (ENMSH) (e.g., "We spend too much time together") and Disengaged (DISEN) (e.g., "We get along better with people outside our family than inside."). In addition, there are two scales for unbalanced family flexibility: Chaotic (CHAOT) (e.g., "Our family feels hectic and disorganized") and Rigid (RIG) (e.g., "Our family becomes frustrated when there is a change in our plans or routines") (see Figure 1). Regarding the scales in the original instrument, their reliability was excellent, with Cronbach's alpha coefficients ranging from .77 to .89 (Olson, 2011).

The FACES IV Package also includes two scales that measure family satisfaction and family communication. Both scales consist of 10 items. The Family Satisfaction Scale measures the levels of happiness and fulfilment that family members feel towards each other. The Family Communication Scale pertains to the sharing of information, ideas, thoughts and feelings among family members. The Family Communication (Cronbach's α = .90) and Satisfaction (Cronbach's α = .92) Scales in the original instrument both demonstrated a very high reliability.

The participants evaluated their family's cohesion, flexibility and communication using a 5-point rating scale (1 = Strongly disagree, 5 = Strongly agree). Family satisfaction was also measured on a 5-point scale, where 1 represented "Very Dissatisfied" and 5 "Extremely Satisfied".

Data Analysis

To test the factor structure in the Croatian version of the FACES IV Package, a CFA was conducted, followed by an EFA. The analyses were conducted using the JASP 0.16.0.0 and SPSS 26 software programs.

Initially, we estimated missing values in the FACES IV Package. Only 2 (0.4%) missing values were identified in the dataset; these were not included in further analyzes. Prior to conducting the CFA and EFA, we assessed whether the necessary assumptions for statistical analyses were met, including the sample size and the normality of distribution. According to Kalkbrenner (2021), the recommended minimum sample size for factor analysis is either a subjects-to-variables ratio of 10:1 (i.e., at least 10 participants per test item) or 200 participants. In this study, the assumption of an adequate sample size was satisfied (N = 528 and 62 items). Although the data were not found to be normally distributed, EFA is known to be resilient to moderate deviations from normality. Therefore, the decision was made to proceed with further factor analysis.

To evaluate the model fit in CFA, the normed chi-square indicator (χ^2/df), absolute fit indices (root mean square error of approximation [RMSEA], goodness of fit index [GFI]) and comparative fit indices (the comparative fit index [CFI], and the Tucker-Lewis index [TLI]) were used. For the normed chi-square indicator, a value lower than 3 or 5 (less strict criteria) was expected. According to Steiger (2007), the upper limit of the recommended RMSEA value is .08, the lenient criterion is from .05 to .08 (Hu & Bentler, 1999; Schumacker & Lomax, 2016). In addition, according to Bentler (1990), the values of the CFI, GFI, and TLI indicators that point to a satisfactory adjustment of the assumed model with the data should be ≥ .80.

In order to explore the structure of the FACES IV in the present sample, an EFA was conducted within an oblique target rotation procedure. First, to distinguish between meaningful factors and those arising from random noise in the data, we conducted an EFA using the principal component method with parallel analysis. Initially, an EFA was conducted with all items, followed by a selective elimination based on specific criteria (negative saturation, cross-loadings and loading below .30). The item reduction process was subsequently con-

cluded by performing a second EFA on the remaining items.

The significance of the Kaiser–Meyer–Olkin (KMO) test and Bartlett's test of sphericity was examined. The recommended KMO value is > 0.60 (Kaiser, 1974). According to Comrey and Lee (2013), factor loadings of .71, .63, .55, .45, and .32 are categorized as excellent, very good, good, fair, and poor, respectively. To ensure internal validity, we evaluated the reliability of the dimensions using Cronbach's alpha and examined zero-order correlations among the dimensions using Spearman's rho. To consider convergent validity, we examined zero-order correlations between the FACES IV dimensions and family communication and satisfaction using Spearman's rho. Finally, we investigated age and sex differences across the FACES IV dimensions also using Spearman's rho. This exploration aimed to determine whether age and sex influenced the FACES IV scores.

Table 2. Factor Structures of the Family Communication Scale and Family Satisfaction Scale

Item number	Factor loading	Std. Error	*p*	R^2
Family Communication Scale				
1	.85	.04	< .001	.58
2	.86	.04	< .001	.60
3	.73	.04	< .001	.52
4	.88	.04	< .001	.64
5	.88	.04	< .001	.73
6	.81	.04	< .001	.65
7	.79	.04	< .001	.62
8	.88	.04	< .001	.68
9	.63	.05	< .001	.28
10	.84	.04	< .001	.62
Cronbach's α	.93			
M	3.81			
SD	0.29			
Skewness	-0.09			
Kurtosis	0.04			
Min	1			
Max	5			
Family Satisfaction Scale				
1	.86	.04	< .001	.68
2	.87	.04	< .001	.64
3	.81	.04	< .001	.61
4	.79	.04	< .001	.64
5	.99	.04	< .001	.76
6	.99	.04	< .001	.76
7	.68	.04	< .001	.38
8	.68	.04	< .001	.76
9	.76	.04	< .001	.52
10	.61	.03	< .001	.48
Cronbach's α	.94			
M	3.67			
SD	0.35			
Skewness	-0.06			
Kurtosis	-0.01			
Min	1			
Max	5			

R^2 = Squared multiple correlation.

Results

Factor Structure of the FACES IV Package

Because the construct validity of the FACES IV Package has not been verified in the Republic of Croatia until now, this study first presents the results of the CFAs based on the original factor structure (Olson, 2011).

Confirmatory Factor Analysis of the FACES IV

The CFA results indicated that the anticipated six-dimensional structure of the FACES IV did not demonstrate a good fit ($\chi^2(804) = 3048.73$, $p < .001$, $\chi^2/df = 3.79$, CFI = .738, GFI = .767, TLI = .719, RMSEA = .073). The only satisfactory criteria, considering a more lenient criterion, were χ^2/df (< 5) and RMSEA.

Confirmatory Factor Analyses of the Family Communication and Family Satisfaction Scales

The CFAs of the Family Communication Scale ($\chi^2(35) = 165.31$, $p < .001$, $\chi^2/df = 4.72$, CFI = .963, GFI = .988, TLI = .925, RMSEA = .084) and Family Satisfaction Scale ($\chi^2(35) = 274.43$, $p < .001$, $\chi^2/df = 7.84$, CFI = .940, GFI = .985, TLI = .932, RMSEA = .114) supported the one-factor structure of each scale. Most of the indices showed a good fit, with the exception of the RMSEA and normed chi-square indicator for the Family Satisfaction Scale, whose values were .114 and 7.84, respectively.

The factor loadings for the Family Communication Scale and Family Satisfaction Scale are presented in Table 2. Factor loadings for both scales confirmed that the data fit well.

Exploratory Factor Analysis of the FACES IV

The CFA results indicated significant problems with the specification of the original model in terms of the six-factor structure in the FACES IV. To identify a smaller set of items that would result in a satisfactory factor

structure and form a scale for measuring family cohesion and flexibility with satisfactory internal consistency reliability, an EFA was conducted on the same dataset using a principal component model with parallel analysis.

The KMO test (.93, $p < .001$) and Bartlett's test were statistically significant ($\chi^2 = 9617.67$; $df = 903$, $N = 528$, $p < .001$), which led to the conclusion that calculating the survey's factor structure was merited.

The first EFA resulted in the extraction of 5 factors (Table 3) that explained 47.9% of the variance. The EFA revealed ambiguous results that hindered the clear identification of the latent dimensions. In particular, the first factor included a wide range of items that belonged to distinct dimensions according to the original theoretical structure. This indicates that at least one item from each theoretical dimension was saturated on the first factor. Consequently, a refinement of the factor structure was deemed necessary. Criteria for eliminating items included: negative saturation on the factors, cross-loadings and saturations below a threshold of .30.

Due to the criteria for eliminating items, 10 items were removed (DISEN3, ENMSH4, DISEN9, CHAOT12, DISEN15, ENMSH16, DISEN21, DISEN27, RIG29, and B_FLEX32). Since negative factor loadings have no theoretical basis and contradict the expectations of the model (Olson & Gorall, 2003), we decided to exclude items showing such saturations after the initial rotation. Furthermore, the presence of negative saturations complicates and confuses the interpretation of the factor structures and thus provides a justifiable basis for removing such items from the analysis (Watkins, 2018). Removing items with negative factor loadings can improve the quality of the measurement instrument, as it allows a focus on the items that are more relevant and useful for measuring the desired constructs (Watkins, 2018).

A second EFA was performed on the remaining items. Based on the presented analyses, the final factor structure was obtained, consisting of 32 items (Table 4) that explained 51.4% of the total variance.

The first factor contained 14 items, while Cronbach's alpha showed a very high reliability of the scale. Twelve items measured Balanced Cohesion and Balanced Flexibility, with one item belonging to the Rigid scale and one to the Enmeshed scale. The next factor included five items, all part of the Rigid scale.

Table 3. Initial Pattern Matrix After Oblique Rotation, Reliability, and Descriptive Indicators

A priori factor and item number	F1	F2	F3	F4	F5	Uniqueness
B_COH1	**.73**	.02	−.01	.10	−.09	.46
B_FLEX2	**.64**	−.02	.01	.16	.08	.58
DISEN3	**−.57**	.12	.16	.03	.11	.59
ENMSH4	.09	−.08	.01	**.30**	**−.35**	.77
RIG5	.09	**.79**	.04	−.02	.04	.36
CHAOT6	**−.43**	.09	**.42**	.02	−.14	.51
B_COH7	**.82**	.02	.11	.08	−.12	.35
B_FLEX8	**.56**	.06	−.04	.13	.14	.63
DISEN9	**−.68**	.10	.05	.17	.07	.47
ENMSH10	**−.31**	.07	.03	**.43**	−.11	.67
RIG11	.00	**.78**	.10	.00	.07	.41
CHAOT12	.21	**−.32**	.17	.29	.24	.71
B_COH13	**.82**	−.02	.04	.01	−.05	.35
B_FLEX14	**.51**	**.30**	−.11	−.02	.17	.53
DISEN15	**−.49**	.02	−.07	.23	.17	.68
ENMSH16	.15	−.03	.15	**.40**	**−.56**	.51
RIG17	.16	**.56**	.03	.26	.08	.58
CHAOT18	−.29	−.01	**.51**	−.02	−.16	.54
B_COH19	**.73**	.12	.16	−.04	−.06	.49
B_FLEX20	**.73**	.01	−.00	−.02	.18	.44
DISEN21	**−.63**	−.00	.07	.09	.20	.43
ENMSH22	−.09	−.08	−.08	**.42**	.02	.82
RIG23	**.63**	.11	−.25	.07	.10	.40
CHAOT24	−.01	−.11	**.69**	.05	.12	.46
B_COH25	**.75**	.07	−.04	.02	.04	.40
B_FLEX26	.00	.07	**.68**	−.20	−.07	.55
DISEN27	**−.62**	−.04	.26	.02	.17	.41
ENMSH28	**.45**	−.10	.09	**.30**	**−.34**	.62
RIG29	**−.38**	.23	.13	.24	−.21	.64
CHAOT30	.18	**−.48**	.17	**.31**	**.40**	.47
B_COH31	**.67**	.17	−.07	.04	.01	.45
B_FLEX32	**.31**	**.57**	−.18	.00	.06	.46
DISEN33	−.16	.05	−.01	−.00	**.68**	.52
ENMSH34	−.25	.04	−.10	**.61**	−.10	.56
RIG35	−.01	**.75**	−.06	.06	−.05	.41
CHAOT36	.04	.03	**.71**	.08	.06	.51
B_COH37	**.67**	.01	.03	−.17	.05	.51
B_FLEX38	**.75**	−.03	−.04	−.14	.12	.37
DISEN39	.02	.09	.17	.04	**.53**	.69
ENMSH40	−.03	.16	.02	**.64**	.04	.55
RIG41	**−.34**	**.41**	.08	.18	−.06	.68
CHAOT42	**−.54**	−.02	**.35**	.11	−.04	.41
Cronbach's α	.39	.56	.76	.48	.20	
M	3.11	2.84	2.24	2.07	2.72	
SD	0.95	0.48	0.22	0.43	0.46	

Note. B_COH = Balanced Cohesion, B_FLEX = Balanced Flexibility; DISEN = Disengaged, ENMSH = Enmeshed, RIG = Rigid; CHAOT = Chaotic. Loadings ≥ .30 are highlighted in bold.

Table 4. Final Pattern Matrix After Oblique Rotation, Reliability, and Descriptive Indicators

A priori factor and item number	F1	F2	F3	F4	F5	Uniqueness
B_COH7	.83					.34
B_COH13	.81					.36
B_COH25	.75					.39
B_COH1	.73					.44
B_FLEX20	.73					.42
B_COH19	.72					.49
B_FLEX38	.72					.38
B_FLEX2	.69					.55
B_COH31	.67					.46
RIG23	.64					.40
B_COH37	.63					.45
B_FLEX8	.58					.64
B_FLEX14	.52					.51
ENMSH28	.49					.65
RIG5		.84				.28
RIG11		.82				.34
RIG35		.75				.40
RIG17		.54				.59
RIG41		.40				.66
CHAOT36			.71			.48
CHAOT24			.71			.44
B_FLEX26			.69			.53
CHAOT18			.53			.54
CHAOT6			.43			.52
CHAOT42			.36			.41
ENMSH40				.74		.44
ENMSH34				.66		.52
ENMSH22				.49		.76
ENMSH10				.47		.67
DISEN33					.76	.41
DISEN39					.70	.50
CHAOT30					.40	.57
Cronbach's α	.90	.74	.76	.52	.37	
M	3.83	2.64	2.24	1.79	3.02	
SD	0.46	0.41	0.22	0.27	0.46	
Skewness	-0.10	-0.01	0.09	0.26	0.00	
Kurtosis	0.09	-0.12	-0.04	0.29	-0.04	
Min	1	1	1	1	1	
Max	5	4.6	4.7	4.3	5	

Note. B_COH = Balanced Cohesion, B_FLEX = Balanced Flexibility; DISEN = Disengaged, ENMSH = Enmeshed, RIG = Rigid; CHAOT = Chaotic; F1 = Balanced cohesion and flexibility; F2 = Rigid; F3 = Chaotic; F4 = Enmeshed; F5 = Disengaged.
Loadings below .3 are not reported in this Table.

Of the six items belonging to the third factor, five measured Chaotic Flexibility, and one measured Balanced Flexibility. The fourth factor had four items, all of which belonged to the Enmeshed scale. Finally, the Cronbach's alpha of the last factor did not reach the acceptable range and had only three items: two that measured Disengaged and one belonging to the Chaotic scale.

These results show that the five-factor instrument structure was confirmed; that is, the proposed original instrument of FACES IV (Olson, 2011) was not verified.

Internal Consistency and Aggregated Scores

The reliability analysis of FACES IV revealed varying levels of internal consistency (see Table 4). Balanced Cohesion and Flexibility (F1) demonstrated high internal consistency, with a Cronbach's α coefficient of .90, indicating a very reliable measurement scale. Rigid (F2) and Chaotic (F3) also achieved satisfactory reliability levels, with Cronbach's α values of .74 and .76, respectively, suggesting an acceptable internal consistency for these factors. On the other hand, Enmeshed (F4) showed a lower Cronbach's α value of .52, indicating poor but still somewhat acceptable reliability. However, Disengaged (F5) yielded a very low Cronbach's α value of .37, signaling insufficient internal consistency. Given the low Cronbach's α for the Disengaged factor, this dimension demonstrates inadequate internal consistency and, therefore, cannot be reliably used in further analyses. As a result, the Disengaged factor was excluded from subsequent analyses. The reliability analysis for the Family Communication Scale (α = .93) and Family Satisfaction Scale (α = .94) demonstrated a strong reliability (Table 2).

The total score for each scale was calculated using the mean. The data showed slight deviations from the normal distribution based on skewness and kurtosis values (Table 2 and Table 4).

Correlations Between Dimensions

Most of the correlations among the dimensions under consideration aligned with the anticipated direction (Table 5). Balanced Cohesion and Flexibility were negatively correlated with Chaotic and Enmeshed, while positively correlated with Rigid to a negligible extent. Rigid was positively correlated with Enmeshed, although to a negligible extent. Interestingly, the Unbalanced Cohesion scale of Enmeshed was positively and weakly correlated with the Unbalanced Flexibility scale of Chaotic.

Correlation with Communication, Satisfaction and Demographics

As anticipated, communication and satisfaction showed a positive correlation with balanced levels of cohesion and flexibility, and a negative correlation with Chaotic and Enmeshed. A negative correlation between Communication, Satisfaction and Rigid was anticipated. However, no significant correlation was found between communication and unbalanced scales (Table 5).

Lastly, we examined the relationship between sociodemographic characteristics (age and sex) and the five dimensions of FACES IV. Regarding age, we examined its correlation with the latent dimensions. A statistically significant positive but negligible correlation was found between age and Balanced Cohesion and Flexibility ($\rho = .14$; $p = .001$). In other words, with increasing age came an increased assessment of family balance (cohesion and flexibility). Concerning sex, there were no correlations on any FACES IV scale ($\rho_1 = .04$, $p = .342$; $\rho_2 = .08$, $p = .702$; $\rho_3 = .05$, $p = .244$; $\rho_4 = .05$, $p = .232$; $\rho_5 = .03$, $p = .504$). The men and women equally assessed family functioning at balanced and unbalanced levels of cohesion and flexibility.

Table 5. Zero-Order Correlations Among Dimensions

Factor	1. Balanced Cohesion and Flexibility	2. Rigid	3. Chaotic	4. Enmeshed	5. Communication	6. Satisfaction
1. Balanced Cohesion and Flexibility	—					
2. Rigid	.14**	—				
3. Chaotic	−.55**	−.09	—			
4. Enmeshed	−.26**	.14**	.29**	—		
5. Communication	.81**	.02	−.50**	−.27**	—	
6. Satisfaction	.78**	.02	−.50**	−.29**	.86**	—

*$p < .05$; **$p < .01$; $N = 528$.
Note. The reported correlations correspond to Spearman's rho values.

Discussion

The purpose of the current study was to validate the Croatian version of the FACES IV Package, an instrument designed to evaluate both adaptive and maladaptive family functioning. The CFA results revealed notable issues with the six-factor structure of the model of FACES IV compared to Olson (2011). The original instrument's metric characteristics showed a well-fitted model for six factors, whereas our validation did not show a good fit, even for five factors. The model fit was, however, acceptable for the Family Communication and Family Satisfaction Scales. Given the relatively small convenience sample in this study, its results are considered preliminary and require further investigation.

We conducted an EFA, aiming to find a reduced set of items that would provide a satisfactory factor structure and create a reliable scale for measuring family cohesion and flexibility, resulting in the extraction of five factors.

Compared to the original model, the Balanced Cohesion scale items were retained in full. In the Balanced Flexibility, Rigid, and Chaotic scales, six of the original seven items per scale were retained. Five items were retained for the Enmeshed scale; for the Disengaged scale, less than a third of the original items were retained.

The results of this validation indicated that the first factor comprised a combination of items that, in the original instrument, constitute two distinct dimensions: Balanced Cohesion and Balanced Flexibility. It is reasonable to conclude that merging these two dimensions into a single factor is appropriate, given that both dimensions represent the concept of balance. Koutra et al. (2013) found a similar result. In their validation, Balanced Cohesion and Balanced Flexibility merged, and two items from the Disengaged dimension migrated to this factor. The item that most accurately represented this factor, as indicated by the highest factor loading, is B_COH7 ("Family members feel very close to each other"). The item ENMSH28 ("We feel too connected to each other") did not align with the extracted first factor according to the original structure, in which it is part of the Enmeshed scale. It is noteworthy that this item's factor loading was the lowest within the first factor and was generally low. The specified item from the Enmeshed scale may not be perceived as negative within Mediterranean cultures, where the intertwining of family members is seen as culturally integral and desirable for family functioning. This underscores the necessity of considering cultural and social factors when interpreting family functioning outcomes. Enmeshed families, characterized by high emotional connectedness, may be viewed positively, as they highlight the importance of familial bonds and support (Vegas et al., 2022).

The second extracted factor, Rigid, comprised five of the seven items from the original model. One item from the Rigid scale migrated to the first factor (Balanced Cohesion and Flexibility), while another was excluded entirely during the final structure refinement due to insufficient loading. The two items that most accurately represented this factor in the final factor structure were RIG5 ("There are strict consequences for breaking the rules in our family") and RIG11 ("There are clear consequences when a family member does something wrong"). The item contributing the least to this factor was RIG41 ("Once a decision is made, it is very difficult to modify that decision").

Chaotic, identified as the third factor, comprised six of the seven original items. One item migrated to the fifth factor. Overall, the items exhibited high factor loadings, with the highest loading observed for CHAOT36, which states, "Our family has a hard time keeping track of who does various household tasks." The item with the lowest representation of this factor was CHAOT42 ("Our family feels hectic and disorganized"). Surprisingly, this factor included an item that, both originally and contextually, did not belong. This item, B_FLEX26 ("We shift household responsibilities from person to person"), exhibited a high loading. A potential explanation for the misclassification of this item within this factor may be attributed to its problematic translation. In Croatian, the item appears to align with the concept of Balanced Flexibility, since it can be interpreted as implying that household responsibilities are equitably distributed among family members.

The fourth factor represented the latent dimension of Enmeshed, with only four items retained from the original model. One item (ENMSH28) was moved to the first factor (Balanced Cohesion and Flexibility), and two items were excluded due to low loadings (< .30). Furthermore, all the retained items had relatively low loadings, ranging from .47 to .74. The item that best represented this factor was ENMSH40 ("Family members feel guilty if they want to spend time away from the family"). It is also worth noting that the Cronbach's alpha for this factor was fair (.52). However, this factor was the only one that was "pure" in terms of content (i.e., it only consisted of items that originally belonged to this dimension and, unlike the other extracted factors, did not contain any items from other dimensions).

The fifth and final factor proved to be the most problematic due to the exceptionally low number of retained items (three), only two of which corresponded to the original model (DISEN33 and DISEN39). One item,

CHAOT30, belongs to the Chaotic dimension and contributed minimally to this factor. Items that were not retained in this factor, although they originally belonged to it, had exceptionally low loadings. Another indicator of this factor's problematic nature proved to be the poor Cronbach's alpha (.37), which is probably partly due to the small number of items in this factor (Siswaningsih et al., 2017). Therefore, this study's results suggest that the Croatian version of the FACES IV was not able to measure the disengaged dimension of unbalanced cohesion.

Regarding the correlation analysis between the dimensions, most of the correlations among the dimensions were statistically significant, although some showed a negligible correlation size. Balanced Cohesion and Flexibility were statistically negatively correlated with the Chaotic dimension, consistent with the findings from the Spanish (Vegas et al., 2022), Greek (Koutra et al., 2013), Italian (Everri et al., 2020), and Portuguese (Gouveia-Pereira et al., 2020) validations and partially consistent with the original validation (Olson, 2011). However, in this study, the Balanced dimensions converged, precluding a comprehensive comparison with previous validations of the model.

Concerning the correlation between Balanced Cohesion and Flexibility and Enmeshed, the results of this validation indicated a negative correlation. This finding is consistent with Olson's original model validation and Everri et al.'s (2020) study. However, it contrasts with the results of other validations, such as those by Vegas et al. (2022), Gouveia-Pereira (2020), and Koutra et al. (2013).

The most significant discrepancies in the results were observed in the correlations of the Unbalanced extreme scales. Previous studies have demonstrated a wide range of correlations between the Rigid and Chaotic scales, varying from negative to positive correlations and including instances of no correlation (e.g., Everri et al., 2020; Gouveia-Pereira et al., 2020; Koutra et al., 2013; Olson, 2011; Vegas et al., 2022). The most coherent results were obtained by the researchers who validated the Spanish version of the model. Specifically, the correlation between the Unbalanced scales was found to be negative (Vegas et al., 2022). This finding is logical when interpreted as follows: the more rigid the family is assessed to be, the less chaotic it is.

In the context of examining the relationship between communication, satisfaction and the other scales within the FACES IV model, the anticipated results were observed. Specifically, a positive correlation was identified between Communication and the Balanced scales, aligning with previous validations (Everri et al., 2020; Gouveia-Pereira et al., 2020; Koutra et al., 2013; Vegas et al., 2022). Notably, similar correlation results were found for the Satisfaction scale. These findings are coherent, as it suggests that improved communication among family members is associated with a higher perceived level of successful family functioning. Balanced family functioning, encompassing cohesion and flexibility, signifies a healthy family system. Balanced cohesion involves strong emotional bonds, while balanced flexibility denotes the family's adaptability. Harmony in these areas allows families to navigate challenges and resolve conflicts effectively. Effective communication, when positive and supportive, enhances family satisfaction and contributes to balanced family functioning. This leads to overall well-being and healthy dynamics within the family unit.

Simultaneously, the findings demonstrating a strong negative correlation between the Communication scale and the Chaotic factors are consistent with previous validations, and the same pattern is observed for the Satisfaction scale (Gouveia-Pereira et al., 2020; Vegas et al., 2022). This outcome was anticipated.

The negative correlation of family communication and satisfaction with Enmeshed can be explained within the conceptual framework of family dynamics and functionality. Enmeshed denotes a family state in which boundaries between members are blurred, leading to excessive emotional attachment, lack of individual autonomy, and difficulties in maintaining personal boundaries. In terms of communication, enmeshment is linked to patterns that encourage excessive emotional attachment and unclear boundaries. Enmeshed families often display communication patterns that foster excessive concern for other members, lack of privacy, and challenges in setting healthy boundaries (Gouveia-Pereira et al., 2020). Considering these characteristics, it is reasonable that they are also associated with lower satisfaction levels.

Although prior validations have identified correlations (both negative and positive) between Communication and Rigid, the present validation did not observe such relationships.

Furthermore, a strong positive correlation was observed between the Communication and Satisfaction scales. This finding is consistent with previous studies (Bandura et al., 2011; Ljubetić et al., 2020). The result can be interpreted as evidence that effective communication is a critical component of healthy family functioning. It is reasonable to hypothesize that families in which members rate their communication positively are more likely to demonstrate harmonious functioning, which in turn contributes to higher levels of satisfaction.

Finally, the validation process revealed certain difficulties, including the low reliability of some factors, a significant number of excluded items, and the interweaving of different dimensions, indicating potential issues with

the instrument. These difficulties are likely due to sociocultural characteristics distinct from those of the original American model.

Our contextual approach demonstrated that perceptions of family functioning are influenced by cultural norms, values, and expectations, underscoring the critical role of sociocultural context in evaluating family dynamics. Over the past 30 years, Croatian society has experienced significant changes, including the transition from a single-party socialist system to a multi-party democracy, war, and accession to the European Union. Croatia's current social landscape reflects a mix of traditional and modern elements, resulting in a complex societal structure. These factors have contributed to Croatia's evolution from a transitional society to a mixed one, blending traditional, modern, and globalized influences in its contemporary social fabric (Tomić-Koludrović & Petrić, 2007).

These societal elements are mirrored in family dynamics. Social changes and instabilities can significantly impact various aspects of family functioning and the division of family roles (individual needs versus family needs). Such profound changes in Croatian society directly affect family complexity. The sociocultural context specifically determines the roles and responsibilities of family members (Jokić & Ristić Dedić, 2023). Traditionally, Croatian society and families have been described as collectivist, similar to Latin American cultures, which are characterized by the open expression of emotions. Family members in these cultures may reveal love, joy, sadness, or anger very expressively, fostering a sense of closeness and connection, as emotions are freely shared and processed. However, as Croatian society transitions, some validation results indicated elements of an individualistic culture, such as a negative correlation between the Enmeshed factor and Communication. Family members may perceive communication as less effective if they feel overly intertwined with others due to a lack of autonomy and a desire for greater individuality. In individualistic cultures, family members have more freedom to express their opinions, desires, and interests, promoting the development of individual identities. Family relationships in these cultures are often less hierarchical and more focused on mutual respect and cooperation than on traditional roles and expectations (Cifrić et al., 2013).

Understanding the sociocultural context is therefore essential for interpreting family dynamics and gaining insights into various behavioral patterns within the family. Additionally, changes in sociocultural identity, such as globalization, migration, or social shifts, can influence traditional family relationships and practices (Cifrić et al., 2013).

Strengths and Limitations

One of this study's strengths is that the sample represents the general population, rather than being restricted to young individuals or adolescents, as in previous validations (i.e., Everri et al., 2020; Gouveia-Pereira et al., 2020). The study's high participation rate of 99.6% indicates robust participant engagement and a high willingness to contribute to the research.

The research demonstrates methodological rigor throughout the validation and reliability testing of the assessment scales utilized. The instrument used in the study was translated and adapted in accordance with standardized procedures, thereby ensuring consistency and reliability in the adaptation process. Rigorous procedures were implemented at all stages of the analysis, including assessments of construct and convergent validity.

An additional strength of this research is the validation of an instrument that had already been used in the Croatian context, but not previously undergone a validation process. By validating the FACES IV Package within the national context, this research enriches the field of family psychology and pedagogy. The validation findings have practical implications for parents, educators, and mental health professionals working with families. This research significantly contributes to the existing literature on family dynamics. The findings offer new perspectives and insights that can inform future research and interventions.

The limitations of this study primarily apply to the sample. The sample was convenient and non-representative, with the participants predominantly being young and unmarried. This lack of representativeness may restrict the findings' generalizability to the broader Croatian population.

A significant methodological limitation of the study is its reliance on self-reported data without incorporating perspectives from other family members. This introduces the potential for bias, as the perceptions reported by one family member may be subjective and differ from those of other family members. Including multiple perspectives, such as those of parents or siblings, would provide a more comprehensive and balanced understanding of family functioning.

Another limitation concerning the sample is the lack of information on whether the participants came from clinical or non-clinical families. Furthermore, data on the participants' ethnic and national backgrounds is lacking. The question about the participants' ethnic background was not included in the questionnaire's Croatian version, as it was assumed that Croatian society is homogenous. However, it is recommended that this question be reinstated.

Additionally, another limitation of this study is the varying number of items in the FACES IV final structure, which complicates the calculation of ratio scores. This inconsistency in the number of items across the FACES IV impedes the ability to use ratio scores for comparative and analytical purposes across different scales or subscales. Thus, the accurate computation of ratio scores, which provide relative comparisons between variables, is rendered difficult. Consequently, this leads to challenges in interpreting and comparing results across the dimensions of family functioning assessed by the FACES IV Package.

Additionally, limitations can be found in the size of the instrument and the examination of numerous dimensions, as well as the collection of data on an online platform. A risk of a superficial approach to the instrument due to the large number of items and, consequently, a risk of respondent fatigue during the questionnaire completion is possible.

Finally, there are challenges related to translation and cultural adaptation that could introduce measurement errors or affect the validity of the instrument in accurately capturing family dynamics within the Croatian context.

Conclusion, Implications and Future Directions

Based on the results gained from the CFA of the scales measuring family cohesion and flexibility, we conclude that the Croatian version of the FACES IV Package does not exhibit favorable measurement characteristics; that is, it lacks satisfactory fit parameters for the theoretical model. Even if more lenient criteria for instrument suitability were considered instead of the recommended ones, it cannot be confidently claimed that the instrument is completely suitable for implementation in the Croatian context. A potential reason can be found in the societal and cultural differences between the environment in which the instrument originated and the European (Rivero et al., 2010; Koutra et al., 2013) and Croatian contexts, as described in the discussion section.

Taking this into account, using the Croatian translation of the FACES IV instrument in its original structure without testing the model is not advised. Since the CFA showed satisfactory measurement characteristics for the Family Communication Scale and Family Satisfaction Scale, their use in the original form is recommended. For FACES IV the use of an abbreviated version could be considered, as implemented by Everri et al. (2020), who assumed that each item contributes equally to the content and face-value validity of the scales. The validation of the shortened instrument demonstrated a good fit in the validation of the model's Italian version.

In future research, it is recommended that the FACES IV Package be applied to both clinical and non-clinical samples of pairs and families to include a more diverse range of family issues (e.g., delinquency, violence, and different types of addiction) as well as individuals of diverse ethnicities and cultural backgrounds. Moreover, it is necessary to consider factors such as family size and structure, income, and the family members' level of education during sampling. Taking these factors into account, the results obtained in this research cannot be generalized to different types of families (clinical and non-clinical).

Given the lack of or very low magnitude of correlation between socio-demographic variables and the examined dimensions, conducting further comparisons among participants in different familial roles is recommended.

Additionally, we propose that multiple family members be included in studies to enable the use of polynomial regression, which can provide insights into how similarities and differences in one variable are related to another variable. For example, pairs can be used to examine how similarities and differences in the assessment of emotional connectedness between partners or siblings are related to family satisfaction.

In addition, it is advisable to include experts in the fields of psychology, pedagogy, psychotherapy, and family therapy to assess the content validity of the questionnaire, as demonstrated by Sequeira et al. (2021). Their expertise can be crucial in evaluating whether the items accurately represent the dimensions of family flexibility and cohesion being measured.

Finally, this study presents preliminary and exploratory results that suggest the FACES IV Package, in its original form, may not be suitable for the Croatian context. Given these findings and the previously mentioned limitations, it is advisable to test the FACES IV Package on a more representative or clinical sample.

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Declaration of interest statement
The authors have no conflicts of interest to disclose.

Ethical statement
This manuscript is the authors' original work.
All participants engaged in the research voluntarily and anonymously.
Their data are stored in coded materials and databases without personal data.
The research was approved by the Ethical Committee for Scientific Research at the University of Rijeka (Class: 640/01/17-01/80, registration number: 2170-24-02-17-2).

Data availability statement
Datasets presented in this article are available from the corresponding author upon reasonable request.

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References

Alić, A. (2016). Razumijevanje obiteljske dinamike posredstvom transgeneracijskog i strukturalnog modela [Understanding family dynamics through a transgenerational and structural model]. In A. Pašalić Kreso (Ed.), *Zbornik radova Odsjeka za pedagogiju, "Ka novim iskoracima u odgoju i obrazovanju"* [Proceedings of the Department of Pedagogy, "Towards new steps in education"] (pp. 152–163). Faculty of Philosophy at the University of Sarajevo.

Baiocco, R., Cacioppo, M., Laghi, F., & Tafa, M. (2013). Factorial and construct validity of FACES IV among Italian adolescents. *Journal of Child and Family Studies 22*, 962–970. https://doi.org/10.1007/s10826-012-9658-1

Bandura, A., Caprara, G. V., Barbaranelli, C., Regalia, C., & Scabini, E. (2011). Impact of family efficacy beliefs on quality of family functioning and satisfaction with family life. *Applied Psychology, 60*(3), 421–448. https://doi.org/10.1111/j.1464-0597.2010.00442.x

Bentler, P. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*(2), 238 – 246. https://escholarship.org/uc/item/2mk8r49v

Cifrić, I., Trako Poljak, T., & Klasnić, K. (2013). Hrvatski identitet u promjeni: Relacijski identiteti 2 [Croatian identity in change: Relational identities 2]. *Prikazi, Revija za Sociologija, 43*(3), 289–297. https://doi.org/10.5613/rzs.43.3.6

Comrey, A. L., & Lee, H. B. (2013). *A first course in factor analysis* (2nd ed.). Psychology Press. https://doi.org/10.4324/9781315827506

Everri, M., Caricati, L., Mancini, T., Messena, M. & Fruggeri, L. (2020). Italian Validation of Family Adaptability and Cohesion Scale (FACES IV) Short Version for Adolescents: SAD_FACES. *Journal of Child and Family Studies*, *29*, 2507–2514. https://doi.org/10.1007/s10826-020-01771-9

Gomes, H. M. S., Peixoto, F., & Gouveia-Pereira, M. (2017). Portuguese validation of the family adaptability and cohesion evaluation scale – FACES IV. *Journal of Family Studies, 25*(4), 477–494. https://doi.org/10.1080/13229400.2017.1386121

Gouveia-Pereira, M., Gomes, H., Miranda, M., & Candeias, M. J. (2020). Coesão e flexibilidade familiar: Validação do pacote FACES IV junto de adolescentes portugueses. [Family training and flexibility: Validation of the FACES IV package with Portuguese adolescents]. *Análise Psicológica* [Psychological Analysis], *38*(1), 111–126. https://doi.org/10.14417/ap.1651

Hamilton, E., & Carr, A. (2016). Systematic review of self-report family assessment measures. *Family Process*, *55*(1), 16–30. https://doi.org/10.1111/famp.12200

Hu, L-t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Jokić, B., & Ristić Dedić, Z. (2023). *Obiteljski odnosi u Republici Hrvatskoj iz perspektive mladih: Rezultati povodom međunarodnog dana obitelji* [Family relations in the Republic of Croatia from the perspective of young people: Results on the occasion of International Family Day] [Poster presentation]. International Family Day. https://tinyurl.com/3fk8xyff

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, *39*, 31–36. https://doi.org/10.1007/BF02291575

Kalkbrenner, M. T. (2021). A practical guide to instrument development and score validation in the social sciences: The MEASURE approach. *Practical Assessment, Research, and Evaluation*, *26*(1), 1–18. https://doi.org/10.7275/svg4-e671

Koutra, K., Triliva, S., Roumeliotaki, T., Lionis, C., & Vgontzas, A. N. (2013). Cross-cultural adaptation and validation of the Greek version of the Family Adaptability and Cohesion Evaluation Scales IV Package (FACES IV Package). *Journal of Family Issues*, *34*(12), 1647–1672. https://doi.org/10.1177/0192513X12462818

Lee, M. S. (2014). Consideration of the appropriateness of Korean FACES IV focused on the process of translating a scale. *Korean Journal of Physical Multiple & Health Disabilities*, *57*(2), 23–44. https://doi.org/10.20971/kcpmd.2014.57.2.23

Ljubetić, M., Reić Ercegovac, I., & Mandarić Vukušić, A. (2020). Percepcija obiteljske komunikacije adolescenata i njihovih roditelja – Rezultati preliminarnog istraživanja modela [Perception of family communication of adolescents and their parents – Results of preliminary model research]. *Nova Prisutnost: Časopis za Intelektualna i Duhovna Pitanja* [New Presence: Journal of Intellectual and Spiritual Issues], *18*(2), 279–292. https://doi.org/10.31192/np.18.2.4

Mirnics, Z., Vargha, A., Tóth, M., & Bagdy, E. (2010). Cross-cultural applicability of FACES IV. *Journal of Family Psychotherapy, 21*(1), 17–33. https://doi.org/10.1080/08975351003618577

Nacionalno etičko povjerenstvo za istraživanje s djecom [National Ethics Committee for Research with Children]. (2020). *Etički kodeks istraživanja s djecom* [Ethical Code for Research with Children]. https://mrosp.gov.hr/istaknute-teme/obitelj-i-socijalna-politika/obitelj-12037/djeca-i-obitelj-12048/nacionalno-eticko-povjerenstvo-za-istrazivanje-s-djecom/12191

Olson, D. H. (2000). Circumplex model of marital and family systems. *Journal of Family Therapy*, *22*(2), 144–167. https://doi.org/10.1111/1467-6427.00144

Olson, D. H. (2010). *Family Satisfaction Scale.* Life Innovations.

Olson, D. (2011). FACES IV and the Circumplex Model: Validation study. *Journal of Marital and Family Therapy*, *37*(1), 64–80. https://doi.org/10.1111/j.1752-0606.2009.00175.x

Olson, D., & Gorall, D. M. (2003). Circumplex model of marital and family systems. In F. Walsh (Ed.), *Normal family processes: Growing diversity and complexity* (3rd ed., pp. 514–548). The Guilford Press.

Olson, D., Gorall, D. M., & Tiesel, J. (2006). *Faces IV and the Circumplex Model.* Life Innovations.

Olson, D. H., Sprenkle, D. H., & Russell, C. S. (1979). Circumplex model of marital and family systems: I. Cohesion and adaptability dimensions, family types, and clinical applications. *Family Process*, *18*(1), 3–28. https://doi.org/10.1111/j.1545-5300.1979.00003.x

Rada, C. (2018). Latent class analysis approach for the Family Adaptability and Cohesion Evaluation Scale IV among young people from Romania: The first step for validation. *Journal of Family Issues, 39*(6), 1598–1615. https://doi.org/10.1177/0192513X17714508

Rivero, N., Martínez-Pampliega, A., & Olson, D. H. (2010). Spanish adaptation of the FACES IV questionnaire: Psychometric characteristics. *The Family Journal*, *18*(3), 288–296. https://doi.org/10.1177/1066480710372084

Sanderson, J., Kosutic, I., Garcia, M., Melendez, T., Donoghue, J., Perumbilly, S., Franzen, C. & Anderson, S. (2009). The measurement of outcome variables in couple and family therapy research. *American Journal of Family Therapy*, *37*(3), 239–257. https://doi.org/10.1080/01926180802405935

Schumacker, R. E., & Lomax, R. G. (2016). *A beginner's guide to structural equation modeling* (4th ed.). Routledge.

Sequeira, J., Vicente, H. T., Daniel, F., Cerveira, C., Silva, M. I., Neves, S., Espírito Santo, H., & Guadalupe, S. (2021). Family Adaptability and Cohesion Evaluation Scale–Version IV (FACES IV): Validation study in the Portuguese population. *Journal of Child and Family Studies*, *30*, 1650–1663. https://doi.org/10.1007/s10826-021-01941-3

Siswaningsih, W., Firman, H., & Khoirunnisa, A. (2017). Development of two-tier diagnostic test pictorial-based for identifying high school students misconceptions on the mole concept. *Journal of Physics: Conference Series*, *812*, Article 012117. https://doi.org/10.1088/1742-6596/812/1/012117

Steiger, J. H. (2007). Understanding the limitations of global fit assessment in structural equation modeling. *Personality and Individual Differences, 42*(5), 893 – 898. https://doi.org/10.1016/j.paid.2006.09.017

Tomić-Koludrović, I., & Petrić, M. (2007). Hrvatsko društvo-prije i tijekom tranzicije [Croatian society-Before and during the transition]. *Društvena istraživanja* [Social Research], *16*(4–5), 867–889.

Vegas, M. I., Mateos-Agut, M., Pineda-Otaola, P. J., & Sebastián-Vega, C. (2022). Psychometric properties of the FACES IV package for Spanish adolescents. *Psicologia: Reflexão e Crítica*, *35*, Article 18. https://doi.org/10.1186/s41155-022-00222-2

Watkins, M. W. (2018). Exploratory factor analysis: A guide to best practice. *Journal of Black Psychology, 44*(3), 219–246. https://doi.org/10.1177/0095798418771807

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RESEARCH ARTICLE

From Family Conflicts to Suicide Risk Through Deliberate Self-Harm Online Content in Adolescents and Young Adults

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Introduction: Family conflicts are considered a risk factor for deliberate self-harm (DSH) and even suicidal thoughts and behaviors. Research also shows that adolescents are increasingly engaging in online DSH activities. However, studies on this topic are scarce.
Aims: This study's first goal is to replicate the effect of family conflicts on suicidal ideation (SI) and, according to the gateway theory, include DSH diversity as a step preceding SI. Second, we aim to consider online activities in understanding suicidal risk. We start by describing online DSH activities, and propose a sequential mediation model in which family conflicts predict DSH and SI through online DSH activities.
Methods: The convenience sample of this cross-sectional study consisted of 357 adolescents and young adults between 12 and 22 years old who completed a self-report questionnaire measuring family conflicts, online DSH activities, identification with DSH-related content creators, DSH, and suicidal ideation.
Results: The results showed that 85.3% of our community sample used the internet for DSH-related purposes. Results also revealed an independent mediation effect of DSH diversity on the relationship between family conflicts and SI, and a sequential mediation effect of online DSH activities, identification, and DSH diversity.
Conclusions: Engaging in online DSH activities is only predictive of DSH or SI if adolescents perceive a shared identity with this community of creators. The findings might yield implications regarding the design of prevention strategies that include a further supervision of online platforms and psychological interventions that incorporate the family system and peers.

Keywords: adolescents, deliberate self-harm, suicidal ideation, family conflicts, online

Introduction

Deliberate Self-Harm, Family Conflicts, and Online DSH Activities

Deliberate self-harm (DSH) has become more prevalent in adolescents over the last decades (e.g., Gaspar et al., 2022; Hawton et al., 2012; Zetterqvist et al., 2021). Nationally, the prevalence of these behaviors among adolescents ranges between 7% and 40.8% (Duarte et al., 2020; Gaspar et al., 2022; Guerreiro et al., 2017; Nobre-Lima et al., 2017). DSH are non-fatal and self-aggressive behaviors, regardless of suicidal intent (Duarte et al., 2019; Gouveia-Pereira et al., 2022; Madge et al., 2008). These behaviors are often understood as part of a spectrum, arranged according to their severity (i.e., level of physical harm caused by each method of DSH), and according to the Gateway Theory, they might be an entry point to a wider spectrum of suicidal thoughts and behaviors (STBs)

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(Grandclerc et al., 2016; Hamza et al., 2012). The diversity of these behaviors (i.e., number of DSH methods) and suicidal ideation (SI) (i.e., thoughts or willingness to commit suicide) is also a predictor of suicide attempts (SA) (Duarte et al., 2019; Duarte et al., 2020; Gouveia-Pereira et al., 2022; Hawton et al., 2012).

Regarding the predictors of these STBs, higher family conflict is one of the risk factors and major reasons, presented by young people, to engage in DSH (Aggarwal et al., 2017; Dieserud et al., 2010; Gulbas et al., 2015; Naz et al., 2021; Nicolopoulos et al., 2018; O'Brien et al., 2021; Simes et al., 2022; Syed & Khan, 2008). Indeed, it is known that parent-adolescent disagreements and conflicts are a normal part of family relationships during the stage of adolescence, as they are necessary for the development of new boundaries within the family system, facilitating the adolescent's individuation, autonomy, and differentiation processes (Blos, 1979; Branje, 2018; Steinberg, 2001; Weymouth et al., 2016). However, when this disagreement is marked by fighting and aggression, or when too many conflicts arise, it may affect an adolescent's psychosocial adjustment and well-being (Branje, 2018; Weymouth et al., 2016). Indeed, some adolescents tend to internalize familial conflicts, leading to feelings of being guilty, unloved, and rejected, as well as beliefs of thwarted belongingness and perceived burdensomeness, contributing to considering engaging in DSH and STBs to escape these painful feelings (Kalpakci et al., 2014; Sands & Dixon, 1986).

Besides, when young people feel a lack of social and parental support and are unable to rely on the family system, a sense of belongingness can be searched for and supplemented in the online context (Gámez-Guadix, 2022). Moreover, the internet is a space where individuals can express thoughts, emotions and psychological distress that they have difficulty expressing in the real world (Adams et al., 2005; Bargh et al., 2002; Margherita & Gargiulo, 2018). Concerning DSH, research shows that some adolescents feel isolated, non-accepted, stigmatized, and ashamed of their behaviors, navigating online to find similar others to fulfill their support needs (Dyson et al., 2016; Lavis & Winter, 2020; Seko et al., 2015; Simone & Hamza, 2020). Online representations of these behaviors have been growing (e.g., Biernesser et al., 2020; Duggan et al., 2012; Dyson et al., 2016; Frost et al., 2016; Lee et al., 2022; Lewis et al., 2012; Marchant et al., 2017), and there are several possible online activities connected with DSH (i.e., viewing, creating, and sharing content related to DSH; talking online about these behaviors with online or offline peers). These activities can occur on different platforms, such as social media (e.g., Instagram), messaging applications (e.g., WhatsApp), video platforms (e.g., TikTok), and discussion forums (e.g., Reddit) (Adler & Adler, 2008; Baker & Fortune, 2008; Brown et al., 2018, 2020; Giordano et al., 2022; Lavis & Winter, 2020; Lewis & Seko, 2016; Logrieco et al., 2021; Nesi et al., 2021; Rodham et al., 2007; Whitlock et al., 2006). Worldwide, research has only recently started to highlight online DSH activities on contemporary and adolescents' popular social media (e.g., Instagram) (Arendt et al., 2019; Brown et al., 2018, 2020; Giordano et al., 2022; Nesi et al., 2021), and we found no national studies that focused on DSH-related internet use.

Online DSH Activities, Identification with DSH-Related Content Creators, DSH Diversity, and Suicidal Ideation

A growing body of evidence has been showing that DSH online representations sometimes lead to imitation, contagion, social comparisons and competitions, normalization, triggering effects, reinforcement, DSH maintenance, and increased SI risk (Arendt et al., 2019; Baker & Lewis, 2013; Biernesser et al., 2020; Brown et al., 2020; Campaioli et al., 2017; Dyson et al., 2016; Jacob et al., 2017; Lewis & Baker, 2011; Lewis & Seko, 2016; Marchant et al., 2017; Nesi et al., 2021; Rodham et al., 2007; Seong et al., 2021; Zhu et al., 2016). Previous studies also indicate higher levels of suicidality in those who use the internet for suicide and DSH-related reasons (e.g., Bell et al., 2018; Frost & Casey, 2016; Lee et al., 2022; Seong et al., 2021).

Research has also suggested that sometimes online DSH activities or a DSH community culture resource integrate adolescents' identity, which can increase the risk of DSH, contribute to its maintenance and higher severity, as well as the risk of STBs (Adler & Adler, 2008; Campaioli et al., 2017; Jacob et al., 2017; Nesi et al., 2021; Sternudd, 2012). Indeed, adolescence is considered a critical period for identity development, which is formed through the process of belonging to and identifying with social groups (Tajfel & Turner, 1979). Therefore, some adolescents and young adults feel the need to increase the severity of their behaviors to gain the right to claim the self-injurer identity; otherwise, feelings of being rejected might emerge (Jacob et al., 2017; Sternudd, 2012). Prior studies have not addressed quantitatively the degree of young people's identification with DSH-related content creators, which might have a considerable impact on the relationship between online DSH activities, DSH, and SI in vulnerable adolescents and young adults. This seems particularly important since past studies have found differences in suicidality risk between those who only view DSH content and those who post their DSH content online, where posting content can be associated with an increased risk of suicide, while just passively viewing is not related to suicide risk - after considering other variables (Seong et al., 2021). Similarly, it is possible that those

who also identify themselves with DSH content creators, in search for a sense of belongingness, are at a higher risk on the continuum of suicidality than those who simply engage in online DSH activities, particularly when having a conflictual familial environment that does not satisfy these belongingness needs.

The Current Study

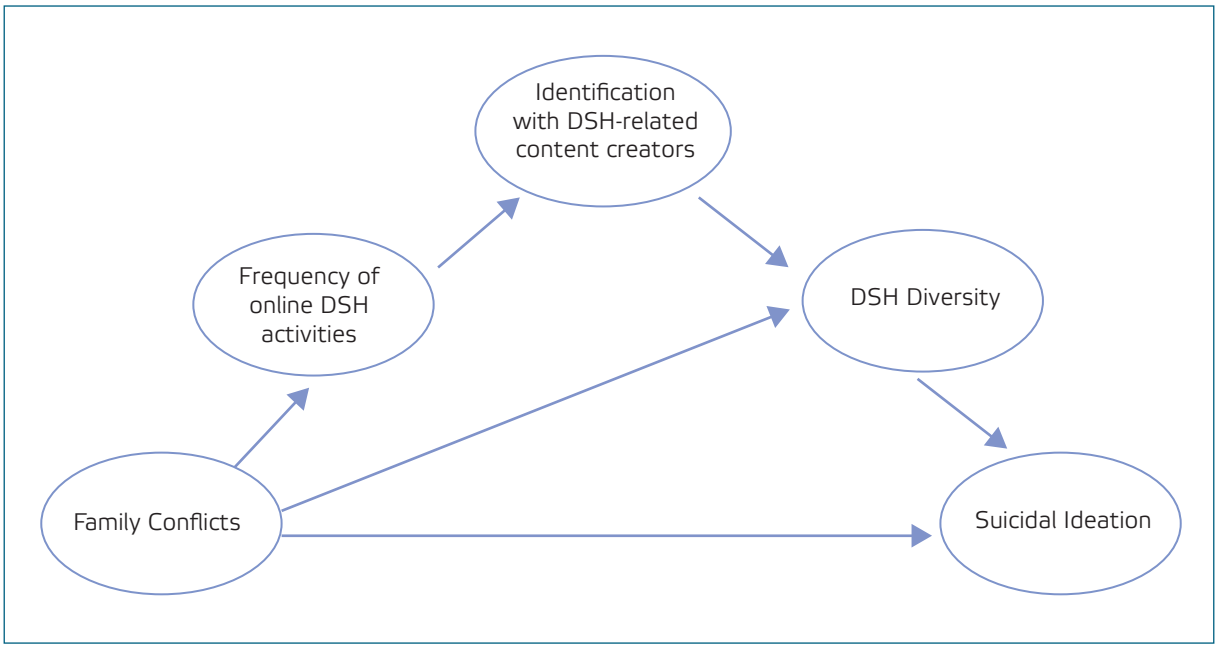
In line with the aforementioned, since the studies that focused on this topic are still scarce, particularly in Portugal, our first goal is to describe online DSH activities (viewing, creating, and sharing DSH online content; communicating online about DSH with people known online or offline) regarding their frequencies and the platforms used in a sample of adolescents and young adults (Objective 1).

Two more goals were defined and are further discussed. It is well established that family conflicts are a major predisposing risk factor, and underlying reason for engaging in DSH and STBs (e.g., Aggarwal et al., 2017; Dieserud et al., 2010; Gulbas et al., 2015; Naz et al., 2021; Pelkonen & Marttunen, 2003; Syed & Khan, 2008). Furthermore, research has proved associations between DSH and SI (e.g., Andover & Gibb, 2010; Duarte et al., 2020; Grandclerc et al., 2016; Guan et al., 2012), with a greater number of DSH methods (DSH diversity) being associated with an increased likelihood of lifetime suicidality (Duarte et al., 2020; Seong et al., 2021). However, some authors suggest that these behaviors might be protective against suicide, proposing an anti-suicide model (Suyemoto, 1998). As this theoretical framework still exists, we intend to replicate the effect of family conflicts on SI through the mediating role of DSH diversity, testing the Gateway Theory (Objective 2).

Research shows that the family also has an important role in young people's online risks and internet use, as these people may rely on the internet to satisfy support and emotion regulation needs that may not be met within the family (Lin, 2020; Mesch, 2006; Sela et al., 2020; Wright et al., 2021). Likewise, adolescents missing family support may use DSH-related content to increase their perceived group belongingness (Gámez-Guadix et al., 2022). It has also been shown that online DSH activities are associated with an increased risk of suicidality, including SI (Arendt et al., 2019; Nesi et al., 2021; Seong et al., 2021), and sometimes may contribute to the development of a self-harmer identity, which can lead to an amplification of the behaviors (e.g., Jacob et al., 2017). Finally, previous findings show that DSH diversity is a strong predictor of SI (e.g., Duarte et al., 2020; Gouveia-Pereira et al., 2022). Hence, our third objective is to test the previously mentioned mediation model by adding the role of online DSH activities and identification with DSH-related content creators (Objective 3, see Figure 1).

While the literature is consensual about the family risk factors that influence suicidality, including family conflicts, this is the first study, as far as we know, that tests a model that encompasses the role of online DSH activities, identification with DSH-related content creators, and DSH diversity in this relationship.

Figure 1. The Proposed Mediation Model



Method

Participants

A total of 366 students from public and professional schools participated in this study. After removing incomplete and repetitive answers (n = 8), and one participant who did not accept to participate, we composed our final sample including 357 adolescents and young adults (54.1% male; M_{age} = 16.61, SD = 1.83), mostly nationals (93.6%), who studied between the 7th and 12th grade, of whom 41.5% (n = 147) reported at least one school retention. Most participants had a history of DSH: 50.9%, with a range from one to 13 DSH methods (M = 4.12, SD = 3.14). Despite being higher, the prevalence of young people in our sample reporting a previous history of DSH appears to be similar compared to community samples of other national studies using ICAL (e.g., 40.8%, Duarte et al., 2020; 33.9%, Gouveia-Pereira et al., 2022).

Measures

Family Conflict

We used the national version of the Family Climate Inventory (FCI, Teodoro et al., 2009) to evaluate whether the relationship between parents and their children is aggressive, critical, or conflictual. Items (sample item: "People often criticize each other") were answered from 1 = *Totally disagree* to 7 = *Totally agree*. The Portuguese version (Teodoro et al., 2009) showed good levels of internal consistency (α =.84). In the current study, the measurement also presents good internal consistency (α =.82), and we computed a mean score by averaging the six items of the scale (M = 2.53, SD = 0.89).

Online DSH Activities

We developed the Online DSH Activities Questionnaire, a self-report measurement to test the frequency of the different online DSH activities. We started with a literature review (Lewis et al., 2012; Nesi et al., 2021) as well as consulting clinicians and researchers with expertise in working with adolescents with DSH. Five items questioned the frequency of viewing, sharing, and creating DSH-related content; talking online about DSH with peers also known offline, and talking online about DSH with peers only known online, which were answered on a five-point rating scale (from 1 = *Never* to 5 = *Everyday*). We carried out an exploratory factor analysis using the Maximum Likelihood factoring method with Promax rotation, and applying the Kaiser criteria to determine the number of factors. The analysis revealed a one-factor structure accounting for 41.7% of the variance, in which all items saturated (with all factor loadings greater than .52). The Kaiser-Meyer-Olkin test indicated sampling adequacy (KMO = .80), and Barlett's test of sphericity corroborated the data's suitability for this analysis (p < .001). We computed the online DSH activities index by means of averaging the five items (α = .76; M = 1.74, SD = 0.64). For each of the five items we asked the respondent which platforms they used for each activity (Instagram; TikTok; Facebook; Tumblr; Blogs; Forums; Reddit; WhatsApp; Telegram; Others), allowing the selection of more than one platform.

Identification with DSH-Related Content Creators

The Identification with DSH-related Content Creators Questionnaire is an adaptation based on the social identification scale developed by Palmonari et al. (1991) aimed at adolescents. Palmonari et al. (1991) used four identification scales, with five items each (answered from 1 = *Completely disagree* to 5 = *Completely agree*), measuring adolescents' identification with the peer group (sample item: "I feel close to my peer group"), the family (sample item: "I feel close to my family"), with the school mates (sample item: "I feel close to my school mates), and with the best friend (sample item: "I feel close to my best friend". In the present study, we have modified these scales, using only a scale related to identifying with DSH-related content creators. For that purpose, we asked the respondents to answer five items regarding the people who create online DSH-related content they consume (sample item: "I feel close to these people"), changing the items used by Palmonari et al. (1991), so that our items could refer to the people who create online DSH content. The participants answered on a five-point rating scale

(from 1 = *Completely disagree* to 5 = *Completely agree*). We computed a final index from the mean of the five items (α = .93; *M* = 2.42; *SD* = 1.07).

Deliberate Self-Harm (DSH)

The Inventory of Deliberate Self-Harm Behaviors (ICAL) is a self-report measure that was previously validated for Portuguese adolescents and indicated acceptable psychometric properties (Duarte et al., 2019). The participants were asked to indicate the lifetime frequency of 14 DSH behaviors (e.g., cutting, biting), with a four-option response format *("No", "Yes – 1 time", "Yes, 2–10 times", "Yes, more than 10 times")*. DSH diversity was ascertained after dichotomizing each DSH behavior ("0" for the absence of a lifetime history of the DSH method, "1" for the presence of a history of the DSH method) and summing all items.

Suicidal Ideation

The Suicidal Ideation Questionnaire (SIQ, Ferreira & Castela, 1999; Reynolds, 1988) is a 30-item self-report measure that assesses the frequency of suicidal thoughts (from 0 = *I never had the thought* to 6 = *Almost every day*). The original version (Reynolds, 1988) revealed a very good level of internal consistency (α = .97), and good construct validity. The Portuguese version (Ferreira & Castela, 1999) showed a very good internal consistency (α = .96) and an alpha of .76 in the test-retest reliability. In the current study, this measurement has also presented an excellent level of internal consistency (α = .98). We computed an index with the sum of all items revealing a mean of 34.50 (*SD* = 43.45), similar to the mean scores found in other studies using both a community and a clinical sample (e.g., *M* = 34.35, *SD* = 42.75, Duarte et al., 2020; *M* = 55.13, *SD* = 48.18, Gouveia-Pereira et al., 2022).

Socio-Demographic Questionnaire

The socio-demographic variables included sex, age, nationality, education (school year and the number of possible academic retentions), and others.

Procedure

This study was approved by the ISPA-Instituto Universitário Ethics Committee in Lisbon, Portugal (Registry number: I-081-5-22). Before collecting the data, we did a qualitative pre-test with six adolescents in order to verify if the questionnaire was easily understood and if further issues were mentioned by these six respondents. After this moment, the team established contact with the schools, and the principals selected different classes by convenience. After the consent forms were signed by both legal guardians and students, the researchers carried out the data collection. Questionnaires were completed during school time (approximately 30 minutes). Considering the sensitive nature of the topic and since the Investigators did not have a protocol for intervening in cases of high scores on the SIQ measure, a final section was added to the survey with various helplines and community support contacts in Portugal for suicide and DSH.

Statistical Analysis

Statistical analyses were performed using SPSS statistics and PROCESS macro for SPSS (version 4.1) (Hayes, 2022). To answer our first objective, descriptive statistics were carried out to explore the online DSH activities variables.

To test the mediation effects proposed in our second and third objectives, we started with conducting *Pearson* correlations between the variables of interest. We have checked the assumption of normal distribution using the Kolmogorov-Smirnov test, and the results revealed a non-normal distribution of all the variables ($p < .001$). However, the results did not grossly violate the normality assumption as the absolute values for skewness and kurtosis did not exceed the recommended values of two and seven respectively (Kim, 2013; Kline, 2005), thus justifying the use of the analysis. We used Model 6 in the SPSS PROCESS Macro with bootstrapping 5000 simulations to examine the significance of the indirect effects, and 95% CI_{Boot} were provided. Importantly, a given effect was considered statistically significant if both the upper and lower bond of the CI were positive (entirely above zero) or negative (entirely below zero).

Results

Describing the Frequencies of Online DSH Activities

The results revealed that viewing DSH online content was the activity that most participants stated having engaged in, with only 20.9% of all participants reporting never viewing online DSH content (see Table 1). In Table 1 it is possible to see the average frequency with which participants engaged in each online DSH activity.

Table 1. Descriptive Statistics of Online DSH Activities

			Frequency				
			% selecting option 1	% selecting option 2	% selecting option 3	% selecting option 4	% selecting option 5
Online DSH activities	*M*	*SD*	%	%	%	%	%
Viewing DSH content	2.58	1.12	20.9	25.1	35.7	11.1	7.1
Talking online with people also known offline	2.12	1.06	41.1	27.8	24.1	4.5	2.5
Talking online with people only known online	1.65	0.90	66.2	17.3	13.4	2.0	1.1
Sharing DSH content	1.47	0.83	72.0	14.2	12.2	0.3	1.4
Creating DSH content	1.20	0.59	89.0	6.2	3.7	0.3	0.8

Note. DSH: Deliberate self-harm.
% selecting option 1, 2, 3, 4, or 5 refers to the percentage of participants selecting one of the given response options.
The presented numbers pertain to the frequency of engagement in each online DSH activity, where 1 = *Never*, 2 = *Rarely*, 3 = *Sometimes*, 4 = *Almost every day*, 5 = *Everyday*.

Adolescents and young adults who had engaged in at least one of the online DSH activities (85.3%) used various platforms (see Table 2). For all the online DSH activities, Instagram was the most used platform, except for communication with people also known offline, for which the preponderant platform was WhatsApp.

Table 2. Platforms Used to Engage in Online DSH Activities

Online DSH activities	*n* (%)										
	Instagram	Tiktok	Facebook	Tumblr	Blogs	Forums	Reddit	Whats-App	Telegram	Discord	Outras
Viewed content	225 (81.2)	187 (67.5)	51 (18.4)	7 (2.5)	15 (5.4)	19 (6.9)	33 (11.9)	100 (36.1)	22 (7.9)	55 (19.9)	46 (16.6)
Talked with peers also known offline about DSH	115 (55.3)	23 (11.1)	13 (6.3)	1 (0.5)	2 (1)	2 (1)	3 (1.4)	162 (77.9)	7 (3.4)	48 (23.1)	5 (2.4)
Talked with peers only known online about DSH	69 (58)	18 (15.1)	7 (5.9)	2 (1.7)	3 (2.5)	4 (3.4)	6 (5.0)	68 (57.1)	6 (5.0)	41 (34.5)	3 (2.5)
Shared content	83 (83.8)	14 (14.1)	9 (9.1)	2 (2.0)	1 (1.0)	1 (1.0)	2 (2.0)	41 (41.4)	2 (2.0)	8 (8.1)	7 (7.1)
Created content	24 (61.5)	14 (35.9)	3 (7.7)	0 (0.0)	0 (0.0)	0 (0.0)	1 (2.6)	14 (35.9)	2 (5.1)	6 (15.4)	1 (2.6)

Note. DSH: Deliberate self-harm.

Testing the Mediation Models

Firstly, the correlation analysis (see Table 3) showed that family conflicts were moderately positively correlated with DSH diversity and SI. Likewise, the findings proved a significant strong positive correlation between DSH diversity and SI. The results also revealed a significant weak positive correlation between family conflicts and the frequency of online DSH activities; a moderate positive correlation between the frequency of online DSH activities and identification with DSH-related content creators; and a weak positive relationship between identification and DSH diversity. See Table 4 for other significant and non-significant correlations.

Table 3. Descriptive Statistics and Pearson Correlations Between Variables

Variables	*M* (*SD*)	1	2	3	4	5	Skewness	Kurtosis
(1) Family conflicts	2.53 (0.89)	-					0.33	-0.58
(2) Freq. online DSH	1.74 (0.64)	.19**	-				1.53	3.82
(3) Identification	2.42 (1.07)	.13*	.44**	-			0.21	-0.74
(4) DSH diversity	2.10 (3.04)	.33**	.10	.14**	-		1.71	2.34
(5) Suicidal ideation	34.5 (43.45)	.38**	.14*	.15**	.72**	-	1.37	0.76

Note. Freq.online DSH: Frequency of online DSH activities; Identification: Identification with DSH-related content creators; DSH diversity: Deliberate self-harm diversity
* $p < .05$, ** $p < .01$, *** $p < .001$.

Overall, the results of the regression analysis (Table 4) revealed that family conflicts were significantly positively associated with DSH diversity, which was significantly positively associated with SI. Also, the direct effect of family conflicts on SI was significant.

Furthermore, the findings showed that: (1) family conflicts were significantly positively associated with the frequency of online DSH activities; (2) the frequency of online DSH activities was significantly positively associated with the identification with DSH-related content creators; (3) the identification with DSH-related content creators was significantly positively associated with DSH diversity, bringing forth a sequential mediation pathway. No other associations between the variables were significant.

Table 4. Regression Analysis of Variable Relationship in Sequential Mediation Model

Result variable	Predictor variable	B	*t*	*p*
Freq. of online DSH	Family conflicts	.14	3.60	<.001***
Identification	Family conflicts	.06	1.01	.315
	Freq. of online DSH	.71	8.61	<.001***
DSH diversity	Family conflicts	1.09	6.12	<.001***
	Freq. of online DSH	-.05	-.17	.864
	Identification	.32	1.98	.048*
Suicidal ideation	Family conflicts	6.21	3.25	<.001***
	Freq. of online DSH	2.58	.94	.350
	Identification	.68	.41	.681
	DSH diversity	9.71	17.49	<.001***

Note. DSH: Deliberate self-harm; Freq. of online DSH: Frequency of online DSH activities; Identification: Identification with DSH-related content creators; DSH diversity: Deliberate self-harm diversity. B refers to the unstandardized regression coefficients. Due to missing data, the total sample size for de sequential mediation analysis was $N = 342$.
* $p < .05$, ** $p < .01$, *** $p < .001$.

The bootstrap test results, detailed in Table 5, revealed that both the pathways we propose in Figure 1 are significant. Specifically, the third indirect effect (i.e., the specific indirect effect of family conflicts on SI through DSH diversity) was significant, fulfilling our second objective. Furthermore, a significant indirect effect (Ind 7) of family conflicts on SI through the frequency of online DSH activities, as well as the identification with DSH-related content creators, and DSH diversity was also indicated, further satisfying the third objective. Thus, the frequency of online DSH activities, identification with DSH-related content creators, and DSH diversity partially and sequentially mediate the relationship between family conflicts and SI. No other indirect paths of influence were statistically significant.

Table 5. The Direct and Indirect Effect of Family Conflicts on Suicidal ideation

	Effects	Boot SE	Boot LLCI	Boot ULCI
Direct effect	**6.205**	**1.910**	**2.448**	**9.962**
Total indirect effect	**11.442**	**2.120**	**7.494**	**15.884**
Indirect effect 1	0.358	0.473	-0.430	1.460
Indirect effect 2	0.041	0.140	-0.236	0.362
Indirect effect 3	**10.545**	**2.092**	**6.633**	**14.902**
Indirect effect 4	0.067	0.169	-0.261	0.440
Indirect effect 5	-0.062	0.438	-0.975	0.818
Indirect effect 6	0.187	0.221	-0.217	0.665
Indirect effect 7	**0.306**	**0.194**	**0.006**	**0.754**

Note. All reported coefficients are unstandardized. Boot SE, Boot LLCI, and Boot ULCI denote the standard error, lower limit, and upper limit of the 95% confidence intervals for the indirect effects calculated using the bootstrap technique.
Indirect effect 1: F. conflicts → Freq. of online DSH → SI; indirect effect 2: F. conflicts → Identification → SI; indirect effect 3: F. conflicts → DSH diversity → SI; indirect effect 4: F. conflicts → Freq. of online DSH → Identification → SI; indirect effect 5: F. conflicts → Freq. of online DSH → DSH diversity →SI; indirect effect 6: F. conflicts → identification → DSH diversity → SI; indirect effect 7: F. conflicts → Freq. of online DSH → identification → DSH diversity → SI

Discussion

Description of DSH Online Activities

A considerable proportion of the community sample reported having practiced at least one of the online DSH activities. The participants engaged frequently in viewing online DSH content, followed by communicating online with people also known offline and with people only known online. Similarly, Nesi et al. (2021) found that talking online with offline peers was the predominant activity, followed by viewing content, talking online with online peers, and, finally, sharing online DSH content. The online nature of these interactions might be appealing because adolescents probably feel free to share their suffering without the weight of inhibitions inherent in face-to-face encounters (Adams et al., 2005).

Young people mostly used Instagram and WhatsApp for DSH-related online activities. Despite some important work on Instagram (e.g., Arendt et al., 2019; Brown et al., 2018, 2020; Giordano et al., 2021) a large body of research focused on forums or websites specifically developed to address these behaviors (e.g., Lewis & Seko, 2016; Whitlock et al., 2006). Only a small number of participants in this study endorsed using those sites. Thus, research that explores online DSH representations in more modern and popular social media (e.g., Instagram, WhatsApp, TikTok) is needed, as already suggested by Nesi et al. (2021).

The Role of DSH Diversity in the Relationship Between Family Conflicts and SI

The links we found between family conflicts, DSH diversity, and SI, are in accordance with past findings demonstrating that family conflict is a predictive and explanatory variable of DSH and STBs (Aggarwal et al., 2017; Dieserud et al., 2010; Gulbas et al., 2015; Naz et al., 2021; Nicolopoulos et al., 2018; O'Brien et al., 2021; Pelkonen & Marttunen, 2003; Simes et al., 2022; Syed & Khan, 2008). Also, consistent with previous research, DSH diversity is positively associated with an increased SI (e.g., Duarte et al., 2020; Gouveia-Pereira et al., 2022). Overall, the findings examine and can be contextualized through the Gateway Theory, suggesting that DSH precedes a broader spectrum of STBs (Grandclerc et al., 2016; Hamza et al., 2012). By including family conflicts, our results also contribute to the literature and advance the knowledge regarding the Gateway Theory, illuminating the contextual factors that precede the association between DSH and SI. Indeed, the mediation analysis confirmed a significant path of influence between these variables (i.e., family conflicts → DSH diversity → SI).

The Role of Online DSH Activities, Identification with DSH-Related Content Creators, and DSH Diversity in the Relationship Between Family Conflicts and SI

Concerning our third objective, the frequency of online DSH activities, the level of identification with DSH-related content creators, and DSH diversity partially mediated the effects of family conflicts on SI, as a result. Thus, our results present us with an innovative path of influence, namely the indirect effect related to the frequency of online DSH activities, identification, and DSH diversity on the relationship between family conflicts and SI (i.e., family conflicts → frequency of online DSH activities → identification with DSH-related content creators → DSH diversity → SI). To further discuss these findings, we will provide a framework in relation to previous research.

Literature has shown that poor family functioning and family conflicts are positively related to adolescents' internet use and internet addiction since a negative family environment becomes a source of stress (Lin, 2020); and might not fulfill adolescents' social support needs (Mesch, 2006); or because it hinders young people capabilities to regulate negative emotions, contributing to the development of risky behaviors, including a problematic internet use (Sela et al., 2020). Focusing specifically on online DSH activities, young people who view DSH content, intentionally or accidentally, are more likely to engage in DSH or suicide due to the exposure itself or because they are more vulnerable and at an increased risk, to begin with, and thus being more likely to stumble upon problematic content (Arendt et al., 2019). Previous studies also suggest that some adolescents, lacking family support and feeling incapable of speaking with their family about their DSH, turn to the internet to find social support, a sense of belonging, peers with similar sufferings, and an opportunity to disclose their DSH (Brown et al., 2020; Gámez-Guadix et al., 2022). Thus, it is comprehensible that, in our model, higher levels of family conflicts predict a higher frequency of online DSH activities.

Prior research has stated that online DSH activities can be triggering, lead to a greater risk of a history of DSH and SI, increases in DSH frequency, severity, and SI levels, and may foster imitative behaviors, which in turn may include the discovery and practice of new DSH methods and techniques (e.g., Arendt et al., 2019; Brown et al., 2020; Frost & Casey, 2016; Lee et al., 2022; Lewis & Baker, 2011; Lewis & Seko, 2016; Memon et al., 2018; Nesi et al., 2021; Sternudd, 2012; Zhu et al., 2016). However, our findings showed that using DSH-related internet content and interacting online with peers regarding these behaviors is not enough to increase DSH diversity and SI, as we did not find significant effects between online DSH activities and the clinical variables in our model. Indeed, the results indicated that this effect only happens when young people possessing a background of family conflicts identify with the group of DSH-related content creators and view them as important (i.e., family conflicts → frequency of online DSH activities → identification with DSH-related content creators → DSH diversity → SI) (indirect effect 7).

These findings can be contextualized through Social Identity Theory (Tajfel & Turner, 1979), as it argues that the group only influences the individuals when they identify with the group (Jetten et al., 2017), i.e. when group members are recognized as significant and important. Thus, this study's results seem to be consistent with qualitative findings (Adler & Adler, 2008; Jacob et al., 2017; Sternudd, 2012) pointing that online DSH activities contribute to the development of a self-harm identity through the identification with an online community with whom adolescents share similar sufferings and symptoms, sometimes leading to more severe behaviors.

Overall, we suggest that the ability to predict SI is higher when the frequency of online activities, identification with DSH-related content creators, and, in sequence, DSH diversity, along with a background of family conflicts, are regarded. These results seem very interesting but also concerning since both DSH diversity and SI have a strong impact on suicide risk (e.g., Gouveia-Pereira et al., 2022).

Strenghts and Limitations

A major strength of this study is its innovative character regarding online DSH content representations and use. It not only describes online DSH engagement, as done in previous international studies (e.g., Nesi et al., 2021), but also brings additional understanding concerning the relationship between family conflicts and SI, highlighting a novel model where online DSH activities, identification with DSH-related content creators and DSH diversity have a role in this association. Indeed, worldwide, we found no studies on this topic. However, the current study is not free from limitations. Firstly, the cross-sectional design and the use of self-reported measures do not allow us to infer causality effects and might lead to social desirability and recall biases. The results should be treated with caution, as the Kolmogorov-Smirnov tests revealed a violation of the normality assumption. However, the absolute values of skewness and kurtosis ensured that this violation was not severe (e.g., Kline, 2005). Using a convenience sample also brings further limitations due to the homogeneity and size of the sample. Another limitation pertains to the sample's representativeness and generalizability. For instance, 42% of the participants reported at least one academic retention. Even though in Portugal schools retentions are higher than the mean for other OECD countries (European Commission, 2020), in the current study the number of participants who reported being retained academically seems to be higher compared to samples of other Portuguese studies (e.g., Gouveia-Pereira et al., 2022; Santos et al., 2023). Moreover, the prevalence of adolescents and young adults reporting a previous history of DSH, and the presented mean scores of the SIQ measure, are similar to those found in national studies analyzing both a community and a clinical sample (Duarte et al., 2020; Gouveia-Pereira et al., 2022). Future work should use longitudinal designs to address wider questions of causality and comprise a larger and randomized representative sample of the Portuguese population.

Conclusion, Implications, and Future Directions

This study highlights both the large proportion of national adolescents using DSH-related online content and interacting online regarding these behaviors with offline and online peers. Besides, it grants further support to past findings, demonstrating that family conflicts are a risk factor for SI, with DSH diversity having a role in this relationship. Furthermore, the most significant contribution of the current study is its novel path of influence that encompasses the frequency of online DSH activities and identification with DSH-related content creators in the previously mentioned model. This knowledge is relevant to developing prevention strategies and interventions that encompass the creation of online content or further supervision of online platforms and interactions, bringing implications for parents, clinicians and policymakers, who need to be aware of this phenomenon and its possible harms. It also contributes to affirming the importance of attending to family factors regarding its role in suicidality and DSH-related internet use, thus making it relevant to incorporate the family system in prevention programs and adolescent therapy, as suggested by Cruz et al. (2014) and Gouveia-Pereira et al. (2014).

Regarding future directions, it would be relevant to replicate these findings in a clinical sample, enabling a better identification of vulnerable adolescents and further contributing to the development of preventive and clinical interventions. Future studies should also focus on deepening the knowledge regarding the relationship between online DSH activities and identity construction, which could improve not only the knowledge in this field but also the clinical practice.

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Declaration of interest statement
The authors have no conflicts of interest to disclose.

Ethical statement
This manuscript is the authors' original work.
All participants engaged in the research voluntarily and anonymously.
Their data are stored in coded materials and databases without personal data.
The studies involving human participants were reviewed and approved by ISPA-Instituto Universitário Ethics Committee in Lisbon, Portugal (Registry number: I-081-5-22).

Data availability statement
Datasets presented in this article are available from the corresponding author upon reasonable request.

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References

Adams, J., Rodham, K., & Gavin, J. (2005). Investigating the "self" in deliberate self-harm. *Qualitative Health Research, 15*(10), 1293–1309. https://doi.org/10.1177/1049732305281761

Adler, P. A., & Adler, P. (2008). The cyber worlds of self-injurers: Deviant communities, relationships, and selves. *Symbolic Interaction*, *31*(1), 33–56. https://doi.org/10.1525/si.2008.31.1.33

Aggarwal, S., Patton, G., Reavley, N., Sreenivasan, S. A., & Berk, M. (2017). Youth self-harm in low- and middle-income countries: Systematic review of the risk and protective factors. *International Journal of Social Psychiatry*, *63*(4), 359–375. https://doi.org/10.1177/0020764017700175

Andover, M. S., & Gibb, B. E. (2010). Non-suicidal self-injury, attempted suicide, and suicidal intent among psychiatric inpatients. *Psychiatry Research*, *178*(1), 101–105. https://doi.org/10.1016/j.psychres.2010.03.019

Arendt, F., Scherr, S., & Romer, D. (2019). Effects of exposure to self-harm on social media: Evidence from a two-wave panel study among young adults. *New Media and Society*, *21*(11–12), 2422–2442. https://doi.org/10.1177/1461444819850106

Baker, D., & Fortune, S. (2008). Understanding self-harm and suicide websites a qualitative interview study of young adult website users. *Crisis*, *29*(3), 118–122. https://doi.org/10.1027/0227-5910.29.3.118

Baker, T. G., & Lewis, S. P. (2013). Responses to online photographs of non-suicidal self-injury: A thematic analysis. *Archives of Suicide Research*, *17*(3), 223–235. https://doi.org/10.1080/13811118.2013.805642

Bargh, J. A., Mckenna, K. Y. A., & Fitzsimons, G. M. (2002). Can you see the real me? Activation and expression of the "true self" on the internet. *Journal of Social Issues*, *58*(1), 33–48. https://doi.org/https://doi.org/10.1111/1540-4560.00247

Bell, J., Mok, K., Gardiner, E., & Pirkis, J. (2018). Suicide-related internet use among suicidal young people in the UK: Characteristics of users, effects of use, and barriers to offline help-seeking. *Archives of Suicide Research*, *22*(2), 263–277. https://doi.org/10.1080/13811118.2017.1334609

Biernesser, C., Sewall, C. J. R., Brent, D., Bear, T., Mair, C., & Trauth, J. (2020). Social media use and deliberate self-harm among youth: A systematized narrative review. *Children and Youth Services Review*, *116*. https://doi.org/10.1016/J.CHILDYOUTH.2020.105054

Blos, P. (1979). *The adolescent passage*. International Universities Press.

Branje, S. (2018). Development of parent–adolescent relationships: Conflict interactions as a mechanism of change. *Child Development Perspectives, 12*(3), 171–176. https://doi.org/10.1111/cdep.12278

Brown, R. C., Fischer, T., Goldwich, A. D., Keller, F., Young, R., & Plener, P. L. (2018). #cutting: Non-suicidal self-injury (NSSI) on Instagram. *Psychological Medicine*, *48*(2), 337–346. https://doi.org/10.1017/S0033291717001751

Brown, R. C., Fischer, T., Goldwich, D. A., & Plener, P. L. (2020). "I just finally wanted to belong somewhere"-Qualitative analysis of experiences with posting pictures of self-injury on Instagram. *Frontiers in Psychiatry*, *11*. https://doi.org/10.3389/fpsyt.2020.00274

Campaioli, G., Sale, E., Simonelli, A., & Pomini, V. (2017). The dual value of the web: Risks and benefits of the use of the internet in disorders with a self-destructive component in adolescents and young adults. *Contemporary Family Therapy*, *39*(4), 301–313. https://doi.org/10.1007/s10591-017-9443-9

Cruz, D., Narciso, I., Pereira, C. R., & Sampaio, D. (2014). Risk trajectories of self-destructiveness in adolescence: Family core influences. *Journal of Child and Family Studies*, *23*(7), 1172–1181. https://doi.org/10.1007/s10826-013-9777-3

Dieserud, G., Gerhardsen, R. M., Van den Weghe, H., & Corbett, K. (2010). Adolescent suicide attempts in Bærum, Norway, 1984–2006: Trends, triggers, and underlying reasons. *Crisis*, *31*(5), 255–264. https://doi.org/10.1027/0227-5910/a000030

Duarte, E., Gouveia-Pereira, M., & Gomes, H. S. (2019). Development and factorial validation of the inventory of deliberate self-harm behaviours for Portuguese adolescents. *Psychiatric Quarterly*, *90*(4), 761–776. https://doi.org/10.1007/s11126-019-09660-1

Duarte, T. A., Paulino, S., Almeida, C., Gomes, H. S., Santos, N., & Gouveia-Pereira, M. (2020). Self-harm as a predisposition for suicide attempts: A study of adolescents' deliberate self-harm, suicidal ideation, and suicide attempts. *Psychiatry Research*, *287*. https://doi.org/10.1016/j.psychres.2019.112553

Duggan, J. M., Heath, N. L., Lewis, S. P., & Baxter, A. L. (2012). An examination of the scope and nature of non-suicidal self-injury online activities: Implications for school mental health professionals. *School Mental Health*, *4*(1), 56–67. https://doi.org/10.1007/s12310-011-9065-6

Dyson, M. P., Hartling, L., Shulhan, J., Chisholm, A., Milne, A., Sundar, P., Scott, S. D., & Newton, A. S. (2016). A systematic review of social media use to discuss and view deliberate self-harm acts. *PLoS ONE*, *11*(5), Article e0155813. https://doi.org/10.1371/journal.pone.0155813

European Commission. (2020). *Equity in school education in Europe. Structures, policies and student performance*. Eurydice report. Publications Office of the European Union. https://doi.org/10.2797/286306

Ferreira, J. A., & Castela, M. C. (1999). Questionário de ideação suicida (Q.I.S) [Questionnaire of suicidal ideation]. In L. Simões, M. Gonçalves, & L. Almeida (Eds.), *Testes e provas psicológicas em Portugal* (pp. 123–130). Apport/Sho.

Frost, M., & Casey, L. (2016). Who seeks help online for self-injury? *Archives of Suicide Research*, *20*(1), 69–79. https://doi.org/10.1080/13811118.2015.1004470

Frost, M., Casey, L., & Rando, N. (2016). Self-injury, help-seeking, and the internet: Informing online service provision for young people. *Crisis*, *37*(1), 68–76. https://doi.org/10.1027/0227-5910/a000346

Gámez-Guadix, M., Mateos, E., Wachs, S., & Blanco, M. (2022). Self-Harm on the internet among adolescents: Prevalence and association with depression, anxiety, family cohesion, and social resources. *Psicothema*, *34*(2), 233–239. https://doi.org/10.7334/psicothema2021.328

Gaspar, T., Guedes, F. B., Cerqueira, A., Matos, M. G., & Equipa Aventura Social. (2022). *A saúde dos adolescentes portugueses em contexto de pandemia - Dados nacionais do estudo HBSC 2022 [The health of Portuguese adolescents in the context of the pandemic – National data from the HBSC 2022 study]*. [Ebook]. https://aventurasocial.com/wp-content/uploads/2022/12/HBSC_Relato%CC%81rioNacional_2022-1.pdf

Giordano, A. L., Lundeen, L. A., Wester, K. L., Lee, J., Vickers, S., Schmit, M. K., & Kim, I. K. (2022). Nonsuicidal self-Injury on Instagram: Examining hashtag trends. *International Journal for the Advancement of Counselling*, *44*(1). https://doi.org/10.1007/s10447-021-09451-z

Gouveia-Pereira, M., Abreu, S., & Martins, C. (2014). How do families of adolescents with suicidal ideation behave? *Psicologia: Reflexão e Crítica*, *27*(1), 171–178. https://doi.org/https://doi.org/10.1590/S0102-79722014000100019

Gouveia-Pereira, M., Duarte, E., Gomes, H. S., da Silva, C. T., & Santos, N. (2022). Exploring the suicidal continuum: Deliberate self-harm diversity and severity as predictors of suicidal ideation and suicide attempts. *Psychiatry Research*, *309*. https://doi.org/10.1016/j.psychres.2022.114400

Grandclerc, S., De Labrouhe, D., Spodenkiewicz, M., Lachal, J., & Moro, M. R. (2016). Relations between nonsuicidal self-injury and suicidal behavior in adolescence: A systematic review. *PLoS ONE*, *11*(4), Article e0153760. https://doi.org/10.1371/journal.pone.0153760

Guan, K., Fox, K. R., & Prinstein, M. J. (2012). Nonsuicidal self-injury as a time-invariant predictor of adolescent suicide ideation and attempts in a diverse community sample. *Journal of Consulting and Clinical Psychology*, *80*(5), 842–849. https://doi.org/10.1037/a0029429

Guerreiro, D. F., Sampaio, D., Figueira, M. L., & Madge, N. (2017). Self-harm in adolescents: A self-report survey in schools from Lisbon, Portugal. *Archives of Suicide Research*, *21*(1), 83–99. https://doi.org/10.1080/13811118.2015.1004480

Gulbas, L. E., Hausmann-Stabile, C., De Luca, S. M., Tyler, T. R., & Zayas, L. H. (2015). An exploratory study of nonsuicidal self-injury and suicidal behaviors in adolescent Latinas. *American Journal of Orthopsychiatry*, *85*(4), 302–314. https://doi.org/10.1037/ort0000073

Hamza, C. A., Stewart, S. L., & Willoughby, T. (2012). Examining the link between nonsuicidal self-injury and suicidal behavior: A review of the literature and an integrated model. *Clinical Psychology Review*, *32*(6), 482–495. https://doi.org/10.1016/j.cpr.2012.05.003

Hawton, K., Saunders, K. E. A., & O'Connor, R. C. (2012). Self-harm and suicide in adolescents. *The Lancet*, *379*(9834), 2373–2382. https://doi.org/10.1016/S0140-6736(12)60322-5

Hayes, A. F. (2022). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (3rd ed.). The Guilford Press.

Jacob, N., Evans, R., & Scourfield, J. (2017). The influence of online images on self-harm: A qualitative study of young people aged 16–24. *Journal of Adolescence*, *60*(1), 140–147. https://doi.org/10.1016/j.adolescence.2017.08.001

Jetten, J., Haslam, S. A., Cruwys, T., Greenaway, K. H., Haslam, C., & Steffens, N. K. (2017). Advancing the social identity approach to health and well-being: Progressing the social cure research agenda. *European Journal of Social Psychology*, *47*(7), 789–802. https://doi.org/10.1002/ejsp.2333

Kalpakci, A., Venta, A., & Sharp, C. (2014). Beliefs about unmet interpersonal needs mediate the relation between conflictual family relations and borderline personality features in young adult females. *Borderline Personality Disorder and Emotion Dysregulation, 1*, Article 11. https://doi.org/10.1186/2051-6673-1-11

Kim H. Y. (2013). Statistical notes for clinical researchers: Assessing normal distribution (2) using skewness and kurtosis. *Restorative Dentistry & Endodontics*, *38*(1), 52–54. https://doi.org/10.5395/rde.2013.38.1.52

Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). Guilford Press.

Lavis, A., & Winter, R. (2020). #Online harms or benefits? An ethnographic analysis of the positives and negatives of peer-support around self-harm on social media. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *61*(8), 842–854. https://doi.org/10.1111/jcpp.13245

Lee, S. E., Yim, M., & Hur, J. W. (2022). Beneath the surface: Clinical and psychosocial correlates of posting nonsuicidal self-injury content online among female young adults. *Computers in Human Behavior*, *132*. https://doi.org/10.1016/j.chb.2022.107262

Lewis, S. P., & Baker, T. G. (2011). The possible risks of self-injury web sites: A content analysis. *Archives of Suicide Research*, *15*(4), 390–396. https://doi.org/10.1080/13811118.2011.616154

Lewis, S. P., Heath, N. L., Michal, N. J., & Duggan, J. M. (2012). Non-suicidal self-injury, youth, and the internet: What mental health professionals need to know. *Child and Adolescent Psychiatry and Mental Health*, *6*(1), 13–21. https://doi.org/10.1186/1753-2000-6-13

Lewis, S. P., & Seko, Y. (2016). A double-edged sword: A review of benefits and risks of online nonsuicidal self-injury activities. *Journal of Clinical Psychology*, *72*(3), 249–262. https://doi.org/10.1002/jclp.22242

Lin, M. P. (2020). Prevalence of internet addiction during the COVID-19 outbreak and its risk factors among junior high school students in Taiwan. *International Journal of Environmental Research and Public Health*, *17*(22), Article 8547. https://doi.org/10.3390/ijerph17228547

Logrieco, G., Marchili, M. R., Roversi, M., & Villani, A. (2021). The paradox of Tik Tok anti-pro-anorexia videos: How social media can promote non-suicidal self-injury and anorexia. *International Journal of Environmental Research and Public Health*, *18*(3), Article 1041. https://doi.org/10.3390/ijerph18031041

Madge, N., Hewitt, A., Hawton, K., Wilde, E., Corcoran, P., Fekete, S., van Heeringen, K., De Leo, D., & Ystgaard, M. (2008). Deliberate self-harm within an international community sample of young people: Comparative findings from the Child & Adolescent Self-harm in Europe (CASE) Study. *Journal of Child Psychology and Psychiatry*, *49*(6), 667–677. https://doi.org/10.1111/j.1469-7610.2008.01879.x

Marchant, A., Hawton, K., Stewart, A., Montgomery, P., Singaravelu, V., Lloyd, K., Purdy, N., Daine, K., & John, A. (2017). A systematic review of the relationship between internet use, self-harm and suicidal behaviour in young people: The good, the bad and the unknown. *PLoS ONE*, *12*(8), Article e0181722. https://doi.org/10.1371/journal.pone.0181722

Margherita, G., & Gargiulo, A. (2018). A comparison between pro-anorexia and non-suicidal self-injury blogs: From symptom-based identity to sharing of emotions. *Psychodynamic Practice*, *24*(4), 346–363. https://doi.org/10.1080/14753634.2018.1535326

Mesch, G. S. (2006). Family relations and the internet: Exploring a family boundaries approach. *Journal of Family Communication*, *6*(2), 119–138. https://doi.org/10.1207/s15327698jfc0602_2

Naz, A., Naureen, A., Kiran, T., Husain, O., Minhas, A., Razzaque, B., Tofique, S., Husain, N., Furber, C., & Chaudhry, N. (2021). Exploring lived experiences of adolescents presenting with self-harm and their views about suicide prevention strategies: A qualitative approach. *International Journal of Environmental Research and Public Health*, *18*(9), Article 4694. https://doi.org/10.3390/ijerph18094694

Nesi, J., Burke, T. A., Lawrence, H. R., MacPherson, H. A., Spirito, A., & Wolff, J. C. (2021). Online self-injury activities among psychiatrically hospitalized adolescents: Prevalence, functions, and perceived consequences. *Research on Child and Adolescent Psychopathology*, *49*(4), 519–531. https://doi.org/10.1007/s10802-020-00734-4

Nicolopoulos, A., Boydell, K., Shand, F., & Christensen, H. (2018). Why suicide? Reasons for suicide attempts as self-reported by youth: A systematic evaluation of qualitative studies. *Adolescent Research Review*, *3*(2), 155–172. https://doi.org/10.1007/s40894-017-0070-3

Nobre-Lima, L., Barreira, A., & Castilho, P. (2017). A influência de fatores sociodemográficos na expressão de comportamentos autolesivos não suicidários (NSSI) em adolescentes portugueses [The influence of sociodemographic factors in the expression of non-suicidal self-injury behaviors (NSSI) of Portuguese adolescents]. *Journal of Child and Adolescent Psychology*, *8*, 33–48.

O'Brien, K. H. M., Nicolopoulos, A., Almeida, J., Aguinaldo, L. D., & Rosen, R. K. (2021). Why adolescents attempt suicide: A qualitative study of the transition from ideation to action. *Archives of Suicide Research*, *25*(2), 269–286. https://doi.org/10.1080/13811118.2019.1675561

Palmonari, A., Kirchler, E., & Pombeni, M. L. (1991). Differential effects of identification with family and peers on coping with developmental tasks in adolescence. *European Journal of Social Psychology*, *21*(5), 381–402. https://doi.org/10.1002/ejsp.2420210503

Pelkonen, M., & Marttunen, M. (2003). Child and adolescent suicide: Epidemiology, risk factors, and approaches to prevention. *Paediatric Drugs*, *5*(4), 243–265. https://doi.org/10.2165/00128072-200305040-00004

Reynolds, W. M. (1988). *Suicide ideation questionnaire (SIQ).* Psychological Assessment Resources.

Rodham, K., Gavin, J., & Miles, M. (2007). I Hear, I listen and I care: A qualitative investigation into the function of a self-harm message board. *Suicide and Life-Threatening Behavior*, *37*(4), 422–430. https://doi.org/10.1521/suli.2007.37.4.422

Santos, N. N., Monteiro, V., & Carvalho, C. (2023). Impact of grade retention and school engagement on student intentions to enrol in higher education in Portugal. *European Journal of Education*, *58*(1), 130–150. https://doi.org/10.1111/ejed.12535

Sands, R. G., & Dixon, S. L. (1986). Adolescent crisis and suicidal behavior: Dynamics and treatment. *Child & Adolescent Social Work Journal, 3*(2), 109–122. https://doi.org/10.1007/BF00757218

Seko, Y., Kidd, S. A., Wiljer, D., & McKenzie, K. J. (2015). On the creative edge: Exploring motivations for creating non-suicidal self-injury content online. *Qualitative Health Research*, *25*(10), 1334–1346. https://doi.org/10.1177/1049732315570134

Sela, Y., Zach, M., Amichay-Hamburger, Y., Mishali, M., & Omer, H. (2020). Family environment and problematic internet use among adolescents: The mediating roles of depression and Fear of Missing Out. *Computers in Human Behavior*, *106*, Article 106226. https://doi.org/10.1016/j.chb.2019.106226

Seong, E., Noh, G., Lee, K. H., Lee, J. S., Kim, S., Seo, D. G., Yoo, J. H., Hwang, H., Choi, C. H., Han, D. H., Hong, S. B., & Kim, J. W. (2021). Relationship of social and behavioral characteristics to suicidality in community adolescents with self-harm: Considering contagion and connection on social media. *Frontiers in Psychology*, *12*, Article 691438. https://doi.org/10.3389/fpsyg.2021.691438

Simes, D., Shochet, I., Murray, K., & Sands, I. G. (2022). A systematic review of qualitative research of the experiences of young people and their caregivers affected by suicidality and self-harm: Implications for family-based treatment. *Adolescent Research Review*, *7*(2), 211–233. https://doi.org/10.1007/s40894-021-00164-3

Simone, A. C., & Hamza, C. A. (2020). Examining the disclosure of nonsuicidal self-injury to informal and formal sources: A review of the literature. *Clinical Psychology Review*, *82*, Article 101907. https://doi.org/10.1016/j.cpr.2020.101907

Steinberg, L. (2001). We know some things: Adolescent–parent relationships in retrospect and prospect. *Journal of Research on Adolescence*, *11*(1), 1–19. https://doi.org/10.1111/1532-7795.00001

Sternudd, H. T. (2012). Photographs of self-injury: Production and reception in a group of self-injurers. *Journal of Youth Studies*, *15*(4), 421–436. https://doi.org/10.1080/13676261.2012.663894

Suyemoto K. L. (1998). The functions of self-mutilation. *Clinical Psychology Review, 18*(5), 531–554. https://doi.org/10.1016/s0272-7358(97)00105-0

Syed, E. U., & Khan, M. M. (2008). Pattern of deliberate self-harm in young people in Karachi, Pakistan. *Crisis*, *29*(3), 159–163. https://doi.org/10.1027/0227-5910.29.3.159

Tajfel, H., & Turner, J. (1979). An integrative theory of intergroup conflict. In W. G. Austim & S. Worchel (Eds.), *Psychology of Intergroup Relations* (pp. 33–47). Annual Reviews Inc.

Teodoro, M. L. M., Allgayer, M., & Land, B. (2009). Desenvolvimento e validade fatorial do Inventário do Clima Familiar (ICF) para adolescentes [Development and factorial validity of Family Climate Inventory (FCI) for adolescents]. *Psicologia: Teoria e Prática*, *11*(3), 27–39.

Weymouth, B. B., Buehler, C., Zhou, N., & Henson, R. A. (2016). A meta-analysis of parent–adolescent conflict: Disagreement, hostility, and youth maladjustment. *Journal of Family Theory & Review, 8*(1), 95–112. https://doi.org/10.1111/jftr.12126

Whitlock, J. L., Powers, J. L., & Eckenrode, J. (2006). The virtual cutting edge: The internet and adolescent self-injury. *Developmental Psychology*, *42*(3), 407–417. https://doi.org/10.1037/0012-1649.42.3.407

Wright, M. F., Wachs, S., & Gámez-Guadix, M. (2021). Jóvenes ante el ciberodio: El rol de la mediación parental y el apoyo familiar [Youths' coping with cyberhate: Roles of parental mediation and family support]. *Comunicar*, *29*(67). https://doi.org/10.3916/C67-2021-02

Zetterqvist, M., Jonsson, L. S., Landberg, Å., & Svedin, C. G. (2021). A potential increase in adolescent nonsuicidal self-injury during COVID-19: A comparison of data from three different time points during 2011 – 2021. *Psychiatry Research*, *305,* Article 114208. https://doi.org/10.1016/j.psychres.2021.114208

Zhu, L., Westers, N. J., Horton, S. E., King, J. D., Diederich, A., Stewart, S. M., & Kennard, B. D. (2016). Frequency of exposure to and engagement in nonsuicidal self-injury among inpatient adolescents. *Archives of Suicide Research*, *20*(4), 580–590. https://doi.org/10.1080/13811118.2016.1162240

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RESEARCH ARTICLE

The Effect of Adverse and Positive Childhood Experiences, Attachment, and Emotional Support on Adult Mental Health

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Introduction: Adverse childhood experiences (ACEs) can contribute to significant health issues in adulthood.
Aims: The present study seeks to understand the role of attachment and positive childhood experiences (PCEs) in the association between ACEs, self-rated emotional support and mental health.
Methods: An online panel survey gathered data from 4,940 Slovenian adults aged 18 to 75. Simultaneous multiple regression path analysis (PROCESS) was used to test two moderation and mediation models.
Results: Results indicate that ACEs were weakly associated with higher rates of anxious attachment and reduced self-rated mental health. Anxious attachment mediated the relation between ACEs and self-rated emotional support and self-rated mental health. PCEs were weakly negatively associated with anxious and avoidant attachment and interacted with ACEs in their effect on emotional support in adulthood. The strongest associations were found in the negative pathways between the two attachment styles (anxious and avoidant), emotional support, and self-rated mental health.
Conclusions: These findings can guide (therapeutic) interventions for individuals with a history of child adversity: interventions could focus on addressing insecure attachment, involve a person's social network as well as recognize and support the potential role of positive childhood experiences as protective factors.

Keywords: attachment anxiety, attachment avoidance, adverse and positive childhood experiences, self-rated mental health, self-rated emotional support

Introduction

Adverse Childhood Experiences (ACEs) are recognized as a major global health problem as they can have long-lasting negative effects on physical and mental health, psychosocial functioning, and quality of life (Felitti et al., 1998; Hughes et al., 2017; van der Kolk et al., 2005). Indeed, the severity of ACEs is recognized globally, highlighted by their inclusion in the United Nations Sustainable Development Goals (United Nations, 2015). Several constructs have been used to better understand the associations between these adverse experiences in early life and adult outcomes. One of the most well-known such constructs is attachment (e.g., Corcoran & McNulty, 2018; Muller et al., 2012; Widom et al., 2018).

The attachment theory proposed by John Bowlby (1982) states that childhood mental representations and attachment patterns formed during early interactions with attachment figures influence adult attachment. This

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theory distinguishes between secure attachment, which results from consistent, sensitive interactions with caregivers, and insecure attachment, which can be further subdivided into resistant and avoidant styles (Ainsworth et al., 1978; Cassidy & Berlin, 1994). Securely attached children have the confidence that their carers are there to meet their needs. These children seek comfort from their caregivers when they are frightened, show distress when their caregivers leave, and are happy when they return. This attachment style develops through consistent, sensitive and attentive care. Children with resistant attachment show clinginess and dependence, but also difficulties in being comforted. They can be very distressed when their attachment figure leaves and ambivalent when they return because they seek comfort but resist it. This pattern results from the caregiver's inconsistent availability and responsiveness, which makes the child insecure about the caregiver's reliability (Ainsworth et al., 1978). Children with an avoidant attachment show hardly any emotional reactions to the presence or absence of their attachment figure and may even avoid them altogether. They tend to be self-reliant and emotionally distant, often because the carer is unavailable or unresponsive to their needs. These children learn to suppress their emotional needs to avoid rejection or neglect (Cassidy & Berlin, 1994).

Adverse childhood circumstances, such as maltreatment or parental psychopathology, may precipitate the development of "disorganized" attachment in childhood (Baer & Martinez, 2006; Main & Solomon, 1990), which is referred to as "unresolved" attachment in adulthood (Main & Hesse, 1990). Disorganized attachment occurs when a child's need for closeness and security with their caregiver collides with their fear of the same person, resulting in a lack of coherent attachment strategy (Main & Solomon, 1990). This pattern of attachment is considered particularly maladaptive because it fails to provide a sense of security or a reliable strategy for dealing with stress and emotions. It is often associated with atypical maternal behavior as described in the AMBIANCE code system, which identifies disrupted communication and caregiving patterns between the caregiver and the child (Lyons-Ruth et al., 2013). When disorganized patterns persist into adulthood without informal or formal support and attachment-related interventions, they pose risks for the development of psychopathology (Cicchetti & Doyle, 2016; Mikulincer & Shaver, 2012).

Our research builds on the understanding that attachment, which is expressed not only at the psychological and interpersonal level but also at the neurobiological level, is a critical mechanism due to its potential for modification, making it an appropriate target for interventions developed for people with adverse life histories (Lahousen et al., 2019; Schore & Schore, 2008). Attachment patterns are not static; they can change over time in response to life events and relational experiences, which emphasizes the importance of timely and effective interventions.

It is important to recognize the continuum of parenting behaviors, ranging from insensitive interactions to more severe trauma such as abuse or neglect, as well as the continuum of attachment types, ranging from insecure to disorganized to attachment disorders including Reactive Attachment Disorder and Disinhibited Social Engagement Disorder which represent the most severe disruptions in attachment patterns (American Psychiatric Association, 2013).

Our research focuses specifically on attachment insecurity and its indicators, which are assessed using brief screening tools for risks of avoidant and anxious tendencies. In our study, we use the terms "attachment anxiety" and "attachment avoidance" as used by several authors (e.g., Corcoran & McNulty, 2018; Mikulincer & Shaver, 2005). Attachment anxiety is characterized by an excessive need for closeness and fear of rejection. Attachment avoidance corresponds to avoidant attachment, which is characterized by emotional distance and self-reliance. By identifying and measuring the signs of attachment insecurity, we aim to better understand the complex interactions between adverse childhood experiences and mental health in adulthood. This approach will allow us to develop targeted interventions that can change attachment patterns and thus improve the psychological and interpersonal functioning of people with adverse life histories.

Empirical Results and Research Gaps

ACEs, Attachment and Mental Health

There is extensive research on the detrimental effects of ACEs on adult outcomes, including self-rated health (Felitti et al., 1998; Hughes et al., 2017; Petruccelli et al., 2019). ACEs have a significant impact on mental health in adulthood and contribute to a higher risk of developing depression, anxiety, PTSD and other mental disorders (Anda et al., 2006; Edwards et al., 2003; Hughes et al., 2017). Furthermore, the literature points to the mediating role of attachment in developing adverse childhood experiences into psychopathology in adulthood, which includes mental health symptoms, personality disorders, somatic symptoms and risk behaviors (Bifulco et al., 2006; Corcoran & McNulty, 2018; Hankin, 2005; Lin et al., 2020; Oshri et al., 2015; Riggs et al., 2007; Schimmenti

& Bifulco, 2015; Widom et al., 2018). Some studies, such as Corcoran and McNulty (2018), demonstrate that attachment anxiety and avoidance mediate the relationship between adverse childhood circumstances and subjective well-being. Their research shows that people with a high level of attachment anxiety or avoidance who experienced adverse circumstances in their childhood have a lower subjective well-being. However, other studies question the universality of these pathways, pointing only at the mediating role of attachment anxiety but not avoidance (Lin et al., 2020; Schimmenti & Bifulco, 2015), or finding different pathways depending on the attachment measurement method used (self-report questionnaire or interview) (Riggs et al., 2007).

Although attachment insecurity generally correlates with various forms of psychological distress, the pathways are complex and are influenced by individual differences in coping mechanisms and social support systems, indicating that attachment anxiety and avoidance are not deterministic but interact with a range of personal and environmental factors and are part of a broader interplay of circumstances that influence adult outcomes. Further research is needed to explore how different attachment styles influence the long-term outcomes of adverse childhood experiences and to identify the moderating factors that can enhance mental health.

In this study, we focus on self-rated mental health as the primary outcome variable, rather than on specific psychopathologies. While mental health is often equated with the absence of mental symptoms or disorders, the World Health Organization (2022) defines it more broadly to include subjective well-being, coping and contribution to the community. Therefore, we use self-rated mental health to provide a holistic view that encompasses feelings of well-being or distress and their impact on functioning (Ahmad et al., 2014; Levinson & Kaplan, 2014; McAlpine et al., 2018). The use of self-rated mental health is relevant because the results show that correlations between diagnostic measures of mental health and subjectively rated mental health are modest (McAlpine et al., 2018). Both measures capture different aspects of mental health, allowing for the possibility that someone could meet the criteria for mental illness while maintaining healthy aspects of mental health. Self-rated mental health provides additional predictive value for various outcomes (e.g., mortality and future well-being), beyond objective measures of mental health, and includes characteristics not captured by objective diagnostic measures such as severity, recency, persistence of symptoms and impairment of functioning (Levinson & Kaplan, 2014; McAlpine et al., 2018).

ACEs, Attachment, and Emotional Support

Emotional support is often a precursor to sound mental health; it involves providing comfort and help to others who are struggling with problems or worries (Cutrona, 1990; Cutrona & Russel, 1983). Actual received and perceived emotional support are not necessarily the same. The latter depends on how a person appraises potential support and has been linked to myriad health outcomes (Haber et al., 2007). People differ in their need for support as a means of coping with distress, in their ability to mobilize the support available in their social environment, in their ability to use the support offered, and in their satisfaction with the support (Coble et al., 1996; Sarason et al., 1991). Attachment theory provides a useful theoretical framework for understanding these differences, particularly in the context of ACEs. ACEs, such as childhood abuse, neglect, or household dysfunction, can significantly disrupt the development of secure attachment and have long-term effects on how people perceive and utilize emotional support in adulthood. Securely attached individuals possessing a history of relationships with significant others who have been available and responsive to signals of distress in times of need, create an expectation that significant others will be available when needed and able to bring comfort and relief (Ainsworth et al., 1978; Hazan & Shaver, 1987). This expectation, developed despite the possible presence of ACEs, allows them to effectively recognize and utilize available support, which is crucial for regulating distress and maintaining mental health.

In contrast, individuals who experienced ACEs often develop insecure attachment styles due to past relationships with attachment figures who were unresponsive, unavailable or rejecting in times of need. These individuals, whether they develop an avoidant or anxious-preoccupied attachment style, may struggle with the perception and utilization of emotional support in adulthood. They often develop a general belief that significant others cannot comfort them when they are distressed and are ambivalent or unwilling to rely on others to help them cope with life's adversities (Ainsworth et al., 1978; Hazan & Shaver, 1987). Existing studies show that individuals with insecure attachment, particularly those shaped by ACEs, tend to report low levels of perceived support, even if the support is available to them (Anders & Tucker, 2000; Blain et al., 1993; Florian et al., 1995; Kobak & Sceery, 1988; Priel & Shamai, 1995; Wallace & Vaux, 1993).

Perceptions of lower support may be related to emotion regulation strategies that are influenced by attachment qualities, especially by the attachment disruptions caused by ACEs (Brenning & Braet, 2013; Ognibene &

Collins, 1998), including biases regarding the availability and trustworthiness of others (Sirois et al., 2016) and behavioral components such as deficits in interpersonal communication skills (Anders & Tucker, 2000). People with anxious attachment may use hyperactivation strategies as an attempt to cope with distress and regulate emotions, which can lead to excessive and sometimes insatiable demands for support, reinforcing the perception that others are less available and sensitive to their needs (Mikulincer et al., 1993). They may also doubt that others can comfort them or fear the possibility of being rejected. As a result, they may distrust the intentions of others, interpret their responses negatively, and believe that they do not have the appropriate skills to mobilize available sources of support (e.g., Collins & Read, 1990; Hazan & Shaver, 1987; Mikulincer & Florian, 1997). Conversely, individuals with avoidant attachment typically deactivate their attachment system in distressing situations, use emotional disengagement as a coping strategy, maintain emotional distance from others, and rely predominantly on their own resources (Hazan & Shaver, 1987; Mikulincer & Shaver, 2007). Their façade of independence and "compulsive self-reliance" (Bowlby, 1980) may mask their distrust of others as sources of support and lead them to devalue any support offered as not available or necessary (Mikulincer & Shaver, 2007). However, there is a still a need for further research regarding ACEs influence on perceived emotional support (Bethell et al., 2019).

Moderating Role of Positive Childhood Experiences (PCEs)

In addition to the well-documented harmful effects of ACEs, research has shown that positive childhood experiences (PCEs) can play an important role in counteracting these negative effects. PCEs, characterized by safe, stable and nurturing relationships as well as supportive community and environmental factors, carry the potential to mitigate the negative impact of ACEs on negative mental health outcomes in adulthood and increase resilience (Afifi & MacMillan, 2011; Bethell et al., 2019; Crandall et al., 2019; Kuhar & Zager Kocjan, 2021; Masten & Cicchetti, 2016). Research has primarily focused on PCEs in the area of relationships, emphasizing the importance of secure, stable and nurturing relationships (Thornberry et al., 2013). Studies have shown that having at least one positive relationship with an adult in childhood can mitigate the negative effects of childhood adversity on later life outcomes (Bellis et al., 2017; Crouch et al., 2019). Furthermore, an individual's experiences and adaptive responses to adversity are shaped by a complex interplay of factors including personal characteristics, community and societal resources (e.g., safe and supportive neighborhoods, schools, clubs) (Biggs et al., 2017), as well as natural and spiritual experiences (Bethell et al., 2019).

Research Objectives

The present study aims to:

- Explore the mediating role of attachment insecurity, specifically anxiety and avoidance, in the relationship between ACEs and self-rated emotional support and mental health: Despite an extensive research on the effects of ACEs on mental health, a notable gap exists in understanding how attachment insecurity, particularly anxiety and avoidance, mediates the relationship between ACEs and self-rated emotional support and mental health. To address this gap, the present study aims to examine the mediating effects of these attachment styles, providing insights into the pathways through which ACEs influence adult psychological outcomes. By exploring these mediating roles, we hope to improve the understanding regarding the underlying mechanisms.
- Examine both direct and indirect relationships between ACEs and self-rated emotional support through attachment styles: This study aims to investigate how attachment styles mediate the relationship between ACEs and self-rated emotional support, and how emotional support, influenced by attachment styles, may serve as both an outcome of ACEs and a moderator of their effects on self-rated mental health. Self-rated emotional support, influenced by attachment styles, may be both an outcome of ACEs and a moderator of their effects on mental health. Although previous research has focused on the protective or buffering effects of perceived versus received support in adulthood against the negative consequences of ACEs (e.g., Cheong et al., 2017; Runtz & Schallow, 1997; Sperry & Widom, 2013), understanding how insecure attachment might elucidate the connection between ACEs and perceived emotional support in adulthood remains incomplete. Despite the extensive research on the impact of ACEs on mental health conditions (Hughes et al., 2017), a notable gap exists in the literature regarding how ACEs influence perceived emotional support (Bethell et al., 2019). The present study seeks to fill these gaps by means of providing a comprehensive analysis of these relationships.

- Examine the moderating role of PCEs in the impact of ACEs on self-rated emotional support and mental health: While we know that PCEs can buffer the negative effects of ACEs on mental health, the specific mechanisms through which they operate, particularly their role in mitigating the effects of ACEs on perceived emotional support and mental health, have not yet been adequately explored. The present study aims to fill this gap through investigating how PCEs influence the relationship between ACEs and self-rated emotional support and mental health. Understanding these mechanisms is crucial for the development of developing interventions that utilize PCEs to strengthen resilience and improve mental health in people with ACEs.

By systematically exploring the role of attachment insecurity and PCEs in the context of ACEs, this study aims to provide insights that can further inform the development of therapeutic and preventive strategies to mitigate the harmful effects of ACEs.

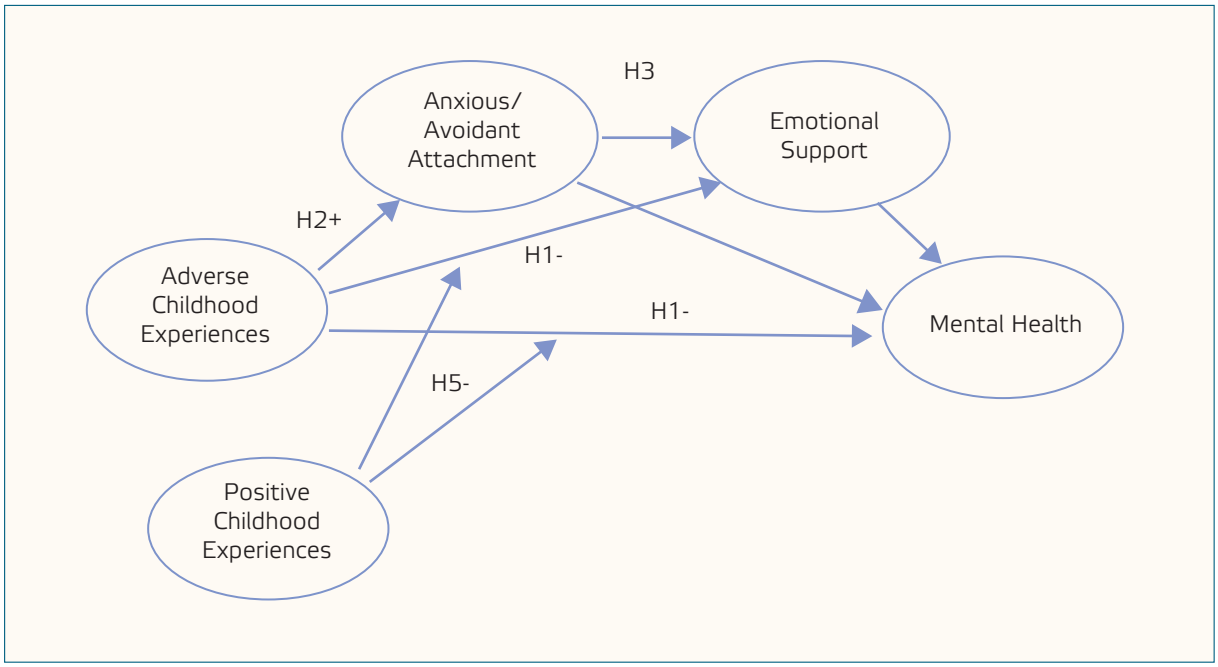
Our proposed model is based on a serial mediation approach that examines perceived emotional support as an antecedent of self-rated mental health. This perspective derives from evidence suggesting that self-rated emotional support and self-rated mental health can predict outcomes such as physical well-being, health use and expenditure (Cohen & Wills, 1985; McAlpine et al., 2018; Nguyen et al., 2015).

Hypotheses

Based on the theoretical overview, we postulate the following hypotheses (presented in Figure 1):

- Hypothesis I: Higher numbers of ACEs are negatively associated with self-rated (a) emotional support and (b) mental health.
- Hypothesis II: Higher numbers of ACEs are positively associated with (a) avoidant and (b) anxious attachment.
- Hypothesis III: The association between ACEs and self-rated mental health is mediated by (a) attachment avoidance and anxiety and (b) self-rated emotional support.
- Hypothesis IV: PCEs are negatively associated with (a) avoidant and (b) anxious attachment.
- Hypothesis V: PCEs moderate (reduce) the direct negative association between ACEs and self-rated (a) emotional support and (b) mental health.

Figure 1. Conceptual Moderation and Mediation Model Portraying the Hypothesized Associations Between ACEs, PCEs, Attachment Qualities, Self-Rated Emotional Support, and Mental Health



Note. H4 predicts direct associations between PCEs and attachment and is not depicted in Figure 1. H3 predicts the indirect association from ACEs to self-rated mental health through attachment and perceived emotional support. Anxious and avoidant attachment models were run separately.

Method

Participants and Data Collection

We tested the model on a large sample of Slovenian adults with demographic characteristics similar to those of the general Slovene population. Although a former Yugoslav republic, Slovenia was the "westernmost" country of the Eastern European communist bloc, gaining independence in 1991 and joining the EU in 2004. In terms of demographic, family, and child-rearing trends, Slovenia is considered more modern than Eastern and Southern Europe and quite like Western countries (e.g., Švab et al., 2012). Therefore, we assumed that the used constructs apply to the Slovenian population in a similar way as to other Western populations.

Participants were recruited from an online survey panel run by a Slovene research agency using nonprobability quota sampling based on the demographic characteristics regarding the population of Slovenia aged between 18 and 75 years. The panel consists of individuals who have given their informed consent in advance to participating in online surveys and receive a small compensation for their participation. We conducted a computerized web survey that was fully completed by 4,940 panelists. Data collection took place between February and October 2019. Data were weighted by gender, age, education, and statistical regions to reduce potential bias and ensure an accurate reflection of the population. The weighting was done through an iterative proportional adjustment process that matches survey respondents to population benchmarks. Demographic benchmarks were obtained from the SiStat data portal (Statistical Office of the Republic of Slovenia (SURS), 2018). The characteristics of the survey sample are presented in the online appendix. In the weighted study sample, women accounted for 49.1% and men for 50.9% of the participants. The average participant age was 46.7 years (SD = 15.3 years). In terms of their education, 43.9% of the participants completed only primary school, 31.0% completed secondary school and 25.0% completed a post-secondary or tertiary education. Participants also provided a self-assessment of their household's material living conditions, with 40.3% reporting below average material living conditions, 45.1% reporting average material living conditions, and 14.7% reporting above average material living conditions. The study was approved by the National Medical Ethics Committee of the Ministry of Health (0120–236/2019/4).

Measures

Adverse Childhood Experiences

Adverse childhood experiences (ACEs) were measured with ten items asking about a variety of negative experiences based on Felitti et al. (1998), Dube et al. (2003), and the Behavior Risk Factor Surveillance System (Centers for Disease Control and Prevention, n.d.) – for the full items see Kuhar & Zager Kocjan, 2021). Five items measured child maltreatment (i.e., physical abuse, emotional abuse, sexual abuse, physical neglect, and emotional neglect), and five items measured household dysfunction among the adults in the household (i.e., domestic violence, mental illness, substance abuse, incarceration, death/separation of parents). The items on child maltreatment were on a scale from *never* (1) to *very often* (5). Household dysfunction items were dichotomous (*yes/no*). If a participant indicated that at least one of the items for a single ACE was present (answering *yes* to the items on household dysfunction) or that he or she had experienced the adverse situation at least a few times (answering *sometimes*, *often*, or *very often* to physical and emotional abuse and neglect items) by the age of 18, a score of 1 was given for that ACE. In the case of sexual abuse, 1 was also given for the answer *once* for any of the corresponding items. Once the scores were assigned, all items were summed to create an ACE composite variable that ranged from 0–10. In this study, the 10-item scale was reliable (α = .75).

Positive Childhood Experiences

Positive childhood experiences (PCEs) were assessed with 13 items from the Resilience Questionnaire (Rains & McClinn, 2013). Example items include, "When I was little, my mother/father loved me", and "My parents or guardians had the help of relatives, neighbors, or other people." Response options ranged from *not at all true* (1) to *completely true* (5). The response options 1–3 were recoded as 0 and 4–5 were recoded as 1. All items were summed to create a composite PCEs variable that ranged from 0–13. The 13-item scale was reliable (α = .88).

Attachment

Attachment qualities were assessed using Carver's (1997) Measure of Attachment Qualities (MAQ) scale. Response options ranged from *not at all true* (1) to *completely true* (5). As we have been specifically interested in the impact of insecure attachment styles on adult self-rated emotional support and mental health, the secure attachment sub-scale, while obviously important in attachment theory, was excluded from the data analysis as it was not relevant to the set hypotheses.

Avoidance was measured using three items from the avoidance sub-scale of the MAQ: we conducted a maximum likelihood exploratory factor analysis on the data of all five items originally included into the sub-scale, and found that two of the items did not load onto the same factor as the rest of the items; they were therefore omitted (see Online Appendix).

The items included were "I prefer not to be too close to others", "It's not hard for me to maintain closeness with others", and "I get uncomfortable when someone wants to be very close." The items were averaged to create an attachment avoidance composite variable that ranged from 1–5. The three-item scale's reliability was acceptable (α = .61). Dropping the reverse coded item improved reliability to α = .73, however, testing the models with the two-item version of attachment avoidance did not change the results, so the three-item variable is reported here.

Anxiety was measured via six items from the worry and merger anxiety sub-scales of the MAQ. A maximum likelihood factor analysis indicated that all six items load onto one factor (see Online Appendix). Example worry items include "I often worry that my partner doesn't really love me" and "I often worry my partner will not want to stay with me." Example merger items include "I have trouble getting others to be as close as I want them to be" and "I find others are reluctant to get as close as I would like." Because both worry and merger are indicative of anxious attachment, the two sub-scales were averaged to create an anxiety composite score for each participant that ranged from 1–5. The six-item scale was reliable (α = .79).

Self-Rated Emotional Support

A single item (cf. Bethell et al., 2019) assessed emotional support "How often do you receive emotional support when you need it?" Response options ranged from *never* (1) to *always* (5). On average, participants reported receiving emotional support above the scale midpoint.

Self-Rated Mental Health

A single item assessed mental health (Ahmad et al., 2014; Levinson & Kaplan, 2014; McAlpine et al., 2018) with the question, "My mental health is:" Response options ranged from *very poor* (1) to *very good* (5). On average, participants reported good mental health.

Data Analysis

Descriptive statistics and correlations were calculated. All study variables had skew and kurtosis values between -1.0 and +1.0, indicating normal distribution (see Table 1).

To analyze the proposed model (see Figure 1), two mediation and moderation models were tested using Hayes' (2017) PROCESS macro for SPSS (Model 85). Control variables included gender, age, education level, and the other type of attachment (avoidant attachment in the anxious model, anxious attachment in the avoidant model).

ACEs were included as the independent variable, avoidant (Model 1) and anxious (Model 2) attachment and self-rated emotional support as serial mediators, and mental health as the dependent variable (H1–3). Serial mediators (i.e., 1) avoidant or anxious attachment and 2) self-rated emotional support) create a hypothesized causal chain linking an independent variable with two or more mediating variables and then a dependent variable (see Figure 1 for depiction). PCEs were included as moderators in the relationships between ACEs and self-rated emotional support/mental health (H5). A moderator (i.e., PCEs) is predicted to change the relationship between an independent and dependent variable. PROCESS simultaneously tests the direct associations between moderators and outcomes. These statistics were used to answer H4. The Likert scales included in our models are similar to interval level data with evenly spaced response options (see Norman, 2010; Sullivan & Artino, 2013). As such, we used multiple regression to test our hypotheses.

Results

Descriptive Statistics

Table 1 includes descriptive statistics (mean, standard deviation, minimum and maximum values) for all scales, as well as correlations among the study variables.

Table 1. Descriptives and Bivariate Correlations

Variables (Min.-Max.)	Mean (*SD*)	Skewness (*SE*)	Kurtosis (*SE*)	1	2	3	4	5	6
1. ACEs (0–10)	2.37 (2.20)	.87 (.04)	-.06 (.07)	-					
2. PCEs (0–13)	8.94 (3.41)	-.79 (.04)	-.26 (.07)	-.51*	-				
3. Avoidance (1–5)	2.41 (.74)	.21 (.04)	.13 (.07)	.16*	-.24*	-			
4. Anxiety (1–5)	2.43 (.71)	.36 (.04)	.16 (.07)	.21*	-.25*	.42*	-		
5. Emo. Support (1–5)	3.56 (1.23)	-.50 (.04)	-.65 (.07)	-.25*	.38*	-.29*	-.33*	-	
6. Mental Health (1–5)	4.01 (.90)	-.83 (.04)	.57 (.07)	-.27*	.27*	-.31*	-.40*	.29*	-

Note. ACEs = adverse childhood experiences, PCEs = positive childhood experiences, Emo. Support = perceived emotional support. Pearson's correlation is reported for ACEs and PCEs. All other correlations are Spearman's rho.
*$p < .001$.
All significant correlations have p values less than .001.

Associations Between Sociodemographic Variables and Study Measures

Participant age had a weak negative association with PCEs ($\rho = -.11$, $p < .001$), avoidance ($\rho = -.05$, $p < .001$), anxiety ($\rho = -.15$, $p < .001$), and self-rated emotional support ($\rho = -.13$, $p < .001$) indicating that older participants reported fewer PCEs, lower avoidance and anxious attachment, and reduced emotional support. Age had a small positive association with mental health ($\rho = .13$, $p < .001$) indicating that older participants reported better mental health. Education level had a weak positive association with PCEs ($\rho = .15$, $p < .001$), perceived emotional support ($\rho = .09$, $p < .001$), and mental health ($\rho = .07$, $p < .001$). Education level had a weak negative association with ACEs ($\rho = -.08$, $p < .001$) and anxious attachment ($\rho = -.13$, $p < .001$).

Men and women significantly differed on ACEs, PCEs, avoidance and anxious attachment, self-rated emotional support, and mental health (see Table 2). Men reported higher PCEs and mental health whereas women reported higher ACEs, self-rated emotional support, avoidance and anxious attachment. Effect sizes for these differences were small. Due to significant differences by gender and the association of age and education level with the study variables, these variables were included as control variables in the subsequent models.

Table 2. Comparing Study Variables by Participant Gender

Variable	Women		Men		*t*	*df*	*p*	*d*
	M	*SD*	*M*	*SD*				
ACEs	2.61	2.35	2.14	2.01	7.47	4937	<.001	.21
PCEs	8.71	3.42	9.17	3.39	4.67	4818	<.001	.14
Avoidance	2.47	0.76	2.36	0.71	5.05	4923	<.001	.14
Anxiety	2.45	0.73	2.42	0.70	1.32	4923	.190	.04
Emo. Support	3.68	1.17	3.45	1.28	6.63	4937	<.001	.13
Mental Health	3.87	0.92	4.14	0.86	10.53	4937	<.001	.30

Note. Mann-Whitney was used to calculate difference scores for self-rated emotional support and mental health.
All other difference scores were calculated using t-tests.

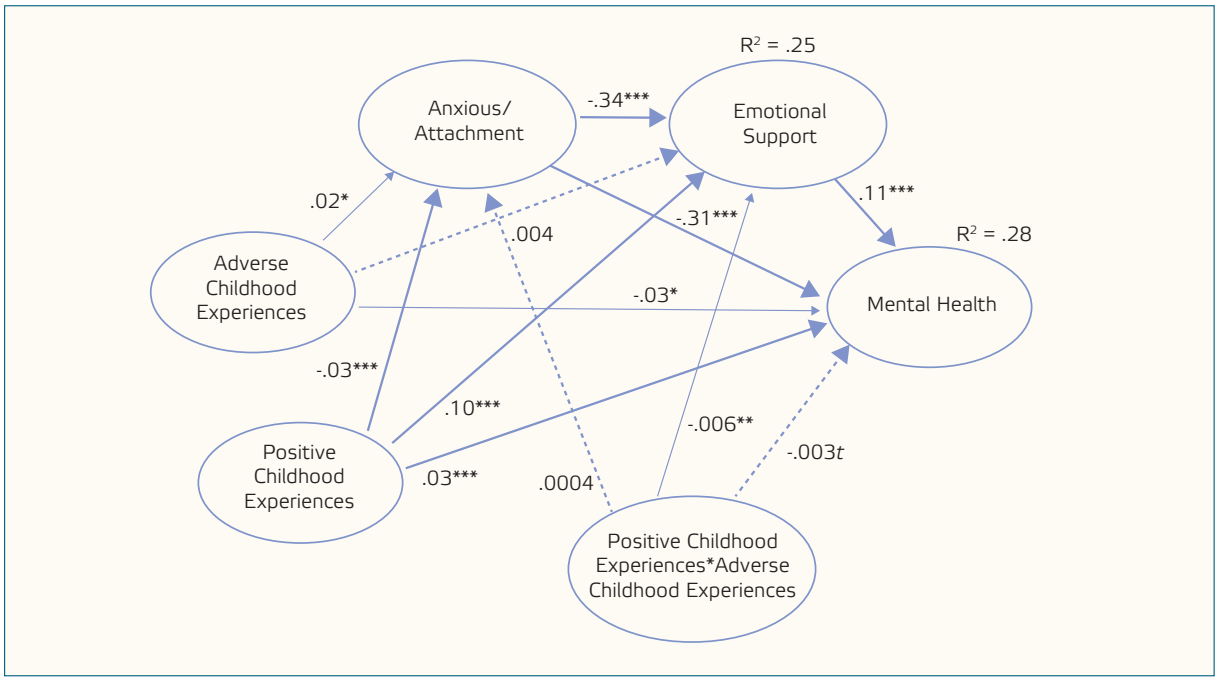
Cross-Correlations

ACEs had a moderate negative association with PCEs and weak negative associations with self-rated emotional support and self-rated mental health (see Table 1). ACEs had weak positive associations with attachment avoidance and anxiety. Avoidance and anxiety had weak negative associations with PCEs and weak-to-moderate negative associations with self-rated emotional support and good mental health.

Model Analyses

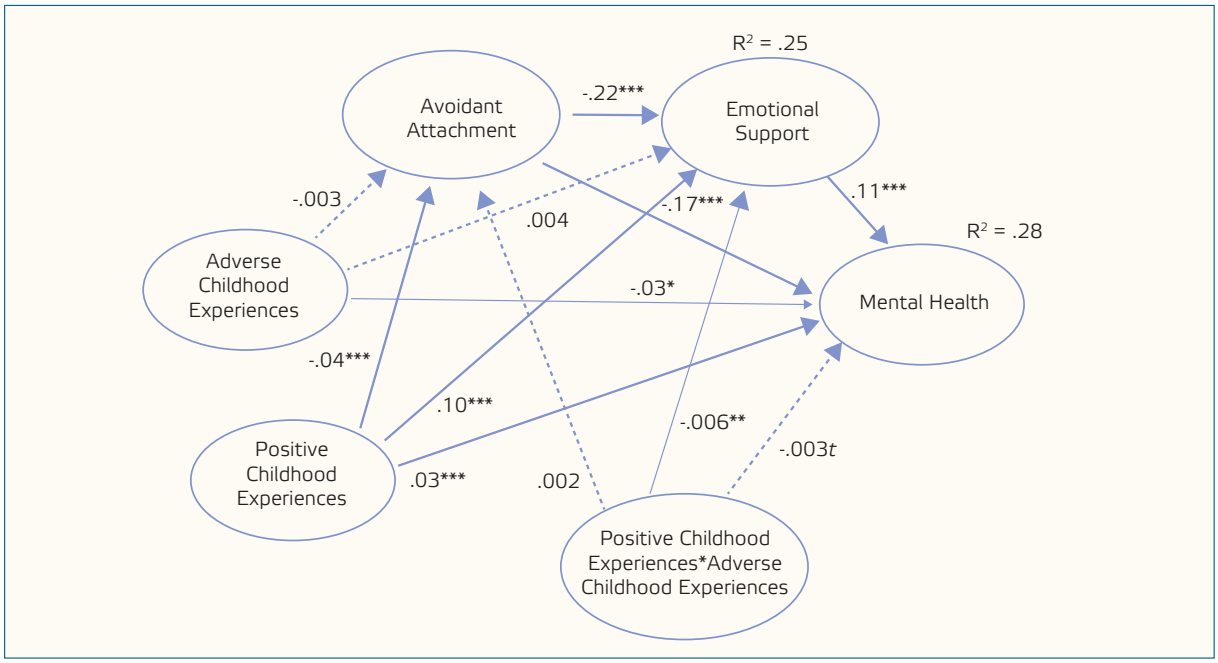
The models accounted for 24.9% of the variance in self-rated emotional support and 28.2% of the variance in mental health. The strongest pathways in the model were between the two types of attachment, perceived emotional support, and perceived mental health. ACEs and PCEs contributed less but indicated some significant trends. Model results are presented in Figures 2-3.

Figure 2. Anxious Attachment Serial Mediation and Moderation Model



Note. Dashed lines indicate nonsignificant paths, light lines indicate very small effect sizes that should be interpreted with caution. Effects (B) are unstandardized. Because the model including Avoidant Attachment as mediator includes Anxious Attachment as control variable and vice versa, the results of PCE and ACE on Emotional Support and Mental Health remain the same throughout the two models.

Figure 3. Avoidant Attachment Serial Mediation and Moderation Model



Note. Dashed lines indicate nonsignificant paths, light lines indicate very small effect sizes that should be interpreted with caution. Effects (B) are unstandardized. Because the model including Avoidant Attachment as mediator includes Anxious Attachment as control variable and vice versa, the results of PCE and ACE on Emotional Support and Mental Health remain the same throughout the two models.

ACEs' Direct Associations

H1 predicted that higher numbers of ACEs are negatively associated with self-rated (a) emotional support and (b) mental health. As predicted, ACEs had a weak and negative association with self-rated mental health but were not significantly associated with self-rated emotional support in either model (see Table 3). Only H1b was supported.

H2 predicted that higher levels of ACEs are positively associated with (a) avoidant and (b) anxious attachment. In the models, ACEs were not significantly associated with reports of avoidant attachment (H2a) but had a small positive association with reports of anxious attachment, thereby supporting H2b.

Table 3. ACE, PCE, Attachment, Perceived Emotional Support, and Mental Health Direct, Indirect, and Conditional Path Model Results

Path	*B*	*SE*	CI [lower, upper]
Avoidant Attachment Model			
Direct Paths			
ACE → Avoidant Attachment	-.003	.012	[-.026, .020]
ACE → Emotional Support	.004	.018	[-.032, .040]
ACE → Mental Health	-.029*	.013	[-.055, -.003]
PCE → Avoidant Attachment	-.040***	.005	[-.050, -.030]
PCE → Emotional Support	.103***	.008	[.088, .119]
PCE → Mental Health	.025***	.006	[.013, .036]
Avoidant Attachment → Emotional Support	-.219***	.022	[-.263, -.176]
Avoidant Attachment → Mental Health	-.169***	.016	[-.201, -.137]
Emotional Support → Mental Health	.105***	.011	[.085, .126]
ACE*PCE → Avoidant Attachment	.002	.001	[-.001, .004]
ACE*PCE → Emotional Support	-.006**	.002	[-.010, -.002]
ACE*PCE → Mental Health	-.003*t*	.002	[-.006, .000]
Indirect Paths			
ACE → Emotional Support → Mental Health	-.004*	.001	[-.006, -.002]
ACE → Avoidant Attachment → Mental Health	-.002	.001	[-.003, .001]
ACE → Avoidant Attachment → Emotional Support → Mental Health	-.0002	.001	[-.002, .000]
Anxious Attachment Model			
Direct Paths			
ACE → Anxious Attachment	.024*	.011	[.002, .046]
ACE → Emotional Support	.004	.018	[-.032, .040]
ACE → Mental Health	-.029*	.013	[-.055, -.003]
PCE → Anxious Attachment	-.030***	.005	[-.039, -.020]
PCE → Emotional Support	.103***	.008	[.088, .119]
PCE → Mental Health	.025***	.006	[.013, .036]
Anxious Attachment → Emotional Support	-.340***	.024	[-.386, -.294]
Anxious Attachment → Mental Health	-.312***	.018	[-.346, -.277]
Emotional Support → Mental Health	.105***	.011	[.085, .126]
ACE*PCE → Anxious Attachment	.0004	.001	[-.002, .003]
ACE*PCE → Emotional Support	-.006**	.002	[-.010, -.002]
ACE*PCE → Mental Health	-.003*t*	.002	[-.006, .000]
Indirect Paths			
ACE → Emotional Support à Mental Health	-.004*	.001	[-.007, -.002]
ACE → Anxious Attachment à Mental Health	-.009*	.002	[-.012, -.005]
ACE → Anxious Attachment → Emotional Support → Mental Health	-.001*	.000	[-.002, -.001]

Note: ACEs = adverse childhood experiences, PCEs = positive childhood experiences. Control variables include age, gender, education level, and the other attachment style. Because the model including Avoidant Attachment as mediator includes Anxious Attachment as control variable and vice versa, the results of PCE and ACE on Emotional Support and Mental Health remain the same throughout the two models.

*p < .05, **p < .01, ***p < .001, t indicates p < .100.

Attachment Mediation

H3 predicted that (a) avoidant and (b) anxious attachment and self-rated emotional support mediate the association between ACEs and self-rated mental health. Each model contained three indirect effects (see Figure 1). In the *avoidant attachment* model, the association between ACEs and self-rated mental health through emotional support was negative and significant. The association between ACEs and self-rated mental health through avoidant attachment was not significant, nor was the association between ACEs and mental health through both avoidant attachment and emotional support.

All three indirect effects were significant in the *anxious attachment* model. The association between ACEs and self-rated mental health through emotional support was negative and significant. The association between ACEs and self-rated mental health through anxious attachment was negative and significant. Finally, the association between ACEs and self-rated mental health through both anxious attachment and emotional support was negative and significant. H3 was partially supported (see Table 3).

PCE's Direct Association

H4 predicted that positive childhood experiences are negatively associated with (a) avoidant and (b) anxious attachment. As predicted, PCEs had a small negative association with avoidant attachment and anxious attachment, supporting H4a and H4b.

Moderation

H5 predicted that PCEs moderate (i.e., reduce) the direct negative association between ACEs and self-rated (a) emotional support and (b) mental health. In both models, the interaction between ACEs and PCEs related to emotional support was very small but negative and significant, indicating that PCEs moderated the association between ACEs and self-rated emotional support (see Figure 4). However, the moderation effect did not work in the proposed direction. The interaction between ACEs and PCEs related to self-rated mental health was not significant.

Figure 4. The Interaction of ACEs and PCEs On Perceived Emotional Support

Discussion

Our study aimed to decipher the role of adult insecure attachment (avoidant and anxious) and PCEs in the correlation between ACEs and self-rated mental health and emotional support in adulthood. Although our findings are consistent with previous literature, they also yield unique insights and contributions. It is important to note that we attempted to capture these constructs using brief screening procedures and measurement instruments rather than more in-depth, multilevel instruments. While this approach grants us a broad overview, it may not provide the depth and specificity of more comprehensive instruments. Therefore, our results should be interpreted with caution. That said, the strongest (and likely most important) associations were observed for the pathways between the two attachment styles, emotional support and mental health. Both types of attachment were negatively associated with perceived (a) emotional support, and (b) mental health. Pathways in the model from ACEs and PCEs contributed less but offered some significant indicative trends.

First, we found that ACEs have a weak but direct impact on self-rated mental health, confirming previous findings (Felitti et al., 1998; Hughes et al., 2017). However, in contrast to the reports of some studies with high-risk samples (Caravaca-Sanchez et al., 2019; Schüssler-Fiorenza Rose et al., 2016), our results did not show a significant direct association between ACEs and self-rated emotional support. This divergence might be due to our "low-risk sample", which is not specifically targeted at high-risk groups with known mental illness. Our sample might be considered "low-risk" given the low mean number of ACEs (M = 2.37 out of 10) and the relatively high perceived emotional support (M = 3.56 out of 5) reported by the participants. This may explain the lack of significant correlation between ACEs and self-rated emotional support, in contrast to the significant association between ACEs and self-rated mental health, which may be more sensitive to variation in a broader population. This observation warrants more focused future research to identify possible patterns in the relations between ACEs and perceived emotional support, perhaps taking into account the possible differences of perceived emotional support across different relationships. Our second hypothesis was only partially confirmed. While ACEs showed a weak positive association with anxious attachment, no such relationship was found with avoidant attachment. While this contradicts some previous studies (Erozkan, 2016; Taunton et al., 2021), it aligns with others (Hatton-Bowers et al., 2023). One possible explanation for this discrepancy lies in the nature of avoidant attachment, which can involve minimising the importance of negative life experiences (Muller, 2009); this may bias retrospective reports of ACEs submitted by avoidantly attached adults. Additionally, including disorganized attachment in the study might have revealed a stronger link between ACEs and attachment. It is also plausible that insecure attachment arises not only from ACEs but from other factors within or beyond the family environment (e.g., parental insensitivity), or that a different attachment measure could have yielded different results.

Although our third hypothesis was only partially supported, our study offers nuanced insights into the mediating role of different attachment styles in the relationship between ACEs, perceived emotional support and self-rated mental health in adults. Our analysis found a weak but significant pathway from ACEs, through attachment styles, to perceived emotional support and then to self-rated mental health that was significant only for anxious attachment. In contrast, the mediation pathway was not significant in the avoidant attachment model. A possible explanation for this finding could be that avoidant people are inherently less likely to reach out to their networks for emotional support or expect support availability from their networks, which could potentially affect the perceived emotional support. In both models, perceived emotional support acted as a significant mediator of the negative association between ACEs and mental health. This finding confirms the existing literature that underscores the importance of emotional support in mitigating the adverse effects of ACEs (Corcoran & McNulty, 2018; Lin et al., 2020; Widom et al., 2018). Furthermore, our study extends this discussion by highlighting the differential mediating role of anxious and avoidant attachment styles, thus providing a more nuanced understanding of how these factors interplay to influence self-rated mental health, a key indicator of overall health and well-being (McAlpine et al., 2018). However, these findings should be interpreted with caution given the small effect sizes and cross-sectional nature of our data. We argue that the observed associations provide a weak but valuable snapshot, suggesting plausible pathways that are theoretically consistent with existing literature. These findings highlight the necessity for longitudinal studies to examine the temporal dynamics of these relationships.

Consistent with previous research (Bethell et al., 2019), our findings highlight the protective role of positive childhood experiences (PCEs) in the context of adverse childhood events. In particular, our weak but significant findings consolidate the finding that PCEs are inversely related to avoidant and anxious attachment styles, supporting H4a and H4b. Our moderation analysis provides additional insights. While H5 assumed that PCEs would mitigate the negative impact of ACEs on self-rated emotional support *and* mental health, our findings

reveal a more complex picture. Specifically, we found that the interaction of ACEs and PCEs had a small but significant negative impact on perceived emotional support. When ACEs were low, high PCEs boosted perceived emotional support. However, for those who experienced high ACEs, PCEs did not boost perceived emotional support nearly as much. However, the expected moderation of the association between ACEs and mental health by PCEs was found to be at a trend level of significance (p = .082). This non-significant finding may be due to the inclusion of emotional support in the model containing mental health (indeed, when running the model without emotional support, this interaction was small but significant (p = .035). This means that PCE's impact on perceived mental health overall could be mediated or affected by other factors.

Strenghts and Limitations

One of this study's main strengths and limitations lay in the fact that self-rated emotional support and mental health were each measured with a single item. This approach allows for a straightforward and efficient assessment that captures the most important aspects of the constructs in question. However, it may also limit the ability to capture the full complexity and nuance of these experiences. The reliance on single-item measures may not fully grasp the variability and multidimensional nature of emotional support and mental health, thus compromising the depth of the results. Furthermore, the degree of avoidant attachment tendencies was assessed with only three items. While this approach is a useful screening tool to identify risk for avoidant tendencies, it may not be as in-depth and extensive as more comprehensive measures. Therefore, results related to avoidant attachment should be interpreted with caution. In addition, the effect sizes for indirect and moderating effects were small. Our large sample size likely influenced our ability to detect significance in small effects. Despite this, some direct effects were robust, including the link between attachment and perceived (a) emotional support and (b) mental health. In addition, our models accounted for 25% of the variance in emotional support and 28% of the variance in mental health, indicating their strength.

Besides, our study was based on self-reports with strengths and limitations as previously described, such as the use of the online research panel (Kuhar & Zager Kocjan, 2021). Respondents knew the topic of the survey before they agreed to participate, which can lead to motivation bias. Those who chose to participate may have a particular interest in the topic or personal experience with the issues discussed, which may bias the results. The fact that ACEs and PCEs were reported retrospectively, and attachment qualities, self-rated mental health and emotional support were reported as cross-sectional data should also be considered when reporting or generalizing findings. ACE's provided self-reports may be biased by concurrent mental health factors, such as depression and psychological distress (Colman et al., 2016). Attachment qualities were measured using self-report, which may bias responses (Brennan et al., 1998). Objectively measured ACEs and PCEs would allow researchers to explore their influence on attachment without concerns about attachment styles biasing retrospective accounts of parent-child interactions. A limitation regarding the self-rated measure of mental health is that somatic symptoms or physical complaints may influence the perceived state of mental health. However, subjective assessments of mental health can also capture symptoms, difficulties, and reactions to life events (e.g., the end of a love relationship) that are not classified as psychiatric disorders (Levinson & Kaplan, 2014; McAlpine et al., 2018). This broad perspective is valuable because many mental health challenges remain undiagnosed, and a single-item assessment on a five-point scale can serve as an effective screening tool to identify individuals who might benefit most from treatment (Mawani & Gilmour, 2010; McAlpine et al., 2018; Nguyen et al., 2015). This approach increases the prognostic importance of self-rated mental health, providing additional predictive value to outcomes such as mortality and future well-being.

Conclusion, Implications and Future Direction

This study examined the complex relations between both adverse and positive childhood experiences (i.e., ACEs and PCEs), adult attachment qualities, and outcomes in adulthood (i.e., self-rated mental health and emotional support). The results suggest that among a large number of Slovene adults, PCEs may help mitigate the negative associations between ACEs and the mentioned outcomes. In addition, the findings indicate that ACEs are associated with increased tendencies toward insecure attachment qualities whereas PCEs appear to be associated with reduced tendencies toward these insecure attachment patterns.

These findings can guide interventions for individuals with history of child adversity to (also) focus on addressing insecure attachments as intervention targets – not only for children (e.g., Bakermans-Kranenburg et al., 2003) but also for adults (Daniel, 2006). Insecure attachment can be effectively treated through various therapeutic interventions, such as Dyadic Developmental Psychotherapy (Hughes, 2017) or Emotionally Focused Therapy (Johnson & Greenman, 2006). Interventions could also involve a person's social network – not only to show them how to think differently about emotional support, but also to ensure that they actively seek support from their network. This could be particularly relevant for interventions aimed at couples and could focus not only on helping the person with the insecure attachment to be more receptive to the support available, but also on the "support person" adjusting their own behavior to facilitate this process. Furthermore, the findings suggest that clinical interventions for individuals with adverse childhood histories could benefit from a comprehensive understanding of how these experiences may influence their relationships and interactions in adulthood. In addition, the role of PCEs should be recognized and supported. This study provides initial evidence on the strength of PCEs, which could be fostered through various programs that aim to provide each child with at least one adult caregiver or "mentor" type relationship. Such a relationship can serve as a PCE and help reduce some of the negative effects of the possible ACEs that children may experience.

In order to build on the results of this study, future research should address several critical areas. Longitudinally gathered data would provide more nuanced insight into the dynamic interactions of ACEs, PCEs, attachment and their role in adulthood well-being. Although longitudinal data were not used in this study, the study variables were time-ordered (i.e., ACEs/PCEs occurred prior to our findings), which theoretically underpins our mediation models as a methodologically sound approach to examining the associations between these variables. Furthermore, we suggest that subsequent research utilize longitudinal designs to verify and extend our findings and provide a clearer picture of how these early experiences and attachment styles evolve over time, influencing perceived mental health and emotional support in adulthood.

Future research should include the severity of different types of mental health problems and consider whether perceptions of emotional support vary across the different networks in the person's life (e.g., they may feel very supported by their friends but not by their siblings). Additionally, it should also consider disorganized attachment which is associated with a particularly high vulnerability to later psychological difficulties, especially dissociative experiences (Brothers, 2014) – perhaps the relationship between ACEs and disorganized attachment would prove to be stronger. Future research should also distinguish between different types of ACEs (e.g., abuse, neglect, household dysfunction), as evidence suggests that different adversity types contribute to different outcomes, including attachment qualities (e.g., Widom et al., 2018). This distinction could lead to a more nuanced understanding of the specific impact each type of adversity produces on mental health and attachment.

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Author contribution

Metka KUHAR: conceptualization, design, methodology, funding acquisition, investigation, project administration, data management, interpretation, supervision, writing original draft, writing review and editing.
Elizabeth DORRANCE-HALL: conceptualization, design, methodology, formal analysis, interpretation, supervision, writing review and editing.
Simona PROSEN: conceptualization, interpretation, writing review and editing.

Declaration of interest statement

The authors have no conflicts of interest to disclose.

Ethical statement

This manuscript is the authors' original work.
All participants engaged in the research voluntarily and anonymously.
Their data are stored in coded materials and databases without personal data.
The studies involving human participants were reviewed and approved by the National Medical Ethics Committee, Ministry of Health of the Republic of Slovenia, n. 0120-236/2019/4.

Data availability statement
The data and the materials necessary to attempt to replicate the findings are accessible upon reasonable request from the first author. The analyses presented here were not preregistered. The analytic code necessary to reproduce the analyses presented in this paper is not publicly accessible.

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References

Afifi, T. O., & MacMillan, H. L. (2011). Resilience following child maltreatment: A review of protective factors. *Canadian Journal of Psychiatry, 56*(5), 266–272. https://doi.org/10.1177/070674371105600505

Ahmad, F., Jhajj, A. K., Stewart, D. E., Burghardt, M., & Bierman, A. S. (2014). Single item measures of self-rated mental health: A scoping review. *BMC Health Services Research, 14*, Article 398. https://doi.org/10.1186/1472-6963-14-398

Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Erlbaum.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5* (5th ed.). American Psychiatric Publishing. https://doi.org/10.1176/appi.books.9780890425596

Anda, R. F., Felitti, V. J., Bremner, J. D., Walker, J. D., Whitfield, C., Perry, B. D., Dube, S. R., & Giles, W. H. (2006). The enduring effects of abuse and related adverse experiences in childhood: A convergence of evidence from neurobiology and epidemiology. *European Archives of Psychiatry and Clinical Neuroscience, 256*, 174–186. https://doi.org/10.1007/s00406-005-0624-4

Anders, S. L., & Tucker, J. S. (2000). Adult attachment style, interpersonal communication competence, and social support. *Personal Relationships, 7*(4), 379–389. https://doi.org/10.1111/j.1475-6811.2000.tb00023.x

Baer, J. C., & Martinez, C. D. (2006). Child maltreatment and insecure attachment: A meta-analysis. *Journal of Reproductive and Infant Psychology, 24*(3), 187–197. https://doi.org/10.1080/02646830600821231

Bakermans-Kranenburg, M. J., van IJzendoorn, M. H., & Juffer, F. (2003). Less is more: Meta-analyses of sensitivity and attachment interventions in early childhood. *Psychological Bulletin, 129*(2), 195–215. https://doi.org/10.1037/0033-2909.129.2.195

Bellis, M. A., Hardcastle, K., Ford, K., Hughes, K., Ashton, K., Quigg, Z., & Butler, N. (2017). Does continuous trusted adult support in childhood impart life-course resilience against adverse childhood experiences - A retrospective study on adult health-harming behaviours and mental well-being. *BMC Psychiatry, 17*, Article 110. https://doi.org/10.1186/s12888-017-1260-z

Bethell, C., Jones, J., Gombojav, N., Linkenbach, J., & Sege, R. (2019). Positive childhood experiences and adult mental and relational health in a statewide sample: Associations across adverse childhood experiences levels. *JAMA Pediatrics, 173*(11), Article e193007. https://doi.org/10.1001/jamapediatrics.2019.3007

Bifulco, A., Kwon, J., Jacobs, C., Moran, P. M., Bunn, A., & Beer, N. (2006). Adult attachment style as mediator between childhood neglect/abuse and adult depression and anxiety. *Social Psychiatry and Psychiatric Epidemiology, 41*, 796–805. https://doi.org/10.1007/s00127-006-0101-z

Biggs, E. E., Carter, E. W., & Gustafson, J. (2017). Efficacy of peer support arrangements to increase peer interaction and AAC use. *American Journal on Intellectual and Developmental Disabilities, 122*(1), 25–48. https://doi.org/10.1352/1944-7558-122.1.25

Blain, M. D., Thompson, J. M., & Whiffen, V. E. (1993). Attachment and perceived social support in late adolescence: The interaction between working models of self and others. *Journal of Adolescent Research*, *8*(2), 226–241. https://doi.org/10.1177/074355489382006

Bowlby, J. (1980). *Attachment and loss: Vol. 2. Separation, anxiety and anger*. The Hogarth Press.

Bowlby, J. (1982). *Attachment and loss: Vol. 1. Attachment*. The Hogarth Press.

Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: An integrative overview. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46–76). The Guilford Press.

Brenning, K. M., & Braet, C. (2013). The emotion regulation model of attachment: An emotion-specific approach. *Personal Relationships*, *20*(1), 107–123. https://doi.org/10.1111/j.1475-6811.2012.01399.x

Brothers, D. (2014). Traumatic attachments: Intergenerational trauma, dissociation, and the analytic relationship. *International Journal of Psychoanalytic Self Psychology, 9*(1), 3–15. https://doi.org/10.1080/15551024.2014.857746

Caravaca-Sánchez, F, Fearn, N. E., Vidovic, K. R., & Vaughn, M. G. (2019). Female prisoners in Spain: Adverse childhood experiences, negative emotional states, and social support. *Health & Social Work*, *44*(3), 157–166. https://doi.org/10.1093/hsw/hlz013

Carver, C. S. (1997). Adult attachment and personality: Converging evidence and a new measure. *Personality and Social Psychology Bulletin*, *23*(8), 865–883. https://doi.org/10.1177/0146167297238007

Cassidy, J., & Berlin, L. J. (1994). The insecure/ambivalent pattern of attachment: Theory and research. *Child Development*, *65*(4), 971–991. https://doi.org/10.2307/1131298

Centers for Disease Control and Prevention. (n.d.). *Behavioural Risk Factor Surveillance System ACE data*. https://www.cdc.gov/violenceprevention/aces/ace-brfss.html

Cheong, E. V., Sinnott, C., Dahly, D., Kearney, P. M. (2017). Adverse childhood experiences (ACEs) and later-life depression: Perceived social support as a potential protective factor. *BMJ Open, 7*, Article e013228. https://doi.org/10.1136/bmjopen-2016-013228

Cicchetti, D., & Doyle, C. (2016). Child maltreatment, attachment and psychopathology: Mediating relations. *World Psychiatry, 15*(2), 89–90. https://doi.org/10.1002/wps.20337

Coble, H. M., Gantt, D. L., & Mallinckrodt, B. (1996). Attachment, social competency, and the capacity to use social support. In G. R. Pierce, B. R. Sarason, & I. G. Sarason (Eds.), *Handbook of Social Support and the Family* (pp. 141–172). Springer. https://doi.org/10.1007/978-1-4899-1388-3_7

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310–357. https://doi.org/10.1037/0033-2909.98.2.310

Collins, N. L., & Read, S. J. (1990). Adult attachment, working models, and relationship quality in dating couples. *Journal of Personality and Social Psychology, 58*(4), 644–663. https://doi.org/10.1037/0022-3514.58.4.644

Colman, I., Kingsbury, M., Garad, Y., Zeng, Y., Naicker, K., Patten, S., Jones, P. B., Wild, T. C., & Thompson, A. H. (2016). Consistency in adult reporting of adverse childhood experiences. *Psychological Medicine*, *46*(3), 543–549. https://doi.org/10.1017/S0033291715002032

Corcoran, M., & McNulty, M. (2018). Examining the role of attachment in the relationship between childhood adversity, psychological distress and subjective well-being. *Child Abuse & Neglect, 76*, 297–309. https://doi.org/10.1016/j.chiabu.2017.11.012

Crandall. A., Miller, J. R., Cheung, A., Novilla, L. K., Glade, R., Novilla, M. L. B., Magnusson, B. M., Leavitt, B. L., Barnes, M. D., & Hanson, C. L. (2019). ACEs and counter-ACEs: How positive and negative childhood experiences influence adult health. *Child Abuse & Neglect, 96*, Article 104089. https://doi.org/10.1016/j.chiabu.2019.104089

Crouch, E., Probst, J. C., Radcliff, E., Bennett, K. J., & McKinney, S. H. (2019). Prevalence of adverse childhood experiences (ACEs) among US children. *Child Abuse & Neglect*, *92*, 209–218. https://doi.org/10.1016/j.chiabu.2019.04.010

Cutrona, C. E. (1990). Stress and social support – In search of optimal matching. *Journal of Social and Clinical Psychology, 9*(1), 3–14. https://doi.org/10.1521/jscp.1990.9.1.3

Cutrona, C. E., & Russell, D. W. (1983). The provisions of social relationships and adaptation to stress. In W. H. Jones & D. Perlman (Eds.), *Advances in Personal Relationships, Vol. 1* (pp. 37–67). JAI Press.

Daniel, S. I. F. (2006). Adult attachment patterns and individual psychotherapy: A review. *Clinical Psychology Review, 26*(8), 968–984. https://doi.org/10.1016/j.cpr.2006.02.001

Dube, S. R., Felitti, V. J., Dong, M., Chapman, D. P., Giles, W. H., & Anda R. F. (2003). Childhood abuse, neglect, and household dysfunction and the risk of illicit drug use: The Adverse Childhood Experiences Study. *Pediatrics, 111*(3), 564-572. https://doi.org/10.1542/peds.111.3.564

Edwards, V. J., Holden, G. W., Felitti, V. J., & Anda, R. F. (2003). Relationship between multiple forms of childhood maltreatment and adult mental health in community respondents: Results from the Adverse Childhood Experiences study. *The American Journal of Psychiatry, 160*(8), 1453–1460. https://doi.org/10.1176/appi.ajp.160.8.1453

Erozkan, A. (2016). The link between types of attachment and childhood trauma. *Universal Journal of Educational Research, 4*(5), 1071–1079. https://doi.org/10.13189/ujer.2016.040517

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998): Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The adverse childhood experiences (ACE) study. *American Journal of Preventive Medicine, 14*(4), 245–258. https://doi.org/10.1016/S0749-3797(98)00017-8

Florian, V., Mikulincer, M., & Bucholtz, I. (1995). Effects of adult attachment style on the perception and search for social support. *The Journal of Psychology: Interdisciplinary and Applied, 129*(6), 665–676. https://doi.org/10.1080/00223980.1995.9914937

Haber, M. G. , Cohen, J. L., Lucas, T., & Baltes, B. B. (2007). The relationship between self-reported received and perceived social support: A meta-analytic review. *American Journal of Community Psychology, 39*(1–2), 133–144. https://doi.org/10.1007/s10464-007-9100-9

Hankin, B. L. (2005). Childhood maltreatment and psychopathology: Prospective tests of attachment, cognitive vulnerability, and stress as mediating processes. *Cognitive Therapy and Research*, *29*, 645–671. https://doi.org/10.1007/s10608-005-9631-z

Hatton-Bowers, H., McPherran Lombardi, C., Kemp, B., Decker, K. B., Amini Virmani, E., Brophy-Herb, H. E., & Vallotton, C. D. (2023). Risks and resources for college students' mental health: ACEs, attachment, and mindfulness. *Journal of American College Health, 71*(5), 1510–1521. https://doi.org/10.1080/07448481.2021.1942007

Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (2nd ed.). Guilford Publications.

Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology, 52*(3), 511–524. https://doi.org/10.1037/0022-3514.52.3.511

Hughes, D. (2017). Dyadic Developmental Psychotherapy (DDP): An attachment-focused family treatment for developmental trauma. *Australian and New Zealand Journal of Family Therapy 38*(4), 595–605. https://doi.org/10.1002/anzf.1273

Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A. , Mikton, C., Jones, L., & Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: A systematic review and meta-analysis. *The Lancet Public Health, 2*(8), e356–e366. https://doi.org/10.1016/S2468-2667(17)30118-4

Johnson, S. M., & Greenman, P. S. (2006). The path to a secure bond: Emotionally focused couple therapy. *Journal of Clinical Psychology, 62*(5), 597–609. https://doi.org/10.1002/jclp.20251

Kobak, R. R., & Sceery, A. (1988). Attachment in late adolescence: Working models, affect regulation, and representations of self and others. *Child Development, 59*(1), 135–146. https://doi.org/10.1111/j.1467-8624.1988.tb03201.x

Kuhar, M., & Zager Kocjan, G. (2021). Associations of adverse and positive childhood experiences with adult physical and mental health and risk behaviours in Slovenia. *European Journal of Psychotraumatology, 12*(1), Article 1924953. https://doi.org/10.1080/20008198.2021.1924953

Lahousen, T., Unterrainer, H. F., & Kapfhammer, H. P. (2019). Psychobiology of attachment and trauma: Some general remarks from a clinical perspective. *Frontieres in Psychiatry, 10*, Article 914. https://doi.org/10.3389/fpsyt.2019.00914

Levinson, D., & Kaplan, G. (2014). What does self-rated mental health represent. *Journal of Public Health Research, 3*(3), Article 287. https://doi.org/10.4081/jphr.2014.287

Lin, H.-C., Yang, Y., Elliott, L., & Green, E. (2020). Individual differences in attachment anxiety shape the association between adverse childhood experiences and adult somatic symptoms. *Child Abuse & Neglect, 101*, Article 104325. https://doi.org/10.1016/j.chiabu.2019.104325

Lyons-Ruth, K., Bureau, J.-F., Easterbrooks, M. A., Obsuth, I., Hennighausen, K., & Vulliez-Coady, L. (2013). Parsing the construct of maternal insensitivity: Distinct longitudinal pathways associated with early maternal withdrawal. *Attachment & Human Development, 15*(5–6), 562–582. https://doi.org/10.1080/14616734.2013.841051

Main, M., & Hesse, E. (1990). Parents' unresolved traumatic experiences are related to infant disorganized attachment status: Is frightened and/or frightening parental behavior the linking mechanism? In M. T. Greenberg, D. Cicchetti, & E. M. Cummings (Eds.), *Attachment in the preschool years: Theory, research, and intervention* (pp. 161–182). The University of Chicago Press.

Main, M., & Solomon, J. (1990). Procedures for identifying infants as disorganized/ disoriented during the Ainsworth Strange Situation. In M. T. Greenberg, D. Cicchetti, & E. M. Cummings (Eds.), *Attachment in the preschool years: Theory, research, and intervention* (pp. 121–160). The University of Chicago Press.

Masten, A. S., & Cicchetti, D. (2016): Resilience in development: Progress and transformation. In D. Cicchetti (Ed.), *Developmental psychopathology: Risk, resilience and intervention* (pp. 271–333). John Wiley & Sons.

Mawani, F. N., & Gilmour, H. (2010). Validation of self-rated mental health. *Health Reports, 21*(3), 61–75.

McAlpine, D. D., McCreedy, E., & Alang, S. (2018). The meaning and predictive value of self-rated mental health among persons with a mental health problem. *Journal of Health and Social Behavior, 59*(2), 200–214. https://doi.org/10.1177/0022146518755485

Mikulincer, M., & Florian, V. (1997). Are emotional and instrumental supportive interactions beneficial in times of stress? The impact of attachment style. *Anxiety, Stress, and Coping, 10*(2), 109–127. https://doi.org/10.1080/10615809708249297

Mikulincer, M., Florian, V., & Weller, A. (1993). Attachment styles, coping strategies, and post-traumatic psychological distress: The impact of the Gulf War in Israel. *Journal of Personality and Social Psychology, 64*(5), 817–826. https://doi.org/10.1037/0022-3514.64.5.817

Mikulincer, M., & Shaver, P. R. (2005). Attachment theory and emotions in close relationships: Exploring the attachment-related dynamics of emotional reactions to relational events, *Personal Relationships, 12*(2), 149–168. https://doi.org/10.1111/j.1350-4126.2005.00108.x

Mikulincer, M., & Shaver, P. R. (2007). *Attachment in adulthood: Structure, dynamics, and change*. The Guilford Press.

Mikulincer, M., & Shaver, P. R. (2012). An attachment perspective on psychopathology. *World Psychiatry, 11*(1), 11–15. https://doi.org/10.1016/j.wpsyc.2012.01.003

Muller, R. T. (2009). Trauma and dismissing (avoidant) attachment: Intervention strategies in individual psychotherapy. *Psychotherapy Theory, Research, Practice, Training, 46*(1), 68–81. https://doi.org/10.1037/a0015135

Muller, R. T., Thornback, K., & Bedi, R. (2012). Attachment as a mediator between childhood maltreatment and adult symptomatology. *Journal of Family Violence, 27*, 243–255. https://doi.org/10.1007/s10896-012-9417-5

Nguyen, C. P., Wong, Y. J., Juang, L. P., & Park, I. J. K. (2015). Pathways among Asian Americans' family ethnic socialization, ethnic identity, and psychological well-being: A multigroup mediation model. *Asian American Journal of Psychology, 6*(3), 273–280. https://doi.org/10.1037/aap0000026

Norman, G. (2010). Likert scales, levels of measurement and the "laws" of statistics. *Advances in Health Sciences Education*, *15*, 625–632. https://doi.org/10.1007/s10459-010-9222-y

Ognibene, T. C., & Collins, N. L. (1998). Adult attachment styles, perceived social support and coping strategies. *Journal of Social and Personal Relationships, 15*(3), 323–345. https://doi.org/10.1177/0265407598153002

Oshri, A, Sutton, T. E., Clay-Warner, J., & Miller, J. D. (2015). Child maltreatment types and risk behaviors: Associations with attachment style and emotion regulation dimensions. *Personality and Individual Differences, 73*, 127–133. https://doi.org/10.1016/j.paid.2014.09.015

Petruccelli, K., Davis, J., & Berman, T. (2019). Adverse childhood experiences and associated health outcomes: A systematic review and meta-analysis. *Child Abuse & Neglect, 97,* Article 104127. https://doi.org/10.1016/j.chiabu.2019.104127

Priel, B., & Shamai, D. (1995). Attachment style and perceived social support: Effects on affect regulation. *Personality and Individual Differences, 19*(2), 235–241. https://doi.org/10.1016/0191-8869(95)91936-T

Rains, M., & McClinn, K. (2013). *Resilience questionnaire*. https://csw.osu.edu/wp-content/uploads/2019/05/Garcia-Ashley-Handout.pdf

Riggs, S. A., Paulson, A., Tunnell, E., Sahl, G., Atkinson, H., Ross, C. A. (2007). Attachment, personality, and psychopathology among adult inpatients: Self-reported romantic attach-

ment style versus Adult Attachment Interview states of mind. *Development and Psychopathology, 19*(1), 263–291. https://doi.org/10.1017/S0954579407070149

Runtz, M. G., & Schallow, J. R. (1997). Social support and coping strategies as mediators of adult adjustment following child maltreatment. *Child Abuse & Neglect, 21*(2), 211–226. https://doi.org/10.1016/S0145-2134(96)00147-0

Sarason, B. R., Pierce, G. R., Shearin, E. N., Sarason, I. G., Waltz, J. A., & Poppe. L. (1991). Perceived social support and working models of self and others. *Journal of Personality and Social Psychology, 60*(2), 273–287. https://doi.org/10.1037/0022-3514.60.2.273

Schimmenti, A., & Bifulco, A. (2015). Linking lack of care in childhood to anxiety disorders in emerging adulthood: The role of attachment styles. *Child and Adolescent Mental Health*, *20*(1), 41–48. https://doi.org/10.1111/camh.12051

Schore, J. R., & Schore, A. N. (2008). Modern attachment theory: The central role of affect regulation in development and treatment. *Clinical Social Work Journal*, *36*(1), 9–20. https://doi.org/10.1007/s10615-007-0111-7

Schüssler-Fiorenza Rose, S. M., Eslinger, J. G., Zimmerman, L., Scaccia, J., Lai, B. S., Lewis, C., & Alisic, E. (2016). Adverse childhood experiences, support, and the perception of ability to work in adults with disability. *PLoS ONE*, *11*(7), Article e0157726. https://doi.org/10.1371/journal.pone.0157726

Sirois, F. M., Millings, A., & Hirsch, J. K. (2016). Insecure attachment orientation and well-being in emerging adults: The roles of perceived social support and fatigue. *Personality and Individual Differences, 101*, 318–321. https://doi.org/10.1016/j.paid.2016.06.026

Sperry, D. M., & Widom, C. S. (2013). Child abuse and neglect, social support, and psychopathology in adulthood: A prospective investigation. *Child Abuse & Neglect, 37*(6), 415–425. https://doi.org/10.1016/j.chiabu.2013.02.006

Statistical Office of the Republic of Slovenia SURS (2018). SI-STAT Data Portal. https://pxweb.stat.si/SiStat/sl

Sullivan, G. M., & Artino, A. R. (2013). Analyzing and interpreting data from Likert-type scales. *Journal of Graduate Medical Education*, *5*(4), 541–542. https://doi.org/10.4300/JGME-5-4-18

Švab, A., Rener, T., & Kuhar, M. (2012). Behind and beyond Hajnal's line: Families and family life in Slovenia. *Journal of Comparative Family Studies, 43*(3), 419–437. https://doi.org/10.3138/jcfs.43.3.419

Taunton, M., McGrath, L., Broberg, C., Levy, S., Kovacs. A. H., & Khan, A. (2021). Adverse childhood experience, attachment style, and quality of life in adult congenital heart disease. *International Journal of Cardiology Congenital Heart Disease*, *5*, Article 100217. https://doi.org/10.1016/j.ijcchd.2021.100217

Thornberry, T. P., Henry, K. L., Smith, C. A., Ireland, T. O., Greenman, S. J. & Lee, R. D. (2013). Breaking the cycle of maltreatment: The role of safe, stable, and nurturing relationships. *Journal of Adolescent Health*, *53*(4), S25–S31. https://doi.org/10.1016/j.jadohealth.2013.04.019

United Nations (2015). *Transforming our world: The 2030 agenda for sustainable development*. https://sdgs.un.org/2030agenda

van der Kolk, B. A., Roth, S., Pelcovitz, D., Sunday, S., & Spinazzola, J. (2005). Disorders of extreme stress: The empirical foundation of a complex adaptation to trauma. *Journal of Traumatic Stress, 18*(5), 389–399. https://doi.org/10.1002/jts.20047

Wallace, J. L., & Vaux, A. (1993). Social support network orientation: The role of adult attachment style. *Journal of Social and Clinical Psychology*, *12*(3), 354–365. https://doi.org/10.1521/jscp.1993.12.3.354

Widom, C. S., Czaja, S., Kozakowski, S., & Chauhan, P. (2018). Does adult attachment style mediate the relationship between childhood maltreatment and mental and physical health outcomes? *Child Abuse & Neglect, 76,* 533–545. https://doi.org/10.1016/j.chiabu.2017.05.002

World Health Organization. (2022). *Mental health.* https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response

Online Appendix

Online Table 1. Demographic Characteristics and Descriptive Statistics of Main Study Variables for the Total Sample

	Total sample	
	UnW No.	W % / *M (SD)*
Age	4,939	46.7 (15.3)
Gender		
Male	2,513	50.9
Female	2,426	49.1
Education		
Less than high school	1,886	38.2
High school	1,533	31.0
Post-secondary and graduate	1,236	25.0

Note. UnW = unweighted, W = weighted.

Online Table 2. Exploratory Factor Analysis Results for Anxious Attachment

Item	Factor Loading
Worry Subscale	
I often worry that my partner doesn't really love me.	.732
I often worry my partner will not want to stay with me.	.766
*I don't worry about others abandoning me.	.392
Desire for Merger Subscale	
I have trouble getting others to be as close as I want them to be.	.735
My desire to connection sometimes scares people away.	.507
I find others are reluctant to get as close as I would like.	.606

Note. *Reverse coded item.

Online Table 3. Exploratory Factor Analysis Results for Avoidant Attachment

Item	Factor Loading
I prefer not to be too close to others.	.790
I get uncomfortable when someone wants to be very close.	.727
I find it easy to be close to others.*	.315

Note. *Reverse coded item.

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RESEARCH ARTICLE

Psychometric Properties of the Hungarian UCLA Loneliness Scale Among Adolescents: A Search for the Meaning of Loneliness in the Young Population

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Introduction: Loneliness has been considered a major public health and policy concern, with substantial physical and mental health impacts. The University of California and Los Angeles Loneliness Scale (UCLA-LS) is one of the most widely used scales for measuring loneliness but it does not have robust psychometric properties among adolescents.
Aims: To evaluate the psychometric properties of the Hungarian UCLA-LS among adolescents.
Methods: The sample includes a total of 2508 students, 57.3% females, aged between 14 and 21 years. Studying psychometric properties, internal reliability and criterion-related validity were measured. The sample was randomly divided into two parts to examine the factorial structure: one part was used for exploratory factor analysis (EFA) and the other was used for confirmatory factor analysis (CFA).
Results: The UCLA-LS showed good internal consistency. Its total score and the single-item measure showed a small correlation, and also indicated a significant moderate association with hopelessness and self-reported well-being. Based on the EFA, we identified two factors with 51.7% of the total variance explained. In the CFA, the two-factor model demonstrated a good fit.
Conclusions: The findings suggested that the Hungarian UCLA-LS can be a reliable and valid tool for adolescents to measure some dimensions of loneliness. We confirmed the non-normal, relatively skewed distribution of the scale. We can conclude that the UCLA-LS measures a trait characteristic of loneliness. In the adolescent population, it is recommended to use further measures of loneliness to gain more information about the frequency and nature of the multi-faceted mental representation of loneliness.

Keywords: loneliness, adolescence, validity, reliability, UCLA Loneliness Scale

Introduction

The term loneliness is one of the uniquely human states which are hard to define but appear universal, it seems to be present in all cultures (Jones et al., 1985; Wilson et al., 1992). Although the commonly used definitions may differ somewhat, most of them incorporate certain elements such as an unpleasant subjective experience, when an

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individual perceives that the quality and/or quantity of their social network is insufficient (Hawkley & Cacioppo, 2010; Peplau & Perlman 1979). Based on recent studies, loneliness is a common experience worldwide with a pooled prevalence of 9.2% to 14.4% for adolescents, and the COVID-19 pandemic resulted in a small increase in loneliness (Barreto et al., 2021; Ernst et al., 2022; Surkalim et al., 2022).

Loneliness might be interrelated with living alone and social isolation, but it is distinct from these conditions (Lee & Ko, 2018), which are more objective, referring to the quantity of individuals' social interactions, and lack of or infrequent social connections. Based on a recently proposed conceptual model, different triggers, risk factors and correlates exist, such as demography, health, and socio-environmental factors, which can lead to "problematic" loneliness (Lim et al., 2020). At the same time, as loneliness is a subjective construct, while assessing loneliness, the phenomenological perspective of the individual must also be assessed (Peplau, 1985).

Most studies consider loneliness as trait-like since individual differences in loneliness showed stability similarly to personality traits (Mund et al., 2019). At the same time, based on the differential reactivity hypothesis (Cacioppo et al., 2003), the question has arisen: Do individuals who reported a higher level of loneliness in a questionnaire measure trait-like loneliness, experience loneliness constantly or does it manifest as a "different reactivity" to situations which sustains loneliness (Matthews et al., 2022; van Roekel et al., 2013)? Previous studies demonstrated that there is a difference between trait and state loneliness, and trait loneliness is affected by state loneliness in various social contexts, especially among adolescents (van Roekel et al., 2013, 2018).

Loneliness occurs across the entire lifespan (Franssen et al., 2020; Qualter et al., 2015); however, it tends to be more prevalent and severe during adolescence and in old age (Laasgard et al., 2016; Yang & Victor, 2011). Adolescence has special neurological and developmental changes, which may increase the risk of loneliness among adolescents. Adolescent loneliness is closely related to poor mental health, including depression, anxiety and even suicidal behaviour (Ladd & Ettekal, 2013; Lasgaard et al., 2011; Matthews et al., 2022). Furthermore, loneliness is not only linked to poor mental health but is also one of its risk factors (Lyyra et al., 2021).

Considerations regarding the Loneliness Measured by the University of California and Los Angeles Loneliness Scale (UCLA-LS)

The difficulties in conceptualizing loneliness are reflected in the operationalization of loneliness, that is: how to measure loneliness precisely and accurately? It is the subjective nature of loneliness that causes problems during self-reporting, i.e., it is affected by social desirability concerns (Russell et al., 1978).

Assessments of loneliness use either multiple items that do not explicitly use the words "lonely" or "loneliness", or single-item measures that directly ask the subjects to rate the frequency and/or severity of "feeling lonely" (Lee & Ko, 2018). These assessments use negative and/or positive wording, which may lead to problems during self-reporting, causing a systematic bias in responses (Russell et al., 1980). The choice of the test format also influences the interpretation of loneliness, because women are more likely to report loneliness answering a direct question, while men appear more "lonely" on the multiple-item scale, although only in the younger age groups (Nicolaisen & Thorsen, 2014).

The UCLA-LS is one of the most widely used scales for measuring loneliness. The scale has been adapted and validated in many different languages. Russell et al. (1978) developed the original UCLA-LS from an existing instrument of measuring loneliness by Sisenwein (1964), who espoused the view that loneliness is a perceived lack of meaningful personal relationships (Mahon & Yarcheski, 1990). The original version of UCLA-LS consisted of 20 statements that measured how lonely individuals described their experiences (Russell et al., 1978). Russel et al. (1980) revised the UCLA-LS including positively worded and non-lonely items, which do not include any reference to the words lonely or loneliness, to avoid systematic biases in responding such as acquiescence and social desirability due to the negative/ "lonely" direction. The final revised version, the UCLA-LS version 3 (Russel, 1996) contains more readable questions, having simplified the response format and wording of items. The UCLA-LS has a total score of 20 to 80 points, with higher scores indicating greater loneliness (Russel, 1996). Loneliness scores are not normally distributed, only a relatively small proportion of individuals receive high scores on the scale.

Theoretically, the UCLA-LS assumed the unidimensionality of loneliness; it may be a global measure concerning the subjective experiences of loneliness (Russell et al., 1980); however, several studies examined the factorial structure of loneliness, which remains rather controversial (Boffo, et al., 2012; Hartshorne, 1993; Mahon & Yarcheski, 1990). Based on the factorial results that have been conducted with a diverse population but have primarily involved college students and adults over the last few decades, researchers suppose that the scale might be multi-dimensional. The studies on factorial structure have found mostly two- or three-factor solutions. In the

two-factor solutions, the names of the factors were very similar, distinguishing the factors of intimate and social others (Mahon, et al., 1995; Wilson et al., 1992). However, a method artefact can also be assumed: a response set if the negatively or positively worded items consequently load on different factors (Mahon & Yarcheski, 1990). In the case of three-factor solutions, the names of the factors were different, which suggests some conceptual confusion (Hartshorne, 1993). The factors described different aspects of loneliness such as psychological, psychosocial, social loneliness and relational/collective connectedness (Adams et al., 1988; Austin, 1983; Boffo et al., 2012; Dussault et al., 2009; McWhirter, 1990). In sum, these studies raised the possibility that the UCLA-LS does not assess a general experience of loneliness, but rather a multi-faceted mental representation of social connection (Hawkley et al., 2005).

Due to the simple rating and the easy-to-use format of the UCLA-LS scale, it is also widely used in Hungary. Although an officially translated version of the UCLA-LS exists in Hungarian (Csóka et al., 2007), the scale has not been validated yet. Thus, it is commonly used as part of the validation regarding different measurements, but the lack of a valid Hungarian version of the UCLA-LS poses an important limitation on the studies.

The present study aims to evaluate the psychometric properties, reliability and validity of the UCLA-LS in Hungarian for adolescents, which is one of the most popular measures of loneliness for adolescents; although, for this measure, no robust psychometric properties have been proven in this age group (Cole et al., 2021). Another goal was to provide further results for the factorial structure of the UCLA-LS among adolescents.

Methods

Study Sample

A total of 2556 secondary school students participated in the survey from 66 public schools in 37 cities in nine regions of Hungary. 48 students were excluded because of missing data or lack of parental agreement, so the study sample includes a total of 2508 students, 57.3% (n = 1436) females. Due to the structure of the Hungarian education system, the age of secondary school students was between 14 and 21 years (M = 17.29, SD = 1.32).

Procedure

The schools that participated in the survey were selected by personal contacts and with the assistance of the National Faculty of Education (Nemzeti Pedagógus Kar). The questionnaire was made available to secondary school students after the approval granted by the school principals or the heads of the institutions. The survey was conducted during the second and third waves of the COVID-19 pandemic when public education in Hungary took the form of digital distance learning.

The 15-minute online survey was shared on a webpage and remained accessible for six weeks during the lockdown. The research team kept in contact with school principals and teachers who encouraged the students to complete the questionnaire. Consent information about the aims of the research was given online and parental consent was requested before completion. We excluded those students who did not have parental consent or submitted a negative parental response. This research was approved by the Ethical Committee of the Medical Research Council (TUKEB), Hungary, under ETK TUKEB ethical permission No. IV/3067- 3/2021/EKU.

Measurements

We used the revised UCLA Loneliness Scale (UCLA-LS, Version 3, Russell, 1996) which is officially translated into the Hungarian language (Csóka et al., 2007). The UCLA-LS consists of 20 items with a 4-point rating scale (1: never, 2: rarely, 3: sometimes, 4: always). The total score ranges from 20 to 80; the higher scores indicate greater loneliness.

For convergent validity, we used the Beck Hopelessness Scale (BHS) and self-reported well-being as well as the number of close friends.

BHS (Beck et al., 1974; Beck & Steer, 1988) is a self-report measure of the level of negative expectations about the future. The Hungarian version of BHS is a valid and reliable measure of hopelessness (Cronbach α = .91) in the Hungarian population, which demonstrated a one-factor model; the higher the total BHS score, the higher levels of hopelessness it reflects (Perczel-Forintos et al., 2001).

Self-reported well-being was measured with the question "How do you feel in general?" on a 4-point scale (1: I never feel well, 2: I am not really feeling well, 3: I feel somewhat well, 4: I feel very well).

For congruent validity, we used a single-item measure of loneliness, the question "Do you feel lonely?" on a 4-point scale (1: no, 2: sometimes, 3: quite often, 4: very often).

Data Analysis

Descriptive statistics were reported in mean, standard deviation and relative frequencies. First, we examined the UCLA-LS internal consistency reliability and the effects of gender and age on the loneliness score. To examine criterion-related validity, for congruent validity, we calculated correlation coefficients between the scale and the items as well as the single-item measure of loneliness ("I feel lonely"). For convergent validity, we examined the relationship between loneliness and hopelessness, the number of close friends and self-reported well-being.

To examine the factorial structure, the sample was randomly divided into two parts: one part was used for exploratory factor analysis (EFA), and the other part was used for confirmatory factor analysis (CFA). EFA was conducted with Maximum Likelihood as the factor extraction method, and Kaiser criterion, Kaiser's eigenvalue-greater-than-one rule, was used for electing the numbers of factors retained. During EFA, to explore the dimensionality of the scale, first we used oblique rotation (Direct Oblimin), and the selection of factor numbers was verified using orthogonal rotation (Varimax) as recommended by Mahon et al. (1995). During CFA, with maximum likelihood with a robust standard errors (MLR) estimator, we tested the two- and three-factor solutions revealed in previous studies and compared them to the factorial structure explored in EFA. We used the test for exact fit (χ^2), SRMR (standardized root mean square residual) and RMSEA (root mean square error of approximation) for testing the fit of the model in CFA. To test and compare the previous two- and three-factor models in the Hungarian young sample, we used AIC (Akaike information criterion), BIC (Bayes information criterion), CFI (Comparative fit index) and TLI (Tucker–Lewis index). We used the following cut-off criteria for fit indexes by Hu and Bentler (1999), MacCallum et al. (1996), and Schreiber et al. (2006): CFI ≥ .95 for acceptance, TLI ≥ .95, SRMR ≤ .08, RMSEA ≤ .06 to .08 with confidence interval; for AIC and BIC, there is no cut-off value, the smaller the better.

The level of significance was set at $\alpha = .05$ (statistically significant results $p < .05$). For practical significance, we used effect size measurements for all statistical tests. Statistical analyses were performed using IBM SPSS Statistics for Windows, Version 25.0 (IBM Corp. Released 2017, Armonk, NY, USA) and jamovi (Version 2.2.2, The jamovi project, 2021).

Table 1. Descriptive statistics for items of the UCLA-LS

	M	*SD*	Skewness	Kurtosis
UCLA-LS1	1.67	0.82	0.99	0.11
UCLA-LS2	3.13	0.95	-0.78	-0.44
UCLA-LS3	1.66	0.88	1.15	0.30
UCLA-LS4	2.38	1.12	0.12	-1.35
UCLA-LS5	1.75	0.98	1.07	-0.07
UCLA-LS6	1.92	0.92	0.65	-0.55
UCLA-LS7	1.56	0.84	1.37	0.87
UCLA-LS8	2.14	0.96	0.42	-0.80
UCLA-LS9	1.72	0.92	1.05	0.03
UCLA-LS10	1.33	0.66	1.98	3.29
UCLA-LS11	1.92	0.91	0.69	-0.44
UCLA-LS12	1.89	0.91	0.71	-0.40
UCLA-LS13	2.06	1.06	0.54	-0.99
UCLA-LS14	1.86	0.98	0.84	-0.43
UCLA-LS15	2.26	1.02	0.27	-1.06
UCLA-LS16	1.55	0.82	1.35	0.87
UCLA-LS17	1.81	0.99	0.94	-0.32
UCLA-LS18	1.98	0.98	0.66	-0.65
UCLA-LS19	1.33	0.66	2.04	3.61
UCLA-LS20	1.37	0.71	1.91	2.83

Notes. Sample size, $N = 2508$.

Results

Descriptive Statistics and Reliability of Hungarian UCLA-LS

The descriptive statistics for items are presented in Table 1, for the frequency distribution of UCLA-LS scale scores, see Supplementary Table 1.

The UCLA-LS showed good internal consistency, Cronbach's alpha coefficient was .87[.87; .88]. The correlation coefficients for the items' score and the total score of the UCLA-LS ranged from .25 to .71, from small to large correlation, except for Item 2, which showed a significant but very small correlation with the total score (.12). Intercorrelations among 20 items were small among most of the items with .27[.26; .28] of average inter-item correlation (see Supplementary Table 2).

The total score of UCLA-LS ranged from 20 to 77 (M = 37.29, SD = 9.87, Skewness *(SE)* = .78(.05), Kurtosis *(SE)* = .18(.10). Gender showed a statistically significant main effect (F (1, 2504) = 9.82, p = .002, η^2_p = .004) but the mean difference (1.37) between females (M = 37.87, SD = 9.88) and males (M = 36.50, SD = 9.82) was negligible. Age revealed a non-significant main effect (F (1, 2504) = 3.60, p =.058, η^2_p =.001), and Gender x Age interaction was also non-significant (F (1, 2504) = 3.20, p = .074, η^2_p = .001).

Criterion-Related Validity of Hungarian UCLA-LS

For criterion-related validity, convergent and congruent validity were examined. For congruent validity, assessing the similarity of UCLA-LS to other constructs that it theoretically should be similar to, a single-item measure of loneliness was used. For convergent validity, the association of the UCLA-LS with constructs that are theoretically distinct from hopelessness but should still be related to it, such as the number of close friends and self-reported well-being, was examined.

First, we examined the gender and age differences on the single-item measure of loneliness, hopelessness, as well as the number of close friends and self-reported well-being. Very small/small differences emerged between gender and age groups in these measurements (Supplementary Table 3 and Table 4); thus, we examined the criterion-related validity using the total sample of the Hungarian young population.

Congruent validity

We calculated correlation coefficients between the UCLA-LS total and items score as well as the single-item measure of loneliness. The UCLA-LS total score and the single-item measure indicated a statistically significant, positive small correlation (ρ (2506) = .39, p < .001). Examining the correlation between the UCLA-LS items and the single-item measure, six items showed a statistically significant but very small/small association. Further items revealed a small to moderate correlation with the single-item measure, correlation coefficients ranged from .21 to .39 (Supplementary Table 5).

Convergent validity

The total score of the UCLA-LS suggested a significant positive moderate correlation with hopelessness (ρ (2506) = .46, p < .001), for the items, correlation coefficients ranged from .08 to .33. The total score revealed a significant negative small/moderate correlation with the number of close friends (ρ (2506) = –.33, p < .001) and self-reported well-being (ρ (2506) = –.49, p < .001). In the case of items, correlation coefficients ranged from –0.33 to 0.04 with the number of close friends and ranged from –0.44 to –0.09 with self-reported well-being (Supplementary Table 5).

The Factorial Structure of the Hungarian UCLA-LS

Based on the previous findings, the factorial structure of the UCLA-LS still remains in question, i.e., how many factors exist and which items are related to these factors; there is no strong model assumption for CFA. Thus, in line with the recommendations for adaptation and scale development studies (Bandalos & Finney, 2010; Kline, 2011), EFA was run first and then CFA to prove the validity of the structure.

The sample was divided into two parts randomly; one part was used for EFA, and one part was used for CFA. For the random samples' characteristics, see Table 2.

Table 2. Characteristics of the random samples

	Random sample 1 EFA (n = 1239)		Random sample 2 CFA (n = 1269)	
Females, *n* (%)	717	(57.9)	719	(56.7)
Age, *M(SD)*	17.29	(1.32)	17.28	(1.28)
UCLA-LS, *M(SD)*	37.77	(9.95)	36.82	(9.77)
UCLA-LS, Cronbach's α	.87		.87	

Exploratory factor analysis

The UCLA-LS items were subjected to exploratory factor analysis (maximum likelihood extraction). At first, we used an oblique rotation (Direct Oblimin), and then we used Varimax orthogonal rotation to verify the selection of the factor numbers. Items were excluded during factor extraction if their communalities were below 0.25. We used a rotated factor matrix to interpret the extracted factors, and items were excluded at this step if they did not meet the following criteria for item factor loadings by Pedhauser and Schemklin (1991): each item has high loading on one factor only and each factor has high loading for only some of the items.

Based on the results of the EFA, we identified two factors with 51.7% of the total variance explained. After rotation, Factor 1 explained 26.8% of the total variance and Factor 2 explained 24.9% of the total variance. The goodness-of-fit test was significant, but the chi-squared value was relatively low ($\chi^2(26) = 131.60$, $p < .001$). Factor 1 can be interpreted as Social Isolation and Factor 2 as Social Connectedness. The factorial solution is presented in Table 3.

Table 3. Factor structure of the Hungarian UCLA-LS and psychometric characteristics of the factors

	Factors	
	1	2
	Social Isolation	Social Connectedness
UCLA-LS11 - I feel left out	**.686**	.180
UCLA-LS12 - My social relationships are superficial	**.522**	.159
UCLA-LS13 - No one really knows me well	**.572**	.209
UCLA-LS14 - I feel isolated from others	**.774**	.189
UCLA-LS17 - I am unhappy being so withdrawn	**.561**	.135
UCLA-LS18 - People are around me but not with me	**.712**	.206
UCLA-LS10 - There are people I feel close to (R)	.189	**.692**
UCLA-LS16 - There are people who really understand me (R)	.272	**.666**
UCLA-LS19 - There are people I can talk to (R)	.183	**.809**
UCLA-LS20 - There are people I can turn to (R)	.213	**.848**
M(SD)	11.74(4.28)	5.63(2.43)
Skewness	0.63	1.69
Kurtosis	-0.26	2.31
Cronbach's α	.82	.86

Notes. (R): revised items during coding.

Confirmatory factor analysis

In the CFA, the two-factor model showed a good fit. The chi-square value was 199 (*df* = 34) with a relatively low χ^2/df (5.85). The SRMR was below .08 (.03) and the RMSEA was below .06 to .08 with the confidence interval [.06 (.05;.07)] representing a good fit.

Based on the result of the testing, comparing the two-factor structure explored in EFA with previous two-, and three-factor models, the two-factor model revealed the smallest value of AIC, BIC, and ≥ 0.95 CFI (.97), TLI (.96) values (Supplementary Table 6).

Finally, we also examined the EFA factors' correlation with hopelessness, the number of close friends, and self-reported well-being. All correlations were statistically significant ($p < .001$), but the magnitude of correlations between factors and the number of close friends was small (Social isolation: –.28, Social connectedness: –.25). The Social isolation factor revealed a positive moderate correlation with hopelessness (.44) and a negative moderate correlation with self-reported well-being (–.51). The Social connectedness factor's correlations with hopelessness (.35) and self-reported well-being (–.28) were also small. The factors showed a statistically significant, positive small correlation with the single-item measure of loneliness (Social isolation: ρ (2506) = .39, $p < .001$; Social connectedness: ρ (2506) = .26, $p < .001$).

Discussion

The present study's main aim was to evaluate the psychometric properties of UCLA-LS in Hungarian. The UCLA-LS is the most widely used measure of loneliness in adolescents, but it does not have robust psychometric properties (Cole et al., 2021). We used a relatively large sample of adolescents; thus, our study provides further results for the psychometric properties of the UCLA-LS in this age group.

The findings suggested that the Hungarian UCLA-LS can be a reliable and valid tool for adolescents to measure some dimensions of loneliness. Among adolescents, we did not find gender and age (early vs. late adolescence) differences. Previous studies examining gender differences demonstrate mixed findings; it can be assumed that mean levels of loneliness are similar for males and females across the lifespan (Maes et al., 2019; Vanhalst et al., 2013). In the case of age differences, a U-shaped age distribution was found in the loneliness frequency from young adulthood to old age. However, loneliness can be relatively stable from mid-to-late adolescence (Vanhalst et al., 2013; Yang & Victor, 2011).

Based on the results of the factor analysis, we identified two factors, Social isolation and Social connectedness. Our results suggest that the UCLA-LS measures some dimensions of loneliness among adolescents, not loneliness per se. We also experienced wording problems, namely items that loaded on one factor were negatively worded and items that loaded on the other factor were positively worded. We assumed that it was not due to method artefact, response set as suggested by Mahon et al. (1995). At the same time, these results pose the question of why negatively worded items relate to the term isolation and positively worded items relate to the term connectedness. We can hypothesize the possibility of some cognitive bias among adolescents such as negativity bias. Further studies revealed that significant attentional and memory biases exist in lonely individuals which induce passive behaviour and social withdrawal (Bangee & Qualter, 2018; Spithoven et al., 2017). In our sample, we also compared adolescents who reported "very/quite often feel lonely" to adolescents who reported "sometimes feel lonely" on the single-item measure of loneliness. Based on the results, "very/quite often feel lonely" adolescents showed significantly higher scores than those who "sometimes feel lonely" on the Social isolation factor which contains negatively worded items. The difference between these groups was small in the case of the Social connectedness factor which includes positively worded items.

The Hungarian UCLA-LS has a good internal consistency, consistent with previous studies (Adams et al., 1988; Austin, 1983; Boffo et al., 2012; Dussault et al., 2009; Mahon et al., 1995; McWhirter, 1990; Wilson et al., 1992;), but the intercorrelation among items was only small/moderate. In line with previous studies (Mahon et al., 1995; Russell, 1996; Wongpakaran et al., 2020) and providing further results, we found associations between the loneliness scale and some related constructs such as hopelessness and self-reported well-being. At the same time, contrary to our expectations, we found a small to moderate correlation between loneliness and the number of friends. It is important to outline that examining the two factors revealed in EFA and confirmed in CFA, the Social isolation factor indicated a large association with hopelessness and self-reported well-being, and the correlations with the Social connectedness factor were small/very small.

Contrary to some previous empirical results revealing a large association between loneliness measured by the UCLA-LS and the single-item measure, we found a very small to moderate relationship between these measurements of loneliness. Our results may suggest that the construct measured by the UCLA-LS is different from what a direct question of loneliness, the term lonely means for adolescents. The scale items do not refer specifically to loneliness; thus Russell (1982) observed that the scale does not directly measure states that people might label lonely. It is important to highlight that the time of the survey was during the COVID-19 pandemic, the period of school closures and distance learning. It can be assumed that in this critical situation, students would be more "sensitive" to the questionnaire's wording and were more likely to experience what it means to "feel lonely". Furthermore, it can also be supposed that the findings can represent more realistically what loneliness means for adolescents as measured by the UCLA-LS. These assumptions were partially demonstrated by the results of the single-item loneliness measure, which did not show a higher frequency of "loneliness" among adolescents.

Theoretically, loneliness is a single and unitary, i.e., unidimensional phenomenon (Russel, 1982) but based on the results of previous research (Adams et al., 1988; Austin, 1983; Dussault et al., 2009; Mahon et al., 1995; McWhirter, 1990; Wilson et al., 1992) our results also raised the possibility of the dimensionality of loneliness. Different commonly used definitions of loneliness share some same elements, but the term loneliness has a significant subjective nature; thus, it is not surprising that our results are only partially consistent with the previous studies on the scale's psychometric properties.

A further issue that arises in the literature is whether the construct assessed by loneliness questionnaires represents a trait or a state (Matthews et al., 2022; van Roekel et al., 2013, 2018). Based on our results, we can conclude that the direct question, the single-item measure of loneliness can refer to the state of loneliness, and the UCLA-LS can rather measure the trait loneliness. The previous studies (Hartshorne, 1993; Russell, 1996) on the psychometric characteristics of the UCLA-LS such as non-normal, bimodal characteristics of the scale may support this assumption, i.e., a relatively small proportion of individuals receive a high score as we also experienced in the present study. On the UCLA-LS, it is difficult to give meaning to a middle score, that is: a medium/moderate amount of loneliness (Cacioppo & Patrick, 2008). There is a need for further results to confirm bimodal characteristics of loneliness or provide meaningful cut-offs using a clinical sample with prolonged/chronic loneliness and suffering from personality disorders such as borderline and schizoid personality disorders.

Irrespective of the dimensionality of UCLA-LS, it has been not clear yet whether loneliness is unidimensional or multidimensional; furthermore, loneliness could be a form of, a contributor to, or a result of mental ill health. With a stronger base for understanding the nature of loneliness, we could screen and identify those in need of extra support and prevent the concurrent and prolonged mental health problems that are linked to loneliness (Cole et al., 2021), especially at a young age.

Strenghts and Limitations

The strength of the present study is that it uses a relatively large sample of adolescents and the secondary school students who participated in the survey belonged to 66 public schools in 37 cities in nine regions of Hungary which enhances the generalizability of the present findings.

There are also some limitations of the present study. These include the fact that all data were collected online, and the students completed the questionnaires voluntarily in a cross-sectional survey; thus, it is not possible to make any causal inferences. Besides selection bias, further response bias may be caused by misinterpreting the questions, and giving socially acceptable responses, consent responses or even extreme responses.

In the present study, we could not provide results on the test-retest reliability which is a further limitation of our study. It is recommended to examine test-retest reliability not only for UCLA-LS but also for the single-item measures of loneliness. Such analyses could support the trait characteristics of the UCLA-LS and the state characteristics of a single-item measure of loneliness. This assumption is partly proved by the results of congruent validity in the present study.

It is important to highlight the fact that, although we consider this to be a strength rather than a weakness in searching for the meaning of the UCLA-LS construct, the questionnaire was completed on one of the most vulnerable populations, adolescents. Furthermore, the time of the survey was during a pandemic, during the period of school closures and distance learning. It is assumed that in this critical situation, in a crisis, the results of the questionnaire are more indicative, more realistic, of what loneliness means for adolescents. They would be more "sensitive" to the wording of the questionnaire, and social isolation, especially in the case of those students who have more fragile, illusory friendships. They were more likely to experience what it means to feel lonely compared to normal times. It is recommended to examine the psychometric properties of the UCLA-LS in another less sensitive period. At the same time, it is important to note that they did not report loneliness with a higher frequency on the single-item measure of loneliness; thus, we assume that the UCLA-LS items have a different meaning for adolescents than the meaning of the direct question on the term lonely.

Conclusion, Implications, and Future Directions

Given the increasing prevalence of loneliness among adolescents and young people, there is a need for effective interventions and for this, we have to use a reliable and valid assessment of loneliness for the young population to screen and identify those who need special support. Thus, the main purpose of the present study was to evaluate the psychometric properties, reliability and validity, of the UCLA-LS in Hungarian for adolescents, and another aim was to provide further results for the factorial structure of the UCLA-LS among adolescents. The survey was conducted during the second and third waves of the COVID-19 pandemic when public education in Hungary took the form of digital distance learning. The present findings show high internal consistency and convergent validity of the Hungarian UCLA-LS among adolescents. We also confirmed the non-normal, relatively skewed distribution of the scale, consistent with previous studies. We demonstrated a two-factor

model from which we can conclude that UCLA-LS measures some dimensions of loneliness such as Social isolation and Social connectedness. Based on the results of validity, we suggest that the UCLA-LS measures a trait characteristic of loneliness. The direct question, the single-item measure of loneliness may refer to rather a state of loneliness, which is recommended to be measured to gain more information about the nature and frequency of loneliness among adolescents. Irrespective of the controversial dimensionality of the scale, the Hungarian UCLA-LS has good reliability and validity; thus, it can be used in measuring loneliness among Hungarian adolescents.

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Author contribution
Johanna TAKÁCS: conceptualization, design, methodology, formal analysis, interpretation, writing original draft.
Zsolt Bálint KATONA: conceptualization, design, methodology, investigation, data management, writing review and editing.
Ferenc IHÁSZ: conceptualization, design, methodology, supervision, writing review and editing.

Declaration of interest statement
The authors have no conflicts of interest to disclose.

Ethical statement
The authors assert that all procedures contributing to this study comply with the ethical standards of the relevant national and institutional committees on human experiments and with the Helsinki Declaration of 1975, as revised in 2008. This research was approved by the Ethical Committee of the Medical Research Council (TUKEB), Hungary, under ETK TUKEB ethical permission No. IV/3067- 3/2021/EKU. Informed consent to participate was taken from all participants and their parents for minors to participate in the study. Their data are stored in coded materials and databases without personal data.

Data availability statement
Datasets presented in this article are available from the corresponding author upon reasonable request.

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References

Adams, G. R., Openshaw, D. K., Bennion, L., Mills, T., & Noble, S. (1988). Loneliness in late adolescence: A social skills training study. *Journal of Adolescent Research*, *3*(1), 81–96. https://doi.org/10.1177/074355488831007

Austin, B. A. (1983). Factorial structure of the UCLA Loneliness Scale. *Psychological Reports*, *53*(3), 883–889. https://doi.org/10.2466/pr0.1983.53.3.883

Bandalos, D. L., & Finney, S. J. (2010). Factor analysis: Exploratory and confirmatory. In G. R. Hancock, L. M. Stapleton, & R. O. Mueller (Eds.), *The reviewer's guide to quantitative methods in the social sciences* (pp. 93–114). Routledge.

Bangee, M., & Qualter, P. (2018). Examining the visual processing patterns of lonely adults. *Scandinavian Journal of Psychology*, *59*(4), 351–359. https://doi.org/10.1111/sjop.12436

Barreto, M., Victor, C., Hammond, C., Eccles, A., Richins, M. T., & Qualter, P. (2021). Loneliness around the world: Age, gender, and cultural differences in loneliness. *Personality and Individual Differences*, *169*, Article 110066. https://doi.org/10.1016/j.paid.2020.110066

Beck, A. T., Weissman, A., Lester, D., & Trexler, L. (1974). The measurement of pessimism: The hopelessness scale. *Journal of Consulting and Clinical Psychology*, *42*(6), 861–865. https://doi.org/10.1037/h0037562

Beck, A. T., & Steer, R. A. (1988). *Manual for the Beck Hopelessness Scale.* San Antonio, TX: Psychological Corp.

Boffo, M., Mannarini, S., & Munari, C. (2012). Exploratory structure equation modeling of the UCLA Loneliness Scale: A contribution to the Italian adaptation. *TPM-Testing, Psychometrics, Methodology in Applied Psychology*, *19*(4), 345–363.

Cacioppo, J., & Patrick, W. (2008). *Loneliness: Human nature and the need for social connection*. W.W. Norton & Company.

Cacioppo, J. T., Hawkley, L. C., & Berntson, G. G. (2003). The anatomy of loneliness. *Current Directions in Psychological Science, 12*(3), 71–74. https://doi.org/10.1111/1467-8721.01232

Cacioppo, J. T., Hawkley, L. C., & Thisted, R. A. (2010). Perceived social isolation makes me sad: 5-year cross-lagged analyses of loneliness and depressive symptomatology in the Chicago Health, Aging, and Social Relations Study. *Psychology and Aging*, *25*(2), 453–463. https://doi.org/10.1037/a0017216

Cole, A., Bond, C., Qualter, P., & Maes, M. (2021). A systematic review of the development and psychometric properties of loneliness measures for children and adolescents. *International Journal of Environmental Research and Public Health*, *18*(6), Article 3285. https://doi.org/10.3390/ijerph18063285

Csóka, Sz., Szabó, G., Sáfrány, E., Rochlitz, R., & Bódizs, R. (2007). Kísérlet a felnőttkori kötődés mérésére – A Kapcsolati Kérdőív (Relationship Scale Questionnaire) magyar változata [An attempt to measure adult attachment – the Hungarian version of the Relationship Scale Questionnaire]. *Pszichológia, 27*(4), 333–355.

Dussault, M., Fernet, C., Austin, S., & Leroux, M. (2009). Revisiting the factorial validity of the Revised UCLA Loneliness Scale: A test of competing models in a sample of teachers. *Psychological Reports*, *105*(3), 849–856. https://doi.org/10.2466/PR0.105.3.849-856

Ernst, M., Niederer, D., Werner, A. M., Czaja, S. J., Mikton, C., Ong, A. D., Rosen, T., Brähler, E., & Beutel, M. E. (2022). Loneliness before and during the COVID-19 pandemic: A systematic review with meta-analysis. *The American Psychologist, 77*(5), 660–677. https://doi.org/10.1037/amp0001005

Franssen, T., Stijnen, M., Hamers, F., & Schneider, F. (2020). Age differences in demographic, social and health-related factors associated with loneliness across the adult life span (19–65 years): A cross-sectional study in the Netherlands. *BMC Public Health*, *20*(1), Article 1118. https://doi.org/10.1186/s12889-020-09208-0

Hartshorne, T. S. (1993). Psychometric properties and confirmatory factor analysis of the UCLA Loneliness Scale. *Journal of Personality Assessment, 61*(1), 182–195. https://doi.org/10.1207/s15327752jpa6101_14

Hawkley, L. C., Browne, M. W., & Cacioppo, J. T. (2005). How can I connect with thee? Let me count the ways. *Psychological Science*, *16*(10), 798–804. https://doi.org/10.1111/j.1467-9280.2005.01617.x

Hawkley, L. C., & Cacioppo, J. T. (2010). Loneliness matters: A theoretical and empirical review of consequences and mechanisms. *Annals of Behavioral Medicine: A publication of the Society of Behavioral Medicine*, *40*(2), 218–227. https://doi.org/10.1007/s12160-010-9210-8

Hu, L-T., & Bentler, P. M. (1999). Cutoff criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Jones, W. H., Carpenter, B. N., & Quintana, D. (1985). Personality and interpersonal predictors of loneliness in two cultures. *Journal of Personality and Social Psychology, 48*(6), 1503–1511. https://doi.org/10.1037/0022-3514.48.6.1503

Kline, R. B. (2011). *Principles and practice of structural equation modelling* (3rd ed.). Guilford Press.

Ladd, G. W., & Ettekal, I. (2013). Peer-related loneliness across early to late adolescence: Normative trends, intra-individual trajectories, and links with depressive symptoms. *Journal of Adolescence*, *36*(6), 1269–1282. https://doi.org/10.1016/j.adolescence.2013.05.004

Lasgaard, M., Friis, K., & Shevlin, M. (2016). "Where are all the lonely people?" A population-based study of high-risk groups across the life span. *Social Psychiatry and Psychiatric Epidemiology*, *51*(10), 1373–1384. https://doi.org/10.1007/s00127-016-1279-3

Lasgaard, M., Goossens, L., Bramsen, R. H., Trillingsgaard, T., & Elklit, A. (2011). Different sources of loneliness are associated with different forms of psychopathology in adolescence. *Journal of Research in Personality, 45*(2), 233–237. https://doi.org/10.1016/j.jrp.2010.12.005

Lee, Y., & Ko, Y. (2018). Feeling lonely when not socially isolated: Social isolation moderates the association between loneliness and daily social interaction. *Journal of Social and Personal Relationships, 35*(10), 1340–1355. https://doi.org/10.1177/0265407517712902

Lim, M. H., Eres, R., & Vasan, S. (2020). Understanding loneliness in the twenty-first century: an update on correlates, risk factors, and potential solutions. *Social Psychiatry and Psychiatric Epidemiology, 55*(7), 793–810. https://doi.org/10.1007/s00127-020-01889-7

Lyyra, N., Thorsteinsson, E. B., Eriksson, C., Madsen, K. R., Tolvanen, A., Löfstedt, P., & Välimaa, R. (2021). The association between loneliness, mental well-being, and self-esteem among adolescents in four Nordic countries. *International Journal of Environmental Research and Public Health*, *18*(14), Article 7405. https://doi.org/10.3390/ijerph18147405

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*(2), 130–149. https://doi.org/10.1037/1082-989X.1.2.130

Maes, M., Qualter, P., Vanhalst, J., Van den Noortgate, W., & Goossens, L. (2019). Gender differences in loneliness across the lifespan: A meta-analysis. *European Journal of Personality, 33*(6), 642–654. https://doi.org/10.1002/per.2220

Mahon, N. E., & Yarcheski, A. (1990). The dimensionality of the UCLA Loneliness Scale in early adolescents. *Research in Nursing & Health*, *13*(1), 45–52. https://doi.org/10.1002/nur.4770130108

Mahon, N. E., Yarcheski, T. J., & Yarcheski, A. (1995). Validation of the revised UCLA Loneliness Scale for adolescents. *Research in Nursing & Health*, *18*(3), 263–270. https://doi.org/10.1002/nur.4770180309

Matthews, T., Fisher, H. L., Bryan, B. T., Danese, A., Moffitt, T. E., Qualter, P., Verity, L., & Arseneault, L. (2022). This is what loneliness looks like: A mixed-methods study of loneliness in adolescence and young adulthood. *International Journal of Behavioral Development, 46*(1), 18–27. https://doi.org/10.1177/0165025420979357

McWhirter, B. T. (1990). Factor analysis of the Revised UCLA Loneliness Scale. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues, 9*(1), 56–68. https://doi.org/10.1007/BF02686768

Mund, M., & Neyer, F. J. (2019). Loneliness effects on personality. *International Journal of Behavioral Development, 43*(2), 136–146. https://doi.org/10.1177/0165025418800224

Nicolaisen, M., & Thorsen, K. (2014). Who are lonely? Loneliness in different age groups (18–81 years old), using two measures of loneliness. *International Journal of Aging & Human Development*, *78*(3), 229–257. https://doi.org/10.2190/AG.78.3.b

Peplau, L. A., & Perman, D. (1979). Blueprint for a social psychological theory of loneliness. In M. Cook & G. Wilson (Eds.), *Love and attraction: An international conference* (pp. 101–110). Oxford: Pergamon.

Peplau, L. A. (1985). Loneliness research: Basic concepts and findings. In I. G. Sarason & B. R. Sarason (Eds.), *Social support: Theory, research and applications* (pp. 269–286). NATO ASI Series, Vol 24. Springer, Dordrecht. https://doi.org/10.1007/978-94-009-5115-0_15

Perczel-Forintos, D., Sallai, J., & Rózsa, S. (2001). A Beck-féle Reménytelenség Skála pszichometriai vizsgálata [Psychometric properties of Beck Hopelessness Scale]. *Psychiatria Hungarica, 16*(6), 632–43.

Qualter, P., Vanhalst, J., Harris, R., Van Roekel, E., Lodder, G., Bangee, M., Maes, M., & Verhagen, M. (2015). Loneliness across the life span. *Perspectives on Psychological Science: A journal of the Association for Psychological Science*, *10*(2), 250–264. https://doi.org/10.1177/1745691615568999

Russell, D., Peplau, L. A., & Ferguson, M. L. (1978). Developing a measure of loneliness. *Journal of Personality Assessment*, *42*(3), 290–294. https://doi.org/10.1207/s15327752jpa4203_11

Russell, D., Peplau, L. A., & Cutrona, C. E. (1980). The revised UCLA Loneliness Scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology*, *39*(3), 472–480. https://doi.org/10.1037//0022-3514.39.3.472

Russell, D. (1982). The measurement of loneliness. In L. Peplau, & D. Perlman (Eds.), *Loneliness: A sourcebook of current theory, research and therapy* (pp.81–104). Wiley Interscience.

Russell D. W. (1996). UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment*, *66*(1), 20–40. https://doi.org/10.1207/s15327752jpa6601_2

Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *The Journal of Educational Research, 99*(6), 323–338. https://doi.org/10.3200/JOER.99.6.323-338

Sisenwein, R. J. (1964). *Loneliness and the individual as viewed by himself and others* (Publication No. 6504768) [Doctoral dissertation, Columbia University, Teachers Collage]. ProQuest Dissertations Publishing.

Spithoven, A. W. M., Bijttebier, P., & Goossens, L. (2017). It is all in their mind: A review on information processing bias in lonely individuals. *Clinical Psychology Review*, *58*, 97–114. https://doi.org/10.1016/j.cpr.2017.10.003

Surkalim, D. L., Luo, M., Eres, R., Gebel, K., van Buskirk, J., Bauman, A., & Ding, D. (2022). The prevalence of loneliness across 113 countries: Systematic review and meta-analysis. *BMJ, 376,* Article e067068. https://doi.org/10.1136/bmj-2021-067068

Vanhalst, J., Goossens, L., Luyckx, K., Scholte, R. H., & Engels, R. C. (2013). The development of loneliness from mid- to late adolescence: Trajectory classes, personality traits, and psychosocial functioning. *Journal of Adolescence*, *36*(6), 1305–1312. https://doi.org/10.1016/j.adolescence.2012.04.002

van Roekel, E., Goossens, L., Verhagen, M., Wouters, S., Engels, R. C. M. E., & Scholte, R. H. J. (2013). Loneliness, affect, and adolescents' appraisals of company: An experience sampling method (ESM) study. *Journal of Research on Adolescence, 24*(2)*,* 350–363. https://doi.org/10.1111/jora.12061

van Roekel, E., Verhagen, M., Engels, R. C. M. E., Scholte, R. H. J., Cacioppo, S., & Cacioppo, J. T. (2018). Trait and state levels of loneliness in early and late adolescents: Examining the differential reactivity hypothesis. *Journal of Clinical Child and Adolescent Psychology, 47*(6), 888–899. https://doi.org/10.1080/15374416.2016.1146993

Wilson, D., Cutts, J., Lees, I., Mapungwana, S., & Maunganidze, L. (1992). Psychometric properties of the revised UCLA Loneliness Scale and two short-form measures of loneliness in Zimbabwe. *Journal of Personality Assessment*, *59*(1), 72–81. https://doi.org/10.1207/s15327752jpa5901_7

Wongpakaran, N., Wongpakaran, T., Pinyopornpanish, M., Simcharoen, S., Suradom, C., Varnado, P., & Kuntawong, P. (2020). Development and validation of a 6-item Revised UCLA Loneliness Scale (RULS-6) using Rasch analysis. *British Journal of Health Psychology*, *25*(2), 233–256. https://doi.org/10.1111/bjhp.12404

Yang, K., & Victor, C. (2011). Age and loneliness in 25 European nations. *Ageing & Society, 31*(8), 1368–1388. https://doi.org/10.1017/S0144686X1000139X

Supplementary tables

Supplementary Table 1. Frequency distribution UCLA-LS scale scores

UCLA-LS total score	Frequency	Percent	Cumulative Percent	UCLA-LS total score	Frequency	Percent	Cumulative Percent
20	6	.24	.24	47	47	1.87	82.97
21	6	.24	.48	48	39	1.56	84.53
22	26	1.04	1.52	49	49	1.95	86.48
23	30	1.20	2.71	50	69	2.75	89.23
24	55	2.19	4.90	51	34	1.36	90.59
25	69	2.75	7.66	52	33	1.32	91.91
26	94	3.75	11.40	53	35	1.40	93.30
27	98	3.91	15.31	54	17	.68	93.98
28	88	3.51	18.82	55	19	.76	94.74
29	136	5.42	24.24	56	15	.60	95.33
30	117	4.67	28.91	57	19	.76	96.09
31	145	5.78	34.69	58	12	.48	96.57
32	109	4.35	39.04	59	8	.32	96.89
33	105	4.19	43.22	60	15	.60	97.49
34	94	3.75	46.97	61	14	.56	98.05
35	88	3.51	50.48	62	8	.32	98.37
36	76	3.03	53.51	63	8	.32	98.68
37	103	4.11	57.62	64	3	.12	98.80
38	89	3.55	61.16	65	9	.36	99.16
39	79	3.15	64.31	66	5	.20	99.36
40	74	2.95	67.26	67	4	.16	99.52
41	73	2.91	70.18	68	4	.16	99.68
42	67	2.67	72.85	69	2	.08	99.76
43	57	2.27	75.12	70	1	.04	99.80
44	62	2.47	77.59	71	2	.08	99.88
45	40	1.59	79.19	72	2	.08	99.96
46	48	1.91	81.10	77	1	.04	100.00

Supplementary Table 2. Total-item and inter-item Pearson's correlations of UCLA-LS

	UCLA-LS total	UCLA-LS items																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	.65 (<.001)	1																		
2	.12 (<.001)	-.07 (.001)	1																	
3	.64 (<.001)	.33 (<.001)	.19 (<.001)	1																
4	.25 (<.001)	.12 (<.001)	-.02 (.232)	.07 (<.001)	1															
5	.61 (<.001)	.45 (<.001)	-.06 (.002)	.29 (<.001)	.16 (<.001)	1														
6	.65 (<.001)	.53 (<.001)	-.05 (.013)	.31 (<.001)	.12 (<.001)	.51 (<.001)	1													
7	.53 (<.001)	.28 (<.001)	.04 (.041)	.39 (<.001)	.14 (<.001)	.27 (<.001)	.25 (<.001)	1												
8	.39 (<.001)	.20 (<.001)	.03 (.097)	.24 (<.001)	-.01 (.530)	.14 (<.001)	.25 (<.001)	.22 (<.001)	1											
9	.52 (<.001)	.45 (<.001)	-.20 (<.001)	.18 (<.001)	.07 (.001)	.38 (<.001)	.44 (<.001)	.21 (<.001)	.15 (<.001)	1										
10	.59 (<.001)	.44 (<.001)	-.16 (<.001)	.29 (<.001)	.14 (<.001)	.42 (<.001)	.42 (<.001)	.26 (<.001)	.13 (<.001)	.40 (<.001)	1									
11	.65 (<.001)	.33 (<.001)	.15 (<.001)	.46 (<.001)	.04 (.029)	.29 (<.001)	.32 (<.001)	.32 (<.001)	.26 (<.001)	.21 (<.001)	.24 (<.001)	1								
12	.55 (<.001)	.28 (<.001)	.06 (.003)	.33 (<.001)	.03 (.119)	.28 (<.001)	.26 (<.001)	.29 (<.001)	.23 (<.001)	.19 (<.001)	.23 (<.001)	.43 (<.001)	1							
13	.61 (<.001)	.28 (<.001)	.07 (.001)	.40 (<.001)	.07 (.001)	.27 (<.001)	.33 (<.001)	.39 (<.001)	.27 (<.001)	.26 (<.001)	.25 (<.001)	.42 (<.001)	.38 (<.001)	1						
14	.71 (<.001)	.38 (<.001)	.14 (<.001)	.45 (<.001)	.03 (.120)	.34 (<.001)	.35 (<.001)	.35 (<.001)	.26 (<.001)	.32 (<.001)	.28 (<.001)	.57 (<.001)	.44 (<.001)	.48 (<.001)	1					
15	.48 (<.001)	.34 (<.001)	.06 (.004)	.20 (<.001)	.06 (.002)	.32 (<.001)	.33 (<.001)	.11 (<.001)	.09 (<.001)	.35 (<.001)	.28 (<.001)	.27 (<.001)	.12 (<.001)	.15 (<.001)	.28 (<.001)	1				
16	.64 (<.001)	.42 (<.001)	-.12 (<.001)	.35 (<.001)	.15 (<.001)	.40 (<.001)	.44 (<.001)	.28 (<.001)	.14 (<.001)	.37 (<.001)	.56 (<.001)	.29 (<.001)	.28 (<.001)	.38 (<.001)	.34 (<.001)	.28 (<.001)	1			
17	.55 (<.001)	.26 (<.001)	.24 (<.001)	.40 (<.001)	.05 (.022)	.21 (<.001)	.21 (<.001)	.24 (<.001)	.16 (<.001)	.10 (<.001)	.18 (<.001)	.44 (<.001)	.28 (<.001)	.31 (<.001)	.49 (<.001)	.20 (<.001)	.23 (<.001)	1		
18	.68 (<.001)	.38 (<.001)	.12 (<.001)	.44 (<.001)	.07 (<.001)	.32 (<.001)	.36 (<.001)	.34 (<.001)	.28 (<.001)	.25 (<.001)	.29 (<.001)	.52 (<.001)	.42 (<.001)	.45 (<.001)	.56 (<.001)	.24 (<.001)	.31 (<.001)	.48 (<.001)	1	
19	.59 (<.001)	.45 (<.001)	-.14 (<.001)	.31 (<.001)	.16 (<.001)	.43 (<.001)	.41 (<.001)	.23 (<.001)	.09 (<.001)	.35 (<.001)	.60 (<.001)	.26 (<.001)	.21 (<.001)	.22 (<.001)	.29 (<.001)	.30 (<.001)	.55 (<.001)	.24 (<.001)	.28 (<.001)	1
20	.65 (<.001)	.44 (<.001)	-.13 (<.001)	.40 (<.001)	.15 (<.001)	.42 (<.001)	.43 (<.001)	.28 (<.001)	.14 (<.001)	.38 (<.001)	.60 (<.001)	.31 (<.001)	.25 (<.001)	.29 (<.001)	.32 (<.001)	.29 (<.001)	.62 (<.001)	.26 (<.001)	.34 (<.001)	.73 (<.001)

Supplementary Table 3. Association between the single-item measure of loneliness *("I feel lonely")* and gender as well as age

	"I feel lonely", *n* (%)			χ^2	*p*	*V*
	Sometimes	Quite often	Very often			
females (*n* = 1436)	1208 (84.1)	156 (10.9)	72 (5.0)	10.73	.005	.07
males (*n* = 1072)	949 (88.5)	78 (7.3)	45 (4.2)			
14–17 yrs (*n* = 1413)	934 (85.3)	113 (10.3)	48 (4.4)	2.48	.289	.03
18–21 yrs (*n* = 1095)	1223 (86.6)	121 (8.6)	69 (4.9)			

Note. V: Cramer's V.

Supplementary Table 4. Gender and age differences in hopelessness, the number of close friends and self-reported well-being

	Females (*n* = 1436)		Males (*n* = 1072)		*t*	*p*	*g*
	M	*SD*	*M*	*SD*			
Number of close friends	2.53	0.78	2.65	0.99	-3.20	.001	.14
Hopelessness	6.14	3.48	5.68	3.22	3.42	.001	.14
Self-reported well-being	3.40	0.86	3.63	0.74	-7.14	< .001	.28
	14–17 yrs (*n* = 1413)		18–21 yrs (*n* = 1095)		*t*	*p*	*g*
	M	*SD*	*M*	*SD*			
Number of close friends	2.56	0.79	2.59	0.94	-0.77	.443	.03
Hopelessness	6.15	3.43	5.79	3.32	2.61	.009	.11
Self-reported well-being	3.44	0.84	3.54	0.80	-3.11	.002	.12

Note. g: Hedges' g.

Supplementary Table 5. Correlation coefficients between UCLA-LS items and single-item measure of loneliness, hopelessness, the number of close friends, self-reported well-being

		UCLA-LS1	UCLA-LS2	UCLA-LS3	UCLA-LS4	UCLA-LS5	UCLA-LS6	UCLA-LS7	UCLA-LS8	UCLA-LS9	UCLA-LS10[a]
Single-item measure of loneliness	*rho*	.25**	*.17***	.35**	*.12***	.21**	.24**	.23**	*.12***	*.11***	.21**
	p	<.001	*<.001*	<.001	*<.001*	<.001	<.001	<.001	*<.001*	*<.001*	<.001
Hopelessness	*rho*	.33**	*.08***	.33**	*.12***	.28**	.28**	.28**	*.13***	.25**	.25**
	p	<.001	*<.001*	<.001	*<.001*	<.001	<.001	<.001	*<.001*	<.001	<.001
Number of close friends	*rho*	-.24**	*.04**	*-.18***	-.01	-.33**	-.25**	*-.17***	*-.13***	-.25**	-.25**
	p	<.001	*.043*	*<.001*	.602	<.001	<.001	*<.001*	*<.001*	<.001	<.001
Self-reported well-being	*rho*	-.34**	*-.16***	-.38**	*-.09***	-.28**	-.28**	-.28**	*-.16***	*-.20***	-.22**
	p	<.001	*<.001*	<.001	*<.001*	<.001	<.001	<.001	*<.001*	*<.001*	<.001
		UCLA-LS11[a]	UCLA-LS12[a]	UCLA-LS13[a]	UCLA-LS14[a]	UCLA-LS15	UCLA-LS16[a]	UCLA-LS17[a]	UCLA-LS18[a]	UCLA-LS19[a]	UCLA-LS20[a]
Single-item measure of loneliness	*rho*	.34**	*.19***	.25**	.34**	*.20***	.22**	.39**	.33**	.25**	.25**
	p	<.001	*<.001*	<.001	<.001	*<.001*	<.001	<.001	<.001	<.001	<.001
Hopelessness	*rho*	.33**	.20**	.28**	.32**	.24**	.28**	.31**	.32**	.28**	.29**
	p	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
Number of close friends	*rho*	-.21**	-.21**	*-.19***	-0.24**	-.20**	-.21**	*-.15***	-.24**	-.22**	-.22**
	p	<0.001	<.001	*<.001*	<.001	<.001	<.001	*<.001*	<.001	<.001	<.001
Self-reported well-being	*rho*	-.39**	-.24**	-.33**	-0.43**	-.23**	-.26**	-.44**	-.40**	-.25**	-.29**
	p	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001

Notes. rho: Spearman's rank order correlation coefficients. * Correlation is significant at .05 level (2-tailed). ** Correlation is significant at .01 level (2-tailed). Significant but small correlations are in italics. [a] Items in the two-factor model of the Hungarian UCLA-LS.

Supplementary Table 6. Testing and comparing the two- and three-factor models of Hungarian UCLA-LS

Models	**Two-factor model**		Austin [37]			Adams et al. [36]			McWhirter [39]			Wilson et al. [2]		Mahon et al. [35]		Dussault et al. [38]			Boffo et al. [33]		
Factors/ Items	SI	SC	IO	SO	BA	PL	PSL	SL	IO	SO	AE	IO	SO	IO	SO	I	RC	CC	I	RC	TL
1(R)					*						*		*	*	*			*			
2			x				x		x			x			x	x			x		
3			x						x			x		x	x	x					
4(R)					*						*	*		*	*			*	*		
5(R)					*						*		*	*				*		*	
6(R)					*						*		*	*				*			
7			x			x			x			x		x	x	x					
8			x			x			x			x			x	x					
9					x						x		x	x				x			x
10(R)		*		*			*			*			*	*			*				*
11	x		x					x	x			x			x	x			x		
12	x		x			x			x			x			x	x				x	
13	x		x			x			x			x			x	x					
14	x		x			x		x	x			x			x	x			x		
15(R)				*			*				*		*	*	*		*				
16(R)		*		*			*			*		x		*			*			*	
17	x		x					x	x			x			x	x					x
18	x		x			x			x			x			x	x					
19(R)		*		*			*			*			*	*			*				
20(R)		*		*			*			*			*	*			*			*	
AIC	26808		54710			37008			57483			58350		57815		57571			33063		
BIC	26968		55029			37235			57808			58663		58150		57895			33248		
CFI	.97		.92			.94			.92			.83		.89		.91			.79		
TLI	.96		.91			.93			.91			.81		.87		.90			.72		

Notes. SI: social isolation, SC: social connectedness, IO: intimate others, SO: social others, BA: belonging and affiliation, PL: psychological loneliness, PSL: psychosocial loneliness, SL: social loneliness, AE: affiliative environment, I: isolation, RC: relational connectedness, CC: collective connectedness, TL: trait loneliness, * (R): reversed items.