Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Population prevalence of mental disorders in Slovakia: a nationwide cross-sectional study

Alexandra Bražinová

alexandra.brazinova@fmed.uniba.sk

Comenius University Bratislava

Michal Hajdúk

Comenius University Bratislava

Marek Majdan

Trnava University

Mária Kráľová

Comenius University Bratislava

Article

Keywords: Mental Disorders, Epidemiology, Prevalence, Slovakia, Adult Population, Public Health

Posted Date: November 24th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11270404/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Title: Population prevalence of mental disorders in Slovakia: a nationwide cross-sectional study

Authors:

Bražinová Alexandra[1], Hajdúk Michal[2], Majdan Marek[3], Kráľová Mária[4]

Affiliations:

[1] Institute of Epidemiology, Faculty of Medicine, Comenius University Bratislava, Slovakia
[2] Department of Psychology, Faculty of Arts, Comenius University Bratislava, Slovakia
[3] Department of Public Health, Faculty of Health Care and Social Work, Trnava University, Slovakia
[4] Department of Psychiatry, Faculty of Medicine, Comenius University Bratislava, Slovakia

Corresponding author:

Prof. Alexandra Bražinová, MD, PhD
Institute of Epidemiology,
Faculty of Medicine, Comenius University Bratislava
Moskovská 3, 81108 Bratislava
Slovakia
alexandra.brazinova@fmed.uniba.sk

Declarations

Funding statement

The study was funded through the Recovery and Resilience Plan and carried out at the initiative of the Ministry of Health of the Slovak Republic.

Conflict of interests
The authors declare that they have no conflict of interest.

Ethics approval
The study was approved by the Ethics Committee of the Ministry of Health of the Slovak Republic on November 15, 2023, under reference number Z091007-2023, and conducted in accordance with the study protocol (Protocol number: ClinicalTrials.gov: NCT07129408). The M.I.N.I. is a licensed instrument, and its use in this study was authorized by the license holder.

Consent to participate
Written informed consent was obtained from all individual participants included in the study.

Availability of data and material
The dataset used for analyses in this study is deposited in Zenodo (https://doi.org/10.5281/zenodo.23805394). The Mini International Neuropsychiatric Interview is copyright of its author and licensed per administration and is available to researchers under licence from the copyright holder. The dataset is also available on reasonable request from the corresponding author.

Clinical Trial Registration
The study has been registered at ClinicalTrials.gov, ID: NCT07129408.

Abstract:

Mental disorders are among the leading causes of ill health and disability worldwide, yet reliable population data remain scarce across much of Central and Eastern Europe. In Slovakia, earlier surveys date back about two decades, each covered a single group of disorders, and none used a structured diagnostic interview. This study provides the first estimates of common mental disorders among Slovak adults based on such an interview and examines how these disorders are distributed across social and demographic groups. A nationally representative sample of 3,100 adults, selected by multistage random sampling, was interviewed face to face between March and June 2025 using the Mini International Neuropsychiatric Interview, a standardised instrument that identifies mood, anxiety and alcohol use disorders according to international diagnostic criteria. Multivariable logistic regression was used to identify characteristics independently associated with having any disorder. Overall, 18.6% of adults met criteria for at least one mental disorder. Mood disorders affected 9.4% of respondents, alcohol use disorders 8.4% and anxiety disorders 4.2%. Patterns differed sharply by sex: alcohol use disorders occurred almost exclusively among men (16.2% vs 1.5% of women), whereas anxiety disorders were more common among women, so that overall prevalence was higher in men (23.4% vs 14.2%). Chronic physical illness (odds ratio 2.88), unemployment (2.26), male sex (2.14) and previous COVID-19 infection (1.53) were each independently associated with higher odds of a mental disorder, as was large-city residence (1.53), whereas adults aged 60 years and over had lower odds (0.56). Mental disorders therefore represent a substantial burden in Slovakia, shaped by gendered drinking norms and by social and economic circumstances such as unemployment and chronic illness. The findings support integrating mental health care into chronic disease management, alcohol policies that reach men, and national strategies that address the social determinants of mental health.

Keywords: Mental Disorders, Epidemiology, Prevalence, Slovakia, Adult Population, Public Health

Introduction

Mental disorders are a global public health and societal problem of growing significance. According to the latest Global Burden of Disease (GBD) study, mental disorders ranked as the 5th leading cause of health loss in 2023 (up from 12th in 1990), affecting approximately 15% of the world's population—nearly 1.2 billion people—with substantial variation across world regions (Collaborators 2022, WHO 2025, IHME 2026). In the European Union (EU), an estimated 75 million people were affected as of 2023 (17% of the total population), accounting for over 7% of all disability-adjusted life-years (DALYs, a measure of overall disease burden) (Network 2024) and producing significant regional, social, gender, and age inequalities. The associated economic burden exceeds €600 billion annually—more than 4% of EU GDP (Union 2024). Thus, the toll of mental disorders at the individual, societal, and public-health level is substantial.

Most mental disorders begin early in life: approximately 50% have onset by age 18 and 75% by age 25, with median age of onset around 19 years in males and 20 years in females, potentially causing prolonged suffering if left undiagnosed and untreated (Solmi, Radua et al. 2022, McGrath, Al-Hamzawi et al. 2023, Uhlhaas, Davey et al. 2023). Early detection is often delayed by low public awareness, limited healthcare access, and persistent stigma, all of which significantly hinder timely recognition and treatment (Lewandowska, Silczuk et al. 2025, Mikesell, Blevins et al. 2025). Living with an untreated mental disorder is strongly associated with reduced social and vocational functioning, disability, and premature mortality—making up-to-date epidemiological data on both treated and untreated mental disorders across populations essential. Large-scale meta-analyses and cohort studies consistently show that individuals with mental disorders have substantially shorter life expectancy than the general population, with median years of potential life lost estimated at 10–15 years, and greater losses for some specific conditions (Chesney, Goodwin et al. 2014, Walker, McGee et al. 2015, Hjorthoj, Sturup et al. 2017).

Addressing the growing public health burden of mental disorders requires evidence-based strategies that prioritize early detection, close gaps in treatment and service availability, and strengthen prevention where possible. Planning and implementing such strategies depend on current, reliable data on the prevalence of mental disorders and their distribution across population subgroups. While GBD estimates provide a useful overview of overall burden and trends, they rely largely on modelling based on published studies and administrative health datasets and may not capture population-level specifics across regions and countries. Purpose-designed, methodologically sound epidemiological studies using validated instruments are therefore essential for detailed assessment.

While several studies have analyzed the prevalence of mental disorders in Europe (Alonso, Angermeyer et al. 2004, Goodwin, Faravelli et al. 2005, Lieb, Becker et al. 2005, Paykel, Brugha et al. 2005, Pini, de Queiroz et al. 2005, Rehm, Room et al. 2005), reliable epidemiological data remain scarce across much of Central and Eastern Europe, including Slovakia. Previous Slovak studies focused primarily on depression and anxiety disorders (Heretik 2003, V. Novotný 2006, Heretik A. jr. 2008) , were conducted approximately 20 years ago, and did not apply validated diagnostic instruments capable of assessing multiple disorders simultaneously at the population level. Beyond study design, the instruments used to detect specific disorders are a key component of robust epidemiological studies—they support generalizability and comparability of results across populations and over time.

The World Mental Health (WMH) Survey Initiative, launched by the World Health Organization (WHO) in the 1990s, was designed to generate internationally comparable prevalence estimates of mental disorders. To support this aim, the WMH Composite International Diagnostic Interview (WMH-CIDI), a structured diagnostic instrument, was developed and has since been administered in population surveys in more than 30 countries (McGrath, Al-Hamzawi et al. 2023). To improve feasibility in large-scale studies, shorter diagnostic instruments were subsequently developed, the most widely adopted being the Mini International Neuropsychiatric Interview (M.I.N.I.) (Sheehan, Lecrubier et al. 1998). Validation studies have shown that the M.I.N.I. achieves diagnostic accuracy comparable to the CIDI while requiring substantially less administration time (Amorim, Lecrubier et al. 1998). Both instruments can be administered by lay interviewers following standardized training, and the M.I.N.I. has been deployed in population studies in a wide range of countries

(Qureshi, Collazos et al. 2013, Winkler, Formanek et al. 2018, Gerdner and Hakansson 2022, Vinogradova, Kivite-Urtane et al. 2022, Silvestri, Carpita et al. 2023), establishing its validity and utility for population-level epidemiological research on mental disorders.

To address the data gap in Slovakia and inform prevention, early detection, and mental healthcare planning, we conducted the first large-scale, population-based epidemiological study of common mental disorders in Slovak adults, using a comprehensive diagnostic instrument. The study aimed to estimate the prevalence of common mental disorders and to characterize their distribution across key demographic and social subgroups.

Methods

Study Design and Population

A population level cross-sectional epidemiological study was conducted on a nationally representative sample of 3,100 adults, selected using a multistage random sampling procedure stratified by age, sex and region of residence. The sample size was calculated to ensure generalizability to the national adult population with a 95% confidence level and a margin of error of approximately 2%. The study was implemented in accordance with the previously published study protocol (Protocol number: ClinicalTrials.gov: NCT07129408) (Bražinová Alexandra 2026).

Inclusion and Exclusion Criteria

Eligible respondents were aged 18 years or older and able and willing to complete a demographic questionnaire, participate in a structured interview, complete standardized instruments in a face-to-face setting, and provide written informed consent. Individuals younger than 18 years or absent from the approached household at the time of sampling, were excluded.

Sampling Procedure

In the first stage, primary sampling units (PSUs)—towns and villages—were stratified by region and settlement size and selected using probability proportional to size (PPS) sampling based on the number of adult residents, yielding 300 PSUs. In the second stage, secondary sampling units (SSUs)—streets—were selected within each PSU. On each street, a starting point was assigned, and households were selected by random walk. One adult per household was then selected using the Kish method (Smith, Chey et al. 1995). Households were classified as "unavailable" only after a minimum of three unsuccessful contact attempts.

Data Collection

Data were collected through face-to-face interviews using Computer-Aided Personal Interviewing (CAPI) or Tablet-Aided Personal Interviewing (TAPI). Data collection was outsourced to a professional population research agency and overseen at each stage by an expert panel in mental health and epidemiology.

Interviewers were recruited by the research agency and trained in terminology, interviewing techniques, fieldwork procedures, and legal and ethical considerations. Specialized training on the full protocol (M.I.N.I., demographic and health questionnaire) was delivered by a psychologist and a psychiatrist who routinely use the M.I.N.I. in clinical practice, following the guidelines issued by the instrument's licensors. Interviewers carried official authorization letters and ID cards, and each respondent received written information on available mental health support services. Each interviewer conducted no more than 50 interviews.

Data collection began with a pilot phase of 100 respondents. The expert panel then reviewed the findings, incorporated interviewer feedback, and verified the completeness and validity of the dataset. No significant issues emerged, and procedures were kept unchanged for the main phase; the 100 pilot respondents were therefore retained in the final sample. The pilot was completed on March 5, 2025, and the main data collection ran from March 10 to June 27, 2025.

Data were collected using the official Slovak translation of the seventh version of the M.I.N.I., complemented by a structured demographic and health questionnaire. The questionnaire captured participant characteristics including age, sex, marital status, education, employment, region of residence, nationality, family composition, chronic health conditions, self-rated health, quality of life, history of COVID-19 infection, and use of healthcare services.

The M.I.N.I. is a standardized diagnostic instrument that assesses mental disorders according to DSM-5 and ICD-10 criteria. Each disorder is evaluated through a dedicated module, and respondents are classified as

having the disorder when symptom criteria are met. In this study, modules were administered to assess the lifetime prevalence of depressive episodes and bipolar disorder, and current episodes of depressive disorder, bipolar disorder, panic disorder, generalized anxiety disorder, agoraphobia, social phobia, obsessive-compulsive disorder, post-traumatic stress disorder, and alcohol abuse.

Variable definition

The presence of each disorder was determined by applying the M.I.N.I.'s pre-defined diagnostic algorithms to responses across its structured battery of questions. Prevalence was calculated as the number of detected cases divided by the total sample (n=3,100) or by the corresponding subgroup size, expressed as a percentage. Diagnostic timeframes follow the M.I.N.I.: current major depressive episode and current (hypo)manic episode refer to the past two weeks; panic disorder, social phobia, OCD, and PTSD to the past month; generalized anxiety disorder to the past six months; alcohol use disorders to the past 12 months; agoraphobia is assessed as currently present; lifetime estimates cover any episode meeting criteria over the respondent's lifetime.

Statistical Analyses

Frequencies and proportions with 95% confidence intervals (CI) were used as the primary descriptive measures for the socio-demographic and general health characteristics of respondents. Prevalence estimates are presented as percentages of the total sample with 95% CI. Multivariable logistic regression was used to examine associations between respondent characteristics (demographic, social, and health-related) and the presence of mental disorders, with odds ratios (ORs) and 95% CIs reported. A p-value < 0.05 was considered statistically significant. All analyses were conducted in R version 4.4.3 (Team 2025).

Results

Sample characteristics

A total of 3,100 respondents were recruited and interviewed; their characteristics are summarized in Table 1. Women slightly outnumbered men (53% vs. 47%), and the most common age group was 35–59 years (46%). Nearly half of participants resided in rural areas (45%), and just over two-thirds had completed secondary education or reported middle to upper-middle income (both 69%). The majority were married or in a partnership (58%) and employed or self-employed (59%). Almost half were being treated for a chronic condition (45%), most of whom were managing more than one (54%).

Table 1: Demographic and social characteristics of the sample of respondents (n=3,100)

Characteristic	Category	n	%
Sex	Male	1,464	47%
	Female	1,636	53%
Age	18–34 years	564	18%
	35-59 years	1,413	46%
	60 or more years	1,123	36%
Residence type	Small city	1,008	33%
	Large City	702	23%
	Rural	1,390	45%
Attained Education	Middle	2,142	69%
	Higher	812	26%
	Elementary	146	5%
Income Group	Lower middle/low	941	30%
	middle/upper middle	2,135	69%
	High	24	1%
Marital Status	Widowed	350	11%
	Divorced	386	12%
	Single	573	18%
	Married/partnership	1,791	58%
Employment Status	Parental leave/retired	1,065	34%
	Unemployed	98	3%
	Employed/entrepreneur	1,814	59%
	Student	123	4%
Household Size	Single	564	18%
	Family (2-4 members)	2,252	73%
	Family (5+ members)	284	9%
Treated for Chronic Disease	No	1,703	55%
	Yes	1,397	45%
Number of Chronic Diseases	One	1,104	36%
	More than one	633	20%
	None	1,363	44%
COVID-19 infection	No	1,309	42%
	Yes	1,791	58%

Prevalence of mental disorders

The overall prevalence of any mental disorder in the adult Slovak population was 18.6% (95% CI: 17.2–20.0), with a significantly higher proportion of cases among males than females (60% vs. 40%, p<0.001). Mood disorders were the most prevalent category, affecting 9.4% of the sample (95% CI: 8.4–10.4), with no significant sex difference. Within this category, major depressive episode (MDE) was the most common, with a lifetime prevalence of 7.4% and a current-episode prevalence of 2.6%. Hypomanic and manic episodes were less common, both as lifetime and current episodes.

Anxiety disorders were present in 4.2% of the sample (95% CI: 3.5–5.0) and were significantly more prevalent among females (72% of cases, p<0.001). Within this category, agoraphobia was the most common (1.7%), with a pronounced female predominance (85%, p<0.001). Panic disorder (1.3%), OCD (1.2%), social phobia (0.6%), PTSD (0.55%), and GAD (0.42%) were each present in less than 2% of the population, with no significant sex differences.

Alcohol use disorders (AUD) were the second most prevalent category, affecting 8.4% of respondents (95% CI: 7.5–9.5), with a substantial sex disparity (91% of cases occurring among males, p<0.001). This pattern held consistently across all severity levels. Details are presented in Table 2.

Table 2: Prevalence of mental disorders in a nationally representative sample of the adult Slovak population in 2025

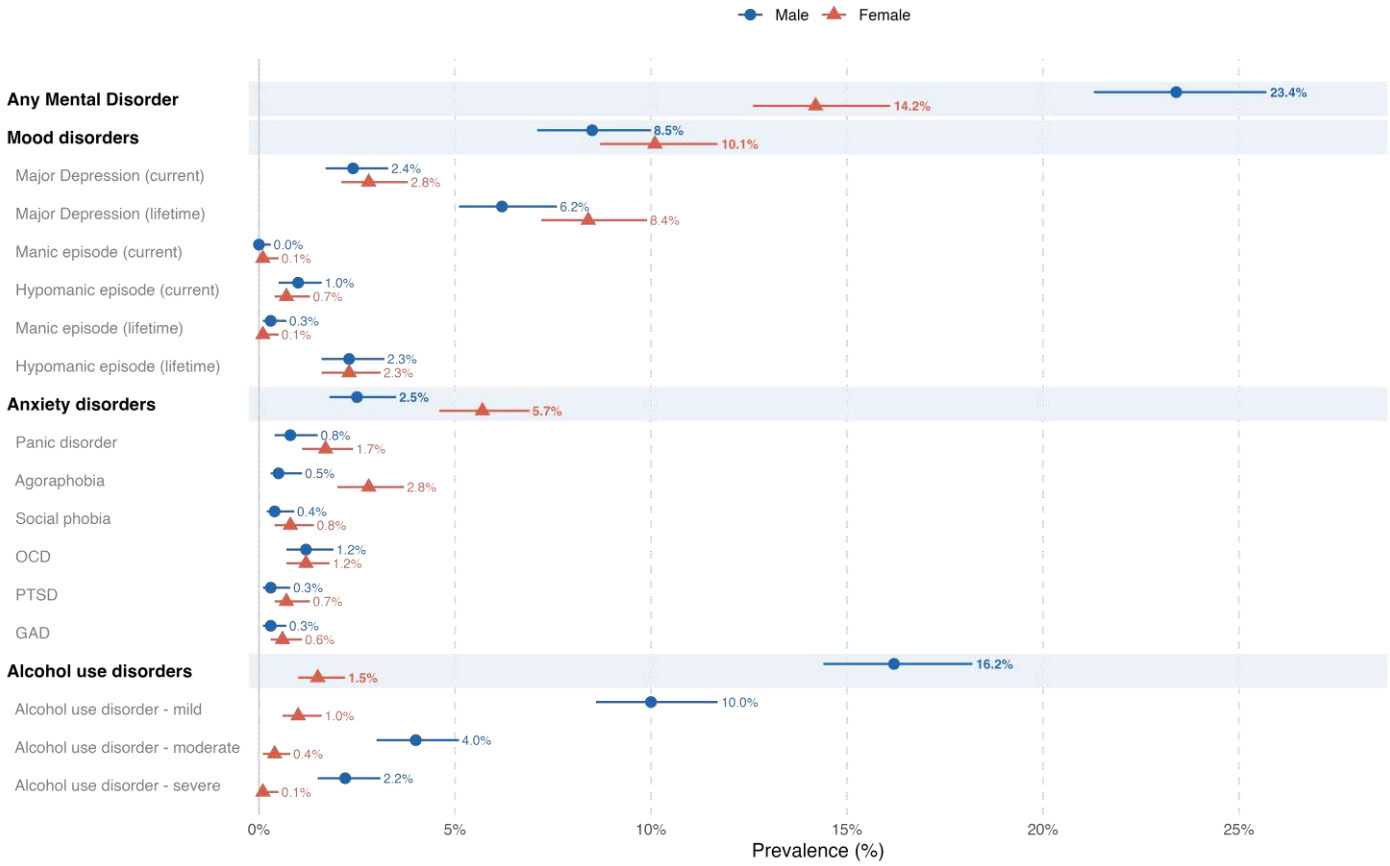
Disorder	Number of cases	Prevalence (%)	95% CI	% Males	p-value
Any mental disorder	**576**	**18.6**	**17.2–20.0**	**60%**	**<0.001**
Mood disorders	**290**	**9.4**	**8.4–10.4**	**43%**	**0.124**
Major depressive episode (current)	81	2.6	2.1–3.3	43%	0.535
Major depressive episode (lifetime)	229	7.4	6.5–8.4	40%	0.022
Manic episode (current)	2	0.06	0–0.3	0%	0.529
Hypomanic episode (current)	26	0.8	0.6–1.2	54%	0.630
Manic episode (lifetime)	6	0.2	0.1–0.4	67%	0.585
Hypomanic episode (lifetime)	70	2.3	1.8–2.9	47%	1.000
Anxiety disorders	**130**	**4.2**	**3.5–5.0**	**28%**	**<0.001**
Panic disorder	39	1.3	0.9–1.7	31%	0.056
Agoraphobia	53	1.7	1.3–2.2	15%	<0.001
Social phobia	19	0.6	0.4–1.0	32%	0.254
Obsessive-compulsive disorder	36	1.2	0.8–1.6	47%	1.000
Post-traumatic stress disorder	17	0.55	0.3–0.9	29%	0.218
Generalized anxiety disorder	13	0.42	0.2–0.7	31%	0.361
Alcohol use disorders	**261**	**8.4**	**7.5–9.5**	**91%**	**<0.001**
Alcohol use disorder, mild	163	5.3	4.5–6.1	90%	<0.001
Alcohol use disorder, moderate	64	2.1	1.6–2.6	91%	<0.001
Alcohol use disorder, severe	34	1.1	0.8–1.5	94%	<0.001

Unless otherwise specified, prevalence estimates reflect current cases per the M.I.N.I.'s disorder-specific timeframes (see Methods).

Sex-specific prevalences for each disorder category and individual disorder are shown in Figure 1. Several distinct patterns emerged. AUD showed the most pronounced male predominance (16.2% in males vs. 1.5% in females), consistent across all three severity levels (10%, 4%, and 2.2% in males for mild, moderate, and severe AUD, respectively, vs. <1% in females in each case). Anxiety disorders showed the opposite pattern, with a clear female predominance (5.7% vs. 2.5%), most pronounced for agoraphobia. Mood disorders had a more balanced overall distribution (8.5% in males vs. 10.1% in females); within this category, lifetime MDE was more prevalent in females (8.4%) than males (6.2%), while current MDE was comparable across sexes

(2.4% vs. 2.8%). Overall, any mental disorder was substantially more prevalent in males (23.4%) than females (14.2%), driven largely by the higher burden of AUD in men.

Figure 1: Prevalence of mental disorders in a nationally representative sample of the adult Slovak population in 2025



Points represent prevalence (%) in males (blue circles) and females (red triangles); horizontal lines indicate 95% confidence intervals. Grouped disorder categories are shown in bold with shaded bands. Unless otherwise specified, prevalence estimates reflect current cases per the M.I.N.I.'s disorder-specific timeframes (see Methods).
AUD = alcohol use disorder; GAD = generalized anxiety disorder; OCD = obsessive-compulsive disorder; PTSD = post-traumatic stress disorder.

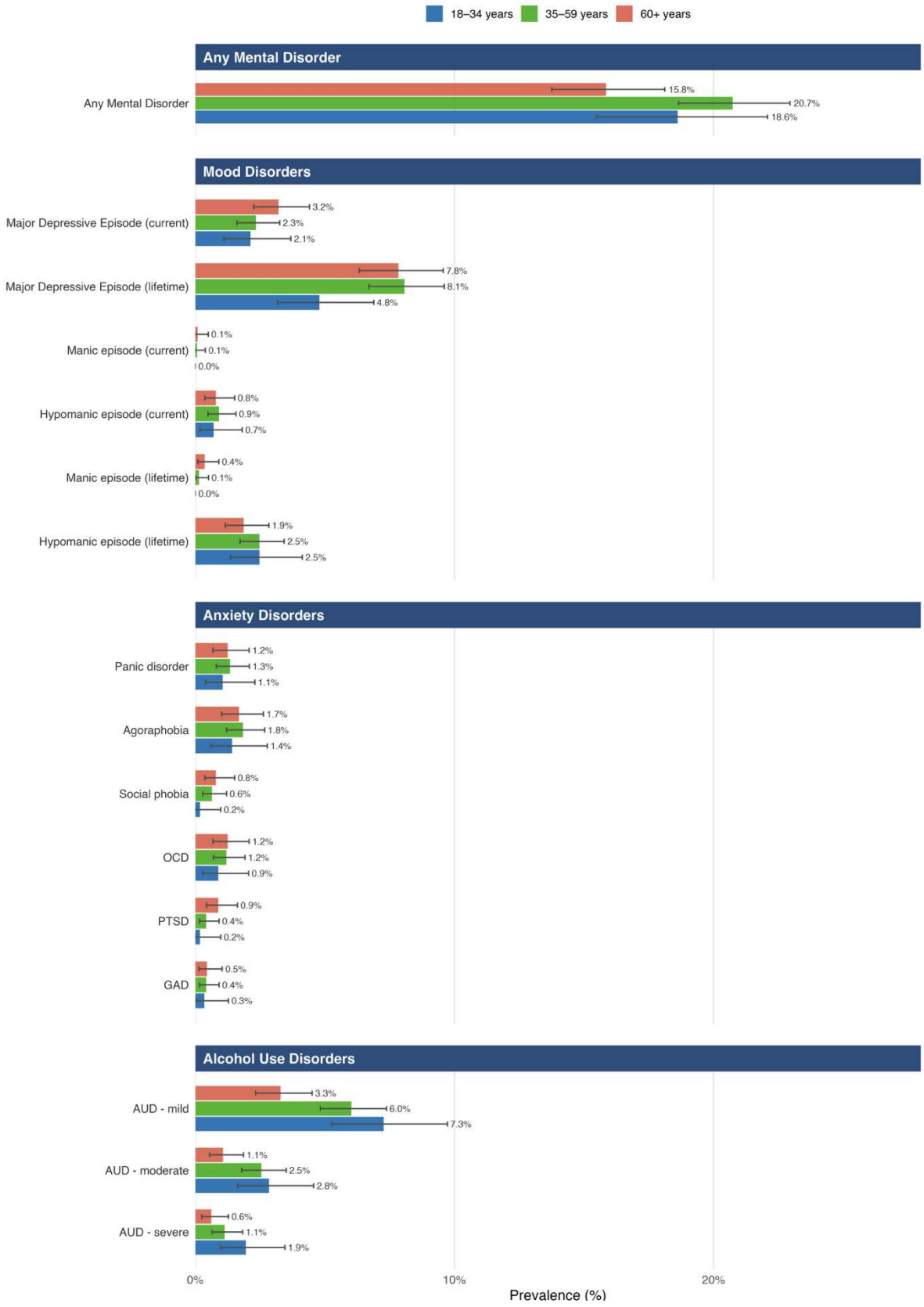
The prevalence of any mental disorder varied significantly across age groups: it was highest in respondents aged 35–59 years (20.7%; 95% CI: 18.7–23.0), followed by those aged 18–34 years (18.6%; 95% CI: 15.5–22.1), and lowest in respondents aged 60 years and older (15.9%; 95% CI: 13.8–18.1).

There were no significant differences in the overall prevalence of mood disorders across age groups ($p = 0.081$); prevalence ranged from 6.9% in the youngest group to 10.1% in those aged 35–59 and 9.6% in those aged 60 and older. Within this category, lifetime MDE was significantly less prevalent in the 18–34 group (4.8%) than in the 35–59 (8.1%) and 60+ groups (7.8%). Current MDE was comparable across age groups, ranging from 2.1% in the youngest to 3.2% in the oldest, with no significant differences. Manic and hypomanic episodes were the least prevalent in all age groups, with no significant differences.

Anxiety disorders were present in 3.2% of the 18–34 group, rising to 4.5% in the 35–59 group and 4.4% in those aged 60+ (no significant differences). Individual anxiety disorders were each present in fewer than 2% of respondents, with no significant age-related differences.

AUD showed the most pronounced age gradient: prevalence was highest in the 18–34 group (12.1%), followed by the 35–59 group (9.7%), and lowest in those aged 60 and older (5%). This declining pattern with age was consistent and statistically significant across all severity levels. Age-stratified distributions are shown in Figure 2 and Supplementary Table 1.

Figure 2: Prevalence of mental disorders in the nationally representative sample of the adult Slovak population in 2025, by age groups

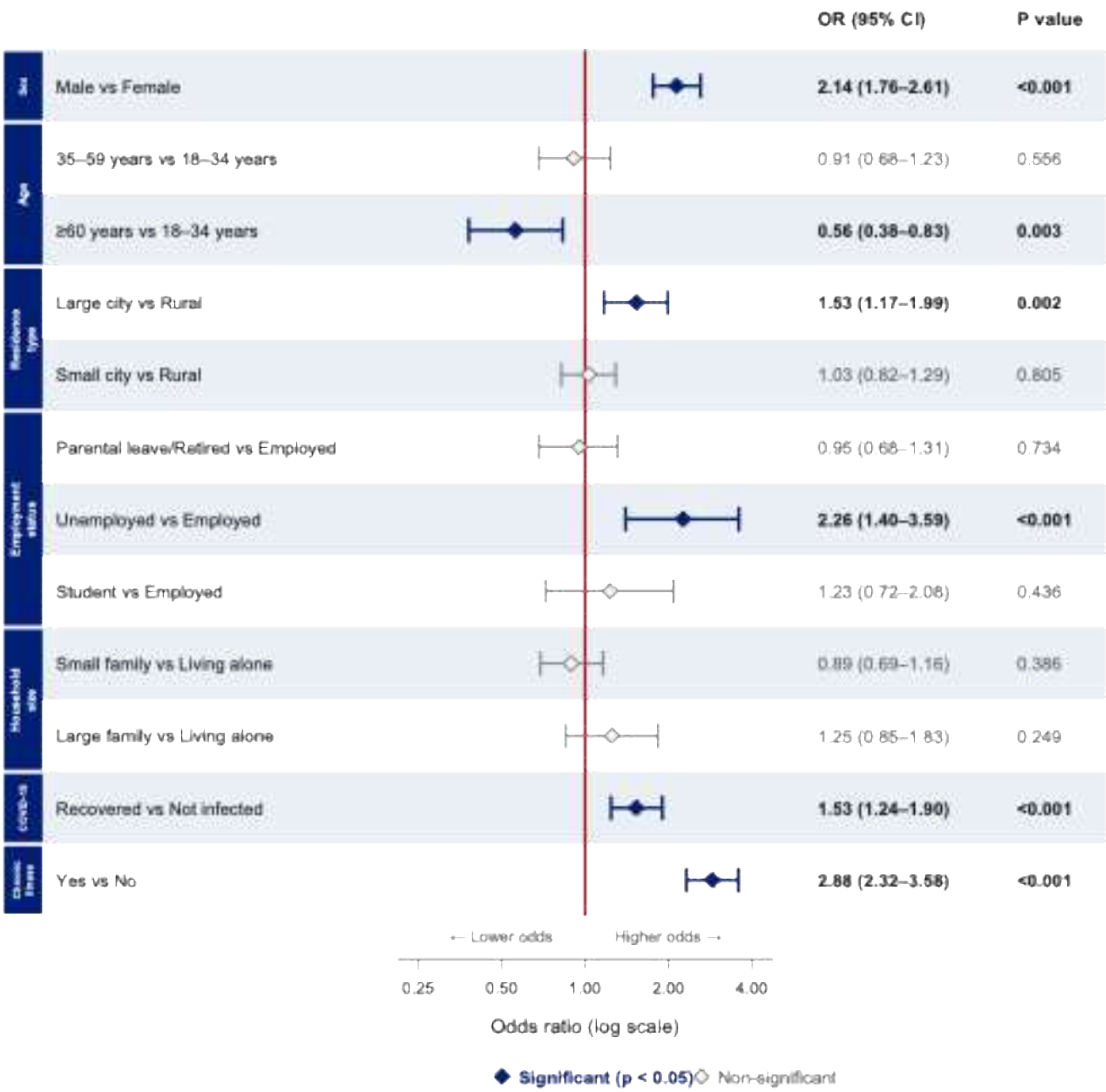


Bars represent prevalence estimates (%) for three age groups: 18-34 years (blue), 35-59 years (green), and 60+ years (red). Horizontal error bars indicate 95% confidence intervals. Unless otherwise specified, prevalence estimates reflect current cases per the M.I.N.I.'s disorder-specific timeframes (see Methods).
AUD = alcohol use disorder; GAD = generalized anxiety disorder; OCD = obsessive-compulsive disorder; PTSD = post-traumatic stress disorder.

Predictors of mental disorders

To identify independent predictors of any mental disorder, a binary logistic regression model was fitted. The strongest predictor was the presence of chronic health conditions: respondents with chronic conditions had nearly three times the odds of any mental disorder (OR=2.88). Men had more than twice the odds of mental disorder compared with women (OR=2.14); respondents aged 60 and older had significantly lower odds than those aged 18–34 (OR=0.56); and unemployment was associated with significantly higher odds compared with being employed or self-employed (OR=2.26). A history of COVID-19 infection also significantly increased the odds of mental disorder (OR=1.53; 95% CI: 1.24–1.90; $p<0.001$), after controlling for all other covariates. Respondents living in small cities had significantly higher odds compared with those in rural areas (OR=1.53). Full results are shown in Figure 3.

Figure 3: Independent predictors of any common mental disorder in the adult population of Slovakia in 2025



Forest plot showing odds ratios (OR) and 95% confidence intervals (CI) calculated using binary logistic regression. Filled diamonds and blue error bars indicate statistically significant associations ($p<0.05$); open diamonds indicate non-significant associations. COVID-19 = coronavirus disease 2019.

Discussion

This study provides the first large-scale, population-based estimates of mental disorder prevalence among adults in Slovakia using a structured diagnostic instrument. Nearly one in five adults (18.6%) met diagnostic criteria for at least one mental disorder, underscoring the substantial public health burden. Mood disorders were the most common category, affecting 9.4% of the sample, with no significant difference by sex ($p = 0.124$); lifetime MDE was the most frequently detected condition (7.4%). Anxiety disorders were present in 4.2% of respondents. AUD were the second most prevalent category overall (8.4%), with pronounced male predominance across all severity levels. Chronic physical comorbidity was the strongest independent predictor of mental disorder (OR=2.88). Male sex (OR=2.14, driven mainly by AUD), unemployment (OR=2.26), prior COVID-19 infection (OR=1.53), and large-city residence (OR=1.53) were each independently associated with increased odds of mental disorder, while age 60+ was associated with significantly lower odds (OR=0.56).

Several Slovak studies on mental disorders have been published previously, but none is directly comparable to ours: the EPID (Heretik 2003), EPIA (V. Novotný 2006), and EPIAF (Heretik A. jr. 2008) studies each focused on a single disorder category and used quota-based sampling. The only other recent general-population study in Slovakia (Kralova, Brazinova et al. 2022) was conducted in 2021 and reported elevated symptom rates (depressive symptoms 25%, anxiety symptoms 19%) during the COVID-19 pandemic, but used screening instruments rather than diagnostic tools. Other studies used student samples and are therefore not directly comparable or generalizable to the entire Slovak adult population (Hajduk, Heretik et al. 2019, Gavurova, Ivankova et al. 2022).

Compared with our estimated prevalence of 18.6%, GBD 2023 estimates for Slovakia are lower—13.5% across all ages and 14.2% in adults aged 20 years or older. However, the GBD figures rely on modelling existing data rather than primary survey data and should be interpreted with caution (Network 2024). A comparable study has been conducted in Czechia, whose findings provide a useful reference given the two countries' shared historical, socioeconomic, and healthcare context and the use of the same instrument (M.I.N.I.); that study estimated the prevalence of any mental disorder in the Czech adult population at 21.8% which is similar to our findings (Winkler, Formanek et al. 2018, Formanek, Kagstrom et al. 2019). The overall prevalence pattern largely mirrors international population studies, though direct comparisons should be interpreted cautiously given differences in sampling, methodology, and diagnostic instruments (Alonso, Angermeyer et al. 2004).

Sex differences were broadly consistent with global trends (Kayrouz, Karin et al. 2025), although some patterns diverged from the often cited finding of higher overall mental disorder prevalence in women. In our sample, men had higher overall prevalence of any mental disorder (23.4% vs. 14.2%), driven by AUD (16.2% vs. 1.5%), while women had higher prevalence of mood disorders (10.1% vs. 8.5%, a difference that was not statistically significant) and current anxiety disorders (5.7% vs. 2.5%). These differences likely reflect both biological and social factors, including hormonal influences, social role expectations, and gendered patterns of help-seeking and substance use (Addis and Mahalik 2003, Kuehner 2017). Lower reported alcohol use among women may also reflect underreporting due to social stigma or drinking patterns that do not meet full diagnostic criteria (White 2020). Women more frequently experience internalizing disorders such as depression and anxiety, linked to both biological mechanisms (e.g., hormonal regulation of stress) and social factors such as role pressure and lower social support. Men, on the other hand, more often experience externalizing disorders like substance use, reflecting social norms that encourage outward expressions of stress and reduced help-seeking behavior. These gender differences are consistently observed in studies conducted under the World Health Organization's (WHO) World Mental Health (WMH) Survey Initiative worldwide (Seedat, Scott et al. 2009).

Urban residence and age were significantly associated with the presence of mental disorder. The highest prevalence was observed among residents of large cities (22.2%, compared with 17.5% in small cities and 17.6% in rural areas), likely reflecting increased exposure to urban stressors—social deprivation, isolation, competitive environments, and inequalities (Gruebner, Rapp et al. 2017). A key underlining concept in these

associations is that social deprivation and isolation in urban settings may further amplify stress, loneliness, and feelings of exclusion, contributing to mental health problems (Sundquist, Frank et al. 2004).

Adults aged 35–59 years had the highest prevalence of mental disorders, followed by those aged 18–34—a pattern consistent with evidence that most common mental disorders onset in early adulthood (Solmi, Radua et al. 2022). This finding also aligns with WHO studies (McGrath, Al-Hamzawi et al. 2023) and a recent meta-analysis (Solmi, Radua et al. 2022), both of which suggest that the onset of most mental disorders (excluding organic and neurocognitive disorders) occurs in early adulthood. Prevalence was also somewhat higher among respondents with elementary education (20.5%) than among those with higher education (17.1%), although neither education nor income was included in the regression model. Lower socioeconomic status (e.g., lower education, income, or housing quality) is consistently associated with higher prevalence of common mental disorders such as depression and anxiety (Ridley, Rao et al. 2020, Jespersen, Madden et al. 2025), and recent studies increasingly emphasize the impact of social determinants of health on mental disorder occurrence (Kirkbride, Anglin et al. 2024).

Chronic physical health conditions were associated with a nearly threefold higher odds of mental disorders, underscoring the need for integrated care that addresses both physical and mental health. Somatic disorders are consistently associated worldwide with increased risk of mental health problems (Harter, Baumeister et al. 2007), and more than one-third of individuals with somatic illness have a comorbid mental disorder. This relationship is particularly strong for mood disorders, especially depression, reinforcing the need for integrated patient management in the health care system (Steffen, Nubel et al. 2020).

There are some limitations to our study that we acknowledge. There is a potential underreporting of sensitive conditions (e.g., alcohol use) and reliance on self-reported symptoms, which may be influenced by social desirability. Certain populations—including institutionalized individuals and those with severe mental illness—may have been underrepresented, potentially leading to underestimation of more severe disorders. Finally, the results reflect mental health status during the study period and may change over time with social or economic shifts. Strengths of the study include the use of a standardized diagnostic instrument (M.I.N.I.) and a rigorous, multistage sampling design that enables generalization to the adult Slovak population and allows for valid international comparisons.

Conclusions

This study provides the first comprehensive, population-based estimates of mental disorder prevalence in Slovakia using a structured diagnostic instrument. Mental disorders are common and represent a substantial public health burden. Alcohol use and mood disorders are the most prevalent mental disorders, and chronic somatic disease, unemployment, and male sex are the strongest independent risk factors. These findings highlight the need for targeted prevention, early detection, integrated mental health services, and policies addressing the social determinants of mental health.

References

Addis, M. E. and J. R. Mahalik (2003). "Men, masculinity, and the contexts of help seeking." Am Psychol **58**(1): 5-14.

Alonso, J., M. C. Angermeyer, S. Bernert, R. Bruffaerts, T. S. Brugha, H. Bryson, G. de Girolamo, R. Graaf, K. Demyttenaere, I. Gasquet, J. M. Haro, S. J. Katz, R. C. Kessler, V. Kovess, J. P. Lepine, J. Ormel, G. Polidori, L. J. Russo, G. Vilagut, J. Almansa, S. Arbabzadeh-Bouchez, J. Autonell, M. Bernal, M. A. Buist-Bouwman, M. Codony, A. Domingo-Salvany, M. Ferrer, S. S. Joo, M. Martinez-Alonso, H. Matschinger, F. Mazzi, Z. Morgan, P. Morosini, C. Palacin, B. Romera, N. Taub, W. A. Vollebergh and E. S. o. t. E. o. M. D. P. EsemeD/Mhedea Investigators (2004). "Prevalence of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project." Acta Psychiatr Scand Suppl(420): 21-27.

Amorim, P., Y. Lecrubier, E. Weiller, T. Hergueta and D. Sheehan (1998). "DSM-IH-R Psychotic Disorders: procedural validity of the Mini International Neuropsychiatric Interview (MINI). Concordance and causes for discordance with the CIDI." Eur Psychiatry **13**(1): 26-34.

Bražinová Alexandra, H. M., Majdan Marek, Kráľová Mária (2026). "NCT07129408: Epidemiological Study on the Prevalence of Mental Disorders in Slovakia (EpiMentDisSK)." ClinicalTrials.gov.

Collaborators, G. B. D. M. D. (2022). "Global, regional, and national burden of 12 mental disorders in 204 countries and territories, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019." Lancet Psychiatry **9**(2): 137-150.

Formanek, T., A. Kagstrom, P. Cermakova, L. Csemy, K. Mlada and P. Winkler (2019). "Prevalence of mental disorders and associated disability: Results from the cross-sectional CZEch mental health Study (CZEMS)." Eur Psychiatry **60**: 1-6.

Gavurova, B., V. Ivankova, M. Rigelsky, T. Mudarri and M. Miovsky (2022). "Somatic Symptoms, Anxiety, and Depression Among College Students in the Czech Republic and Slovakia: A Cross-Sectional Study." Front Public Health **10**: 859107.

Gerdner, A. and A. Hakansson (2022). "Prevalence and comorbidity in a Swedish adolescent community sample - gambling, gaming, substance use, and other psychiatric disorders." BMC Psychiatry **22**(1): 594.

Goodwin, R. D., C. Faravelli, S. Rosi, F. Cosci, E. Truglia, R. de Graaf and H. U. Wittchen (2005). "The epidemiology of panic disorder and agoraphobia in Europe." Eur Neuropsychopharmacol **15**(4): 435-443.

Gruebner, O., M. A. Rapp, M. Adli, U. Kluge, S. Galea and A. Heinz (2017). "Cities and Mental Health." Dtsch Arztebl Int **114**(8): 121-127.

Hajduk, M., A. Heretik, Jr., B. Vaseckova, L. Forgacova and J. Pecenak (2019). "Prevalence and correlations of depression and anxiety among Slovak college students." Bratisl Lek Listy **120**(9): 695-698.

Harter, M., H. Baumeister, K. Reuter, F. Jacobi, M. Hofler, J. Bengel and H. U. Wittchen (2007). "Increased 12-month prevalence rates of mental disorders in patients with chronic somatic diseases." Psychother Psychosom **76**(6): 354-360.

Heretik, A., Heretik, Anton jr, Ritomský, Alojz, Novotný, Vladimír, Pečeňák, Ján (2003). EPID - Epidemiológia depresie na Slovensku. Nove Zamky, Slovakia, Psychoproof.

Heretik A. jr., H. A. s., Novotný V., Ritomský A., Pečeňák J. (2008). EPIAF- Epidemiológia alkoholizmu a fajčenia na Slovensku. Nove Zamky, Slovakia, Psychoproof.

Hjorthoj, C., A. E. Sturup, J. J. McGrath and M. Nordentoft (2017). "Years of potential life lost and life expectancy in schizophrenia: a systematic review and meta-analysis." Lancet Psychiatry **4**(4): 295-301.

Chesney, E., G. M. Goodwin and S. Fazel (2014). "Risks of all-cause and suicide mortality in mental disorders: a meta-review." World Psychiatry **13**(2): 153-160.

IHME. (2026). "GBD Health Topics: Mental Health." Retrieved February 10 2026, 2026, from https://www.healthdata.org/research-analysis/health-topics.

Jespersen, A., R. A. Madden, H. C. Whalley, R. M. Reynolds, S. M. Lawrie, A. M. McIntosh and M. H. Iveson (2025). "Socioeconomic status and depression-a systematic review." Epidemiol Rev **47**(1).

Kayrouz, R., E. Karin, L. Staples, B. Dear, O. Nielssen and N. Titov (2025). "A review of the 257 meta-analyses of the differences between females and males in prevalence and risk, protective factors, and treatment outcomes for mental disorder." BMC Psychiatry **25**(1): 677.

Kirkbride, J. B., D. M. Anglin, I. Colman, J. Dykxhoorn, P. B. Jones, P. Patalay, A. Pitman, E. Soneson, T. Steare, T. Wright and S. L. Griffiths (2024). "The social determinants of mental health and disorder: evidence, prevention and recommendations." World Psychiatry **23**(1): 58-90.

Kralova, M., A. Brazinova, V. Sivcova and L. Izakova (2022). "Mental health of the Slovak population during COVID-19 pandemic: A cross-sectional survey." World J Clin Cases **10**(25): 8880-8892.
Kuehner, C. (2017). "Why is depression more common among women than among men?" Lancet Psychiatry **4**(2): 146-158.
Lewandowska, A., A. Silczuk, P. Mularczyk-Tomczewska, A. Duda-Zalewska, M. Jankowski and M. Gujski (2025). "Awareness of mental disorders and their risk factors - a nationwide cross-sectional survey among adults in Poland." Front Psychiatry **16**: 1599683.
Lieb, R., E. Becker and C. Altamura (2005). "The epidemiology of generalized anxiety disorder in Europe." Eur Neuropsychopharmacol **15**(4): 445-452.
McGrath, J. J., A. Al-Hamzawi, J. Alonso, Y. Altwaijri, L. H. Andrade, E. J. Bromet, R. Bruffaerts, J. M. C. de Almeida, S. Chardoul, W. T. Chiu, L. Degenhardt, O. V. Demler, F. Ferry, O. Gureje, J. M. Haro, E. G. Karam, G. Karam, S. M. Khaled, V. Kovess-Masfety, M. Magno, M. E. Medina-Mora, J. Moskalewicz, F. Navarro-Mateu, D. Nishi, O. Plana-Ripoll, J. Posada-Villa, C. Rapsey, N. A. Sampson, J. C. Stagnaro, D. J. Stein, M. Ten Have, Y. Torres, C. Vladescu, P. W. Woodruff, Z. Zarkov, R. C. Kessler and W. H. O. W. M. H. S. Collaborators (2023). "Age of onset and cumulative risk of mental disorders: a cross-national analysis of population surveys from 29 countries." Lancet Psychiatry **10**(9): 668-681.
Mikesell, C., E. J. Blevins, M. Eschtruth, K. Malvese, M. Wallace, Y. Zhou, Y. H. Lee, D. Allswede, M. Watanabe, N. Rotter and A. Basu (2025). "Implementing a trauma-informed approach in a tiered model of pediatric population mental health care: a pilot study in primary and secondary care." BMC Health Serv Res **25**(1): 1603.
Network, G. B. o. D. C. (2024). "Global Burden of Disease Study 2023 (GBD 2023) Results." Retrieved February 1, 2026, from https://vizhub.healthdata.org/gbd-results/.
Paykel, E. S., T. Brugha and T. Fryers (2005). "Size and burden of depressive disorders in Europe." Eur Neuropsychopharmacol **15**(4): 411-423.
Pini, S., V. de Queiroz, D. Pagnin, L. Pezawas, J. Angst, G. B. Cassano and H. U. Wittchen (2005). "Prevalence and burden of bipolar disorders in European countries." Eur Neuropsychopharmacol **15**(4): 425-434.
Qureshi, A., F. Collazos, N. Sobradiel, F. J. Eiroa-Orosa, M. Febrel, H. W. Revollo-Escudero, E. Andres, M. del Mar Ramos, M. Roca, M. Casas, A. Serrano-Blanco, J. I. Escobar and J. Garcia-Campayo (2013). "Epidemiology of psychiatric morbidity among migrants compared to native born population in Spain: a controlled study." Gen Hosp Psychiatry **35**(1): 93-99.
Rehm, J., R. Room, W. van den Brink and F. Jacobi (2005). "Alcohol use disorders in EU countries and Norway: an overview of the epidemiology." Eur Neuropsychopharmacol **15**(4): 377-388.
Ridley, M., G. Rao, F. Schilbach and V. Patel (2020). "Poverty, depression, and anxiety: Causal evidence and mechanisms." Science **370**(6522).
Seedat, S., K. M. Scott, M. C. Angermeyer, P. Berglund, E. J. Bromet, T. S. Brugha, K. Demyttenaere, G. de Girolamo, J. M. Haro, R. Jin, E. G. Karam, V. Kovess-Masfety, D. Levinson, M. E. Medina Mora, Y. Ono, J. Ormel, B. E. Pennell, J. Posada-Villa, N. A. Sampson, D. Williams and R. C. Kessler (2009). "Cross-national associations between gender and mental disorders in the World Health Organization World Mental Health Surveys." Arch Gen Psychiatry **66**(7): 785-795.
Sheehan, D. V., Y. Lecrubier, K. H. Sheehan, P. Amorim, J. Janavs, E. Weiller, T. Hergueta, R. Baker and G. C. Dunbar (1998). "The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10." J Clin Psychiatry **59 Suppl 20**: 22-33;quiz 34-57.
Silvestri, C., B. Carpita, E. Cassioli, M. Lazzeretti, E. Rossi, V. Messina, G. Castellini, V. Ricca, L. Dell'Osso, S. Bolognesi, A. Fagiolini, F. Voller and g. Mental Disorders Study (2023). "Prevalence study of mental disorders in an Italian region. Preliminary report." BMC Psychiatry **23**(1): 12.
Smith, W., T. Chey, B. Jalaludin, G. Salkeld and T. Capon (1995). "Increasing response rates in telephone surveys: a randomized trial." J Public Health Med **17**(1): 33-38.
Solmi, M., J. Radua, M. Olivola, E. Croce, L. Soardo, G. Salazar de Pablo, J. Il Shin, J. B. Kirkbride, P. Jones, J. H. Kim, J. Y. Kim, A. F. Carvalho, M. V. Seeman, C. U. Correll and P. Fusar-Poli (2022). "Age at onset of mental disorders worldwide: large-scale meta-analysis of 192 epidemiological studies." Mol Psychiatry **27**(1): 281-295.

Steffen, A., J. Nubel, F. Jacobi, J. Batzing and J. Holstiege (2020). "Mental and somatic comorbidity of depression: a comprehensive cross-sectional analysis of 202 diagnosis groups using German nationwide ambulatory claims data." BMC Psychiatry **20**(1): 142.
Sundquist, K., G. Frank and J. Sundquist (2004). "Urbanisation and incidence of psychosis and depression: follow-up study of 4.4 million women and men in Sweden." Br J Psychiatry **184**: 293-298.
Team, R. C. (2025). "R: A Language and Environment for Statistical Computing_. R Foundation for Statistical Computing." from https://www.R-project.org/.
Uhlhaas, P. J., C. G. Davey, U. M. Mehta, J. Shah, J. Torous, N. B. Allen, S. Avenevoli, T. Bella-Awusah, A. Chanen, E. Y. H. Chen, C. U. Correll, K. Q. Do, H. L. Fisher, S. Frangou, I. B. Hickie, M. S. Keshavan, K. Konrad, F. S. Lee, C. H. Liu, B. Luna, P. D. McGorry, A. Meyer-Lindenberg, M. Nordentoft, D. Ongur, G. C. Patton, T. Paus, U. Reininghaus, A. Sawa, M. Schoenbaum, G. Schumann, V. H. Srihari, E. Susser, S. K. Verma, T. W. Woo, L. H. Yang, A. R. Yung and S. J. Wood (2023). "Towards a youth mental health paradigm: a perspective and roadmap." Mol Psychiatry **28**(8): 3171-3181.
Union, E. (2024). "A comprehensive approach to mental health." Retrieved February 10, 2026, from https://commission.europa.eu/topics/public-health/european-health-union/comprehensive-approach-mental-health_en.
V. Novotný, A. H. S., A. Heretik, Jr, J. Pečeňák, A. Ritomský (2006). EPIA - Epidemiológia vybraných úzkostných porúch na Slovensku. Nove Zamky, Psychoproof.
Vinogradova, V. V., A. Kivite-Urtane, J. Vrublevska and E. Rancans (2022). "Anxiety Screening among the General Population of Latvia and Associated Factors." Medicina (Kaunas) **58**(9).
Walker, E. R., R. E. McGee and B. G. Druss (2015). "Mortality in mental disorders and global disease burden implications: a systematic review and meta-analysis." JAMA Psychiatry **72**(4): 334-341.
White, A. M. (2020). "Gender Differences in the Epidemiology of Alcohol Use and Related Harms in the United States." Alcohol Res **40**(2): 01.
WHO (2025). World mental health today: latest data. Geneva, Switzerland, WHO.
Winkler, P., T. Formanek, K. Mlada and P. Cermakova (2018). "The CZEch Mental health Study (CZEMS): Study rationale, design, and methods." Int J Methods Psychiatr Res **27**(3): e1728.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- supplement.docx