Moradi A, Nikbakht F, Sadeghi M, Shakeri MT, Mosafarkhani E. Risk factors of mental health disorders among immigrant and non-immigrant adolescent visiting healthcare centers: A population-based cross-sectional study. *Health Psychology Research.* 2025;e81240024
https://doi.org/10.14440/hpr.0035

Research Article

Risk Factors of Mental Health Disorders among Immigrant and Non-Immigrant Adolescent Visiting Healthcare Centers: A Population-based Cross-Sectional Study

Amin Moradi[1], Fateme Nikbakht[1], Masoumeh Sadeghi[1], Mohammad Taghi Shakeri[2], Ehsan Mosafarkhani[1,3]*

[1]Department of Epidemiology, Faculty of Health, Mashhad University of Medical Sciences, Mashhad 9177949025, Razavi Khorasan, Iran

[2]Department of Biostatistics, Faculty of Health, Mashhad University of Medical Sciences, Mashhad 9177949025, Razavi Khorasan, Iran

[3]Social Determinants of Health Research Center, Mashhad University of Medical Sciences, Mashhad 9177949025, Razavi Khorasan, Iran

Keywords: Mental disorders, Immigrants, Refugees, Adolescents, Iranian

Health Psychology Research

Vol. X, 2025

Background

Adolescence is a high-risk period for mental disorders, but prevalence and risk factors among Iranian and immigrant youth remain unclear.

Objective

This study aims to compare mental disorder prevalence and associated factors between Iranian and immigrant adolescents in Mashhad, Iran, to inform services.

Methods

This population-based cross-sectional study was conducted from March 2021 to December 2023 among adolescents aged 5–18 years visiting healthcare centers in Mashhad, Iran. The study population included all Iranian and immigrant adolescents who completed mental health evaluations documented in the Sina Electronic Health Record system (SinaEHR®). Logistic regression analysis was performed to identify factors associated with mental disorders, adjusting for sociodemographic variables. Candidate predictor variables with $p<0.25$ in bivariate analyses were included in the final multivariate model.

Results

Of 1,034,962 adolescents, 499,165 (48.2%) were female and 535,797 (51.8%) were male. The prevalence of mental disorders was 12.6% among Iranian adolescents and 14.4% among immigrants. Common conditions were anxiety, depression, hyperactivity, epilepsy, intellectual disability, and multi-symptom disorders. Significant risk factors included older age, female, underweight status, comorbidities, welfare service use, not living with both parents, abuse, family adversity, and secondhand smoke exposure (all $p<0.05$). Fruit consumption, physical activity, frequent meals, less gaming, and insurance coverage were protective (all $p<0.05$). For immigrants, residence cards offered additional protection ($p=0.02$). No significant differences in overall mental health status between groups.

Conclusion

Mental disorders affected a notable portion of both Iranian and immigrant adolescents, with key risk and protective factors identified. Despite slight variations, overall mental health status was comparable across groups, reflecting global patterns.

1. INTRODUCTION

Mental disorders constitute a leading contributor to the global burden of disease, impairing functioning and quality of life.[1] In 2019, approximately 970 million people worldwide were estimated to have a mental disorder, with anxiety and depression being the most prevalent.[2] Mental disorder is defined by significant disturbances in emotion

***Corresponding author:**
Ehsan Mosafarkhani
Department of Epidemiology, Faculty of Health, Mashhad University of Medical Sciences, Mashhad, Razavi Khorasan, Iran;
Social Determinants of Health Research Center, Mashhad University of Medical Sciences, Mashhad, Razavi Khorasan, Iran
Email: farkhanie@mums.ac.ir

regulation, cognition, or behavior that impair functioning.[3] They account for 41.9% of global disability[4] and the greatest burden of youth disability.[5] Furthermore, life expectancy is reduced by 10–15 years among those with mental illness.[6]

Psychiatric conditions commonly arise in childhood and adolescence, with at least half of lifetime mental disorders beginning before adulthood.[7] Untreated mental illness in youth is associated with short- and long-term morbidity and mortality across functioning.[8] However, many pediatric cases globally go undiagnosed and untreated until later in life. As part of its 2013–2020 Mental Health Action Plan, the World Health Organization highlighted the vital need for age- and sex-specific youth mental health data to inform policy and planning.[2]

Adolescence is a critical stage of development marked by rapid physical, cognitive, and psychosocial growth.[1] Global meta-analyses estimate the overall prevalence of mental disorders among children and adolescents to be 13.4%, with specific rates of 6.5% for anxiety disorders, 2.6% for depressive disorders, 3.4% for attention-deficit/hyperactivity disorder (ADHD), and 5.7% for disruptive disorders.[2] In Iran, adolescents comprise 14.22% of the population.[3] Amidst socioeconomic problems in Iran, such as unemployment and sanctions, a periodic assessment of youth mental health is deemed necessary. A recent Iranian study of 6–18-year-old individuals found a psychiatric disorder prevalence of 10.5%, with oppositional defiant disorder (ODD) being the most common overall.[4] ADHD demonstrated the highest prevalence among boys (5.03%) and ODD among girls (4.05%).

Forced migration due to insecurity, violence, and adversity can exact severe psychological and social harms.[6] Post-migration, immigrants contend with challenges, including unemployment, discrimination, loss, and health issues. Consequently, they demonstrate elevated vulnerability to disorders such as post-traumatic stress disorder (PTSD), mood disorders, and anxiety.[8] Over half of the world's refugees and asylum seekers are children and adolescents, many with emotional and social disturbances from displacement.[9] One study of Afghan and Iraqi immigrant adolescents in Iran found prevalence's of 80.1% for social dysfunction, 48.9% psychosomatic disorders, 39.3% anxiety, and 22.1% depression.[10] Overall, 88.5% suffered from some mental health problems.

An informed background on adolescent mental health requires understanding the prevalence and risk factors among immigrant, refugee, and native populations.[11] In 2021, approximately 1 million Afghan immigrants entered Iran, with many adolescents settling in suburban cities, including Mashhad. Their integration into schools alongside Iranian youth can mutually influence mental health, necessitating comparative health data for sound policy and planning.

This study hypothesized that immigrant adolescents exhibit a higher prevalence of mental disorders compared to Iranian adolescents due to migration-related stressors, with sociodemographic, behavioral, nutritional, and medical factors differentially impacting outcomes. It aimed to compare the prevalence of specific mental disorders (e.g., anxiety, depression, hyperkinetic disorders, epilepsy, and intellectual disability) and associated factors, including sociodemographic (e.g., age, gender, and living situation), behavioral (e.g., physical activity and gaming), nutritional (e.g., fruit consumption and meal frequency), and medical (e.g., comorbidities) factors, between Iranian and immigrant adolescents in Mashhad, Iran.

2. METHODS

2.1. PARTICIPANTS

The study population comprised all adolescents aged 5–18 years who visited healthcare centers in Mashhad, Iran, from March 2021 to December 2023 and had completed mental health evaluations documented in the Sina Electronic Health Record (SinaEHR®) system. Mashhad is a major urban center in northeastern Iran with a diverse population, including a significant Afghan immigrant community. A census sampling method was used to include all eligible adolescents in the SinaEHR® database, enhancing the representativeness of adolescents accessing primary care. However, undocumented immigrants may be underrepresented due to their reluctance to seek healthcare, as noted in Section 5 Limitations.

2.2. DATA COLLECTION

This cross-sectional study analyzed secondary data from 1,034,962 adolescents aged 5–18 years, extracted from the SinaEHR® system, with no direct participant interviews conducted. The study population included all Iranian and immigrant adolescents who were assessed at healthcare centers across Mashhad and had completed mental health evaluations documented in SinaEHR®.[12] A census sampling method was used. Immigrant status was defined by registration as an immigrant household in the university database. All assessments adhered to the national guidelines implemented in SinaEHR®.

2.3. MEASURES

The outcome variable or dependent variable was mental disorders. Predictors were identified from scientific literature and team expertise on associated risk factors. Variables comprised:

(i) Sociodemographic: Age, gender, health insurance status, living situation, and residence card status
(ii) Adverse exposures: Abuse, household smoking, and personal smoking history
(iii) Nutrition and lifestyle: Body mass index (BMI), fruit intake, meal frequency, fast food intake, gaming time, and physical activity
(iv) Medical history: Comorbidities and family history.

Mental health screening was conducted by trained healthcare providers using the Kessler Psychological Distress Scale (K6), which includes six statements assessing feelings of restlessness, depression, hopelessness, worthlessness, effort, and anxiety. The K6 is scored on a five-point scale (0 = never to 4 = always), with total scores ranging from 0 to 24. Adolescents scoring ⩾12 were considered positive and referred to physicians for further evaluation. Physicians confirmed diagnoses through clinical assessments and standardized tools following national guidelines, and registered diagnoses in the SinaEHR® system using the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10) codes. Inter-rater reliability and diagnostic validity of the clinical assessments were not evaluated in this secondary data analysis.[13] These diseases include diabetes (E10 and E11), hypertension (I10 and I15), hyperlipidemia (E78), cardiovascular diseases (ICD10: I20, I21, I24, I25, I63, and I70), neurological and mental disorders (F10, F11, F12, F13, F14, F15, F16,

F17, F18, F19, F70, F71, F72, F73, F00, F20, F22, F23, F25, F30, F31, F42, F44, F32, F34, F33, f43, F45, F50, F95, F52, F40, F84, F90, F91, G40, G41, T40, T51, F53, Y07, Y05, Y06, and T74), and common infectious diseases in immigrant adolescent, including tuberculosis (A15) and hepatitis B (B16). Ethical approval was obtained from Mashhad University of Medical Sciences (approval code: IR.MUMS.FHMPM.REC.1401.218). The study utilized anonymized secondary data from the SinaEHR® system, with no direct participant interaction. This study adhered to the strengthening the reporting of observational studies in epidemiology reporting guideline.

2.4. ANALYSIS

After the data collection was completed, the data were first coded and entered into Excel version 7.2.0.1 (Microsoft, United States [US]) and then exported to Stata version 14 (StataCorp, US) for analysis. Descriptive statistics were computed for each study variable. All variables were changed to categorical and dichotomous types and summarized using frequencies and percentages. Univariate analysis was performed for sociodemographic variables, mental disorder-related variables, and other important variables in the study. A multiple logistic regression model was used to identify risk factors for mental disorders. Independent variables with $p<0.25$ were selected as candidate variables for the multiple logistic regression model to identify the association between dependent and independent variables. The adjusted odds ratio (aOR) was calculated at a 95% confidence interval (CI), and $p<0.05$ was considered significant. A *post hoc* power analysis confirmed that the sample size of 1,034,962 adolescents provided >99% power to detect a 2% difference in mental disorder prevalence (12.6% vs. 14.4%) between Iranian and immigrant adolescents, assuming a 5% significance level and a two-sided test. Data quality checks included identifying outliers, duplicates, and implausible values, all of which were verified against the original dataset and excluded if necessary. Missing data were handled using multiple imputation with chained equations for variables with more than 5% missing, while variables with less than 5% missing were deleted or imputed as needed.

3. RESULTS

Of the 1,034,962 adolescents, 48.2% (n = 499,165) were female and 51.8% (n = 535,797) were male. There were 92.8% (n = 960,877) Iranian and 7.2% (n = 74,085) immigrant adolescents. Among immigrants, 67.0% (n = 49,629) had residence cards. Most adolescents (75.1%, n = 777,356) had normal BMI. The mean age with standard deviation was 11.3 ± 4.1 years for Iranians and 10.7 ± 3.8 years for immigrants. Mental disorder frequency was 12.6% in Iranians and 14.4% in immigrants. The most common condition was panic anxiety in Iranians and hyperkinetic disorders in immigrants. Complex interactions of demographic, social, behavioral, and medical factors contributed to mental health risks in the sample population (Table 1 and Figure 1).

The multiple logistic regression analysis revealed several factors associated with increased or decreased likelihood of mental disorders among the adolescents (Table 2). Older age (aOR: 1.08, 95% CI: 1.08–1.09), severely underweight (aOR: 1.69, 95% CI: 1.56–1.83), presence of comorbidities (aOR: 3.00, 95% CI: 2.86–3.14), presence of family history of comorbidities (aOR: 1.30, 95% CI: 1.26–1.34), not living with both parents such as with father only

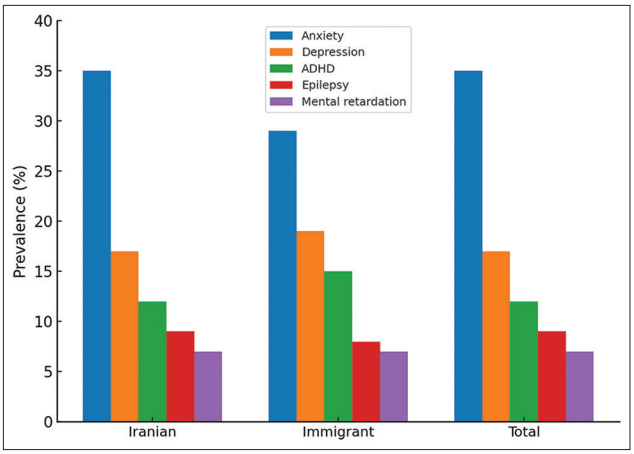

Figure 1. Prevalence of mental illnesses in the total sample population, immigrant adolescents, and Iranian adolescents
Abbreviation: ADHD: Attention-deficit/hyperactivity disorder.

(aOR: 1.86, 95% CI: 1.69–2.06), experienced child abuse (aOR: 1.59, 95% CI: 1.24–2.03), adverse family environments (aOR: 1.73, 95% CI: 1.64–1.83), the use of charity services (aOR: 3.55, CI: 3.32–3.81), and presence of secondhand smoke exposure (aOR: 1.41, 95% CI: 1.31–1.52) were all associated with significantly higher odds of mental disorders. Specifically, having comorbidities tripled the odds, while the use of charity services increased the odds by more than threefold. On the other hand, regularly eating fruit (aOR: 0.74, 95% CI: 0.69–0.79), engaging in physical activity (aOR: 0.69, 95% CI: 0.67–0.72), and consuming frequent meals (aOR: 0.61, 95% CI: 0.55–0.68) were protective against mental illness. In addition, having health insurance decreased the odds by 13% (aOR: 0.87, 95% CI: 0.82–0.92).

In multivariate analysis of immigrant adolescents (Table 3), several factors emerged as risk factors for mental disorders, including older age (aOR: 1.09, 95% CI: 1.08–1.10), presence of family history of comorbidities (aOR: 1.29, 95% CI: 1.14–1.46), living with non-parents (aOR: 2.32, 95% CI: 1.54–3.48), experienced child abuse (aOR: 2.87, 95% CI: 1.48–5.54), presence of comorbidities (aOR: 3.47, 95% CI: 2.91–4.12), having a residency card (aOR: 1.21, 95% CI: 1.09–1.34), and presence of fragile family circumstances (aOR: 2.14, 95% CI: 1.76–2.60). In contrast, 2-h gaming time (aOR: 0.77, 95% CI: 0.68–0.87) compared to more-than-2-h gaming time, more-than-420-min physical activity per week (aOR: 0.71, 95% CI: 0.61–0.83) compared to without purposeful activity, and equal to or more than two shares of fruit consumption (aOR: 0.62, 95% CI: 0.51–0.74) compared to rarely fruit consumption had protective effects on mental disorders.

In multivariate analysis of Iranian adolescents (Table 4), factors associated with increased likelihood of mental disorders included older age (aOR: 1.08, 95% CI: 1.08–1.09), severely underweight (aOR: 1.68, 95% CI: 1.55–1.82), presence of family history of comorbidities (aOR: 1.30, 95% CI: 1.26–1.34), presence of comorbidities (aOR: 2.97, 95% CI: 2.83–3.11), not living with both parents (e.g., aOR: 1.60, 95% CI: 1.51–1.70 for living with mother only), experienced child abuse (aOR: 1.81, 95% CI: 1.40–2.35), presence of fragile family circumstances (aOR: 1.71, 95% CI: 1.62–1.81), and smoking in front of the child (aOR: 1.43, 95% CI: 1.33–1.54). In contrast, male gender (aOR: 0.85, 95% CI: 0.83–0.87), equal to or more than two shares of fruit consumption (aOR: 0.75,

Table 1. Demographic characteristics of the study population

Variable	Iranian		Immigrants		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Age	11.32±4.08		10.65±3.80		11.27±4.06	
Body mass index						
Normal weight	719,881	74.92	57,321	77.37	777,202	75.09
Over weight	100,827	10.49	6,966	9.40	107,793	10.42
Obesity	63,471	6.61	3,947	5.33	67,418	6.51
Severely underweight	15,291	1.59	1,119	1.51	16,410	1.59
Underweight	61,407	6.39	4,732	6.39	66,139	6.39
Comorbidities						
No	933,778	97.18	72,268	97.55	1,006,046	97.21
Yes	27,099	2.82	1,817	2.45	28,916	2.79
Family history of comorbidities						
No	826,251	85.99	64,480	87.04	890,731	86.06
Yes	134,626	14.01	9,605	12.96	144,231	13.94
Charity organization						
No	952,676	99.15	73,924	99.78	1,026,600	99.19
Yes	8,201	0.85	161	0.22	8,362	0.81
Insurance						
No	897,643	93.42	73,871	99.71	971,514	93.87
Yes	63,234	6.58	214	0.29	63,448	6.13
Living situation						
Living with parents	919,616	95.71	70,567	95.25	990,183	95.67
Living with mother	24,799	2.58	2,227	3.01	27,026	2.61
Living with father	8,318	0.87	500	0.67	8,818	0.85
Living with non-parents	4,783	0.50	448	0.60	5,231	0.51
Living with wife and children	558	0.06	56	0.08	614	0.06
Living with wife	2,803	0.29	278	0.39	3,090	0.30
Fruit intake						
Rarely	25,406	2.64	4,271	5.76	29,677	2.87
Less than 2 shares	304,082	31.65	32,849	44.34	336,931	32.55
Equal to or more than 2 shares	831,389	65.71	36,965	49.90	668,354	64.58
Meal frequency						
2 meals or less	7,289	0.76	807	1.09	8,096	0.78
3–5 meals	400,404	41.67	37,977	51.26	438,381	42.36
More than 5 meals	553,187	57.57	35,301	47.65	588,485	56.86
Fast food consumption						
Every day	33,287	3.46	3,035	4.10	36,322	3.51
Weekly	250,471	26.07	19,170	25.88	269,641	26.05
Rarely	677,119	70.47	51,880	70.03	728,999	70.44
Gaming time						
More than 2 h	286,320	29.80	22,729	30.68	309,049	29.86
2 h	278,034	28.94	22,728	30.68	300,762	29.06
Less than 2 h	396,523	41.27	28,628	38.64	425,151	41.08
Physical activity per week						
Without purposeful activity	71,813	7.47	7,118	9.61	78,931	7.63
Less than 420 min per week	232,677	24.22	21,167	28.57	253,844	24.53
More than 420 min per week	656,387	68.31	45,800	61.82	702,187	67.85
Adverse childhood experiences						
No problem	936,102	97.42	71,936	97.10	1,008,038	97.40
Child abuse	1,348	0.14	138	0.19	1,486	0.14
Fragile family circumstances	2,342	2.44	2,011	2.71	25,438	2.46
Gender						
Female	462,555	48.14	36,610	49.42	499,165	48.23
Male	498,322	51.86	37,475	50.54	535,797	51.77
Smoking in front of the child						
No	922,761	96.03	71,740	96.83	994,501	96.09

(Cont'd...)

Table 1. ***(Continued)***

Variable	Iranian		Immigrants		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Yes	38,119	3.97	2,345	3.17	40,461	3.91
Buying cigarettes by a child						
No	955,681	99.46	73,715	99.50	1,029,396	99.46
Yes	5,196	0.54	370	0.50	5,566	0.54
Exposure to cigarette smoke						
No	939,137	97.74	72,787	98.25	1,011,924	97.77
Yes	21,740	2.26	1,298	1.75	23,038	2.23
Nationality						
Immigrant	0	0	74,085	100	74,085	7.16
Iranian	960,877	100	0	0	960,877	92.84
Residence card						
No	-	-	24,456	33.01	24,456	33.01
Yes	-	-	49,629	66.99	49,629	66.99

Table 2. Univariate and multivariate logistic regression for psychological outcomes in adolescents

Variables	Crude odds ratio (OR)			Adjusted odds ratio (aOR)		
	OR	CI	*p*-value	aOR	CI	*p*-value
Age	1.09	1.09–1.10	<0.001	1.08	1.08–1.09	<0.001
Normal weight	Reference	-	-	-	-	-
Over weight	1.18	1.14–1.23	<0.001	1	0.96–1.04	0.798
Obesity	1.28	1.22–1.34	<0.001	1.09	1.04–1.14	<0.001
Severely underweight	1.89	1.76–2.04	<0.001	1.69	1.56–1.83	<0.001
Underweight	1.23	1.18–1.29	<0.001	1.24	1.18–1.30	<0.001
Comorbidities						
No	Reference	-	-	-	-	-
Yes	3.67	3.51–3.83	<0.001	3	2.86–3.14	<0.001
Family history of comorbidities						
No	Reference	-	-	-	-	-
Yes	1.69	1.64–1.74	<0.001	1.3	1.26–1.34	<0.001
Charity organization						
No	Reference	-	-	-	-	-
Yes	6.7	6.30–7.13	<0.001	3.55	3.32–3.81	<0.001
Insurance						
No	Reference	-	-	-	-	-
Yes	0.89	0.85–0.94	<0.001	0.87	0.82–0.92	<0.001
Living situation						
Living with parents	Reference	-	-	-	-	-
Living with mother	2.34	2.22–2.47	<0.001	1.57	1.48–1.66	<0.001
Living with father	2.04	1.85–2.25	<0.001	1.86	1.69–2.06	<0.001
Living with non-parents	2.86	2.56–3.19	<0.001	1.79	1.60–2.01	<0.001
Living with wife and children	2.91	2.12–3.98	<0.001	2.15	1.56–2.95	<0.001
Living with wife	2.73	2.36–3.15	<0.001	2.09	1.81–2.42	<0.001
Fruit intake						
Rarely	Reference	-	-	-	-	-
Less than 2 shares	0.77	0.72–0.82	<0.001	0.9	0.84–0.96	0.002
Equal to or more than 2 shares	0.57	0.54–0.61	<0.001	0.74	0.69–0.79	<0.001
Meal frequency						
2 meals or less	Reference	-	-	-	-	-
3–5 meals	0.47	0.43–0.52	<0.001	0.63	0.57–0.70	<0.001
More than 5 meals	0.4	0.37–0.44	<0.001	0.61	0.55–0.68	<0.001
Fast food consumption						
Every day	Reference	-	-	-	-	-
Weekly	0.76	0.72–0.81	<0.001	0.89	0.83–0.94	<0.001

(Cont'd...)

Table 2. ***(Continued)***

Variables	Crude odds ratio (OR)			Adjusted odds ratio (aOR)		
	OR	CI	*p*-value	aOR	CI	*p*-value
Rarely	0.68	0.64–0.72	<0.001	0.87	0.82–0.92	<0.001
Gaming time						
More than 2 h	Reference	-	-	-	-	-
2 h	0.71	0.69–0.73	<0.001	0.79	0.76–0.82	<0.001
Less than 2 h	0.75	0.73–0.77	<0.001	0.9	0.87–0.93	<0.001
Physical activity per week						
Without purposeful activity	Reference	-	-	-	-	-
Less than 420 min per week	0.7	0.67–0.73	<0.001	0.81	0.77–0.84	<0.001
More than 420 min per week	0.55	0.53–0.57	<0.001	0.69	0.67–0.72	<0.001
Adverse childhood experiences						
No problem	Reference	-	-	-	-	-
Child abuse	1.93	1.52–2.46	<0.001	1.59	1.24–2.03	<0.001
Fragile family circumstances	2.92	2.77–3.07	<0.001	1.73	1.64–1.83	<0.001
Gender						
Female	Reference	-	-	-	-	-
Male	0.85	0.83–0.87	<0.001	0.85	0.83–0.87	<0.001
Smoking in front of the child						
No	Reference	-	-	-	-	-
Yes	1.84	1.76–1.93	<0.001	1.41	1.31–1.52	<0.001
Buying cigarettes by a child						
No	Reference	-	-	-	-	-
Yes	2.28	2.04–2.56	<0.001	1.14	1.01–1.30	0.031
Exposure to cigarette smoke						
No	Reference	-	-	-	-	-
Yes	1.91	1.79–2.03	<0.001	1.07	0.97–1.18	0.11
Nationality						
Immigrant	Reference	-	-	-	-	-
Iranian	1.07	1.2–1.12	0.004	1.03	0.98–1.09	0.135

Abbreviation: CI: Confidence interval.

Table 3. Univariate and multivariate logistic regression for psychological outcomes in immigrant adolescents

Variables	Crude odds ratio (OR)			Adjusted odds ratio (aOR)		
	OR	CI	*p*-value	aOR	CI	*p*-value
Age	1.1	1.09–1.11	<0.001	1.09	1.08–1.10	<0.001
Body mass index						
Normal weight	Reference	-	-	-	-	-
Over weight	1.25	1.08–1.46	0.003	1.05	0.90–1.22	0.53
Obesity	1.42	1.18–1.71	<0.001	1.18	0.98–1.43	0.076
Severely underweight	1.95	1.46–2.62	<0.001	1.84	1.36–2.47	<0.001
Underweight	1.11	0.92–1.34	0.27	1.11	0.91–1.34	0.272
Comorbidities						
No	Reference	-	-	-	-	-
Yes	4.27	3.61–5.04	<0.001	3.47	2.91–4.12	<0.001
Family history of comorbidities						
No	Reference	-	-	-	-	-
Yes	1.76	1.56–1.97	<0.001	1.29	1.14–1.46	<0.001
Charity organization						
No	Reference	-	-	-	-	-
Yes	3.83	2.21–6.64	<0.001	1.76	0.98–3.17	0.058
Insurance						
No	Reference	-	-	-	-	-
Yes	1.15	0.51–2.60	0.72	-	-	-
Living situation						
Living with parents	Reference	-	-	-	-	-

(Cont'd...)

Table 3. ***(Continued)***

Variables	Crude odds ratio (OR)			Adjusted odds ratio (aOR)		
	OR	CI	*p*-value	aOR	CI	*p*-value
Living with mother	1.35	1.06–1.72	0.014	1.11	0.87–1.42	0.378
Living with father	1.53	0.95–2.46	0.075	1.31	0.81–2.12	0.268
Living with non-parents	2.63	1.78–3.90	<0.001	2.32	1.54–3.48	<0.001
Living with wife and children	1.52	0.37–6.25	0.559	1.25	0.30–5.23	0.753
Living with wife	1.79	1.00–3.20	0.048	1.49	0.83–2.68	0.18
Fruit intake						
Rarely	Reference	-	-	-	-	-
Less than 2 shares	0.72	0.61–0.86	<0.001	0.81	0.68–0.97	0.025
Equal to or more than 2 shares	0.52	0.44–0.62	<0.001	0.62	0.51–0.74	<0.001
Meal frequency						
2 meals or less	Reference	-	-	-	-	-
3–5 meals	0.68	0.47–0.98	0.043	0.89	0.61–1.31	0.583
More than 5 meals	0.6	0.41–0.87	0.007	0.92	0.63–1.35	0.689
Fast food consumption						
Every day	Reference	-	-	-	-	-
Weekly	0.94	0.75–1.19	0.659	1.05	0.82–1.33	0.687
Rarely	0.84	0.67–1.05	0.138	1	0.79–1.26	0.98
Gaming time						
More than 2 h	Reference	-	-	-	-	-
2 h	0.71	0.63–0.80	<0.001	0.77	0.68–0.87	<0.001
Less than 2 h	0.74	0.66–0.83	<0.001	0.88	0.78–0.99	0.033
Physical activity per week						
Without purposeful activity	Reference	-	-	-	-	-
Less than 420 min per week	0.77	0.67–0.90	0.001	0.85	0.73–0.99	0.044
More than 420 min per week	0.59	0.52–0.69	<0.001	0.71	0.61–0.83	<0.001
Adverse childhood experiences						
No problem	Reference	-	-	-	-	-
Child abuse	3.3	1.73–6.30	<0.001	2.87	1.48–5.54	0.002
Fragile family circumstances	3.02	2.51–3.62	<0.001	2.14	1.76–2.60	<0.001
Gender						
Female	Reference	-	-	-	-	-
Male	0.9	0.82–0.99	0.045	0.93	0.84–1.02	0.151
Smoking in front of the child						
No	Reference	-	-	-	-	-
Yes	1.8	1.47–2.22	<0.001	1.12	0.81–1.54	0.474
Buying cigarettes by a child						
No	Reference	-	-	-	-	-
Yes	2.55	1.65–3.93	<0.001	1.35	0.82–2.21	0.231
Exposure to cigarette smoke						
No	Reference	-	-	-	-	-
Yes	2.15	1.66–2.77	<0.001	1.39	0.93–2.06	0.099
Residence card						
No	Reference	-	-	-	-	-
Yes	1.25	1.13–1.39	<0.001	1.21	1.09–1.34	<0.001

Abbreviation: CI: Confidence interval.

95% CI: 0.70–0.80) compared to rarely fruit consumption, more-than-420-min physical activity per week (aOR: 0.69, 95% CI: 0.66–0.72) compared to without purposeful activity, and consuming five meals (aOR: 0.59, 95% CI: 0.53–0.66) compared to two meals or less were protective against mental disorders. Notably, people who were covered by charity were 3 times more likely to suffer from mental disorders than people who were not covered by charity (aOR: 3.59, CI: 3.35–3.85), while having health insurance had a protective effect on mental disorders (aOR: 0.87, 95% CI: 0.82–0.92).

4. DISCUSSION

This cross-sectional study of over 1 million adolescents in Mashhad, Iran, revealed similar overall mental disorder prevalence's of 12.6% in Iranian adolescents and 14.4% in immigrant adolescents. The most common conditions were panic anxiety, depression, hyperkinetic disorders, epilepsy, mental retardation, and multi-condition symptoms. Significant risk factors for mental disorders included older

Table 4. Univariate and multivariate logistic regression for psychological outcomes in Iranian adolescents

Variables	Crude odds ratio (OR)			Adjusted odds ratio (aOR)		
	OR	CI	*p*-value	aOR	CI	*p*-value
Age	1.09	1.09–1.10	<0.001	1.08	1.08–1.09	<0.001
Body mass index						
Normal weight	Reference	-	-	-	-	-
Over weight	1.18	1.13–1.23	<0.001	1	0.934	0.96–1.04
Obesity	1.27	1.21–1.33	<0.001	1.08	0.001	1.03–1.14
Severely underweight	1.89	1.75–2.04	<0.001	1.68	<0.001	1.55–1.82
Underweight	1.24	1.18–1.30	<0.001	1.25	<0.001	1.19–1.32
Comorbidities						
No	Reference	-	-	-	-	-
Yes	3.63	3.47–3.79	<0.001	2.97	<0.001	2.83–3.11
Family history of comorbidities						
No	Reference	-	-	-	-	-
Yes	1.69	1.64–1.74	<0.001	1.3	<0.001	1.26–1.34
Charity organization						
No	Reference	-	-	-	-	-
Yes	6.75	6.34–7.18	<0.001	3.59	<0.001	3.35–3.85
Insurance						
No	Reference	-	-	-	-	-
Yes	0.89	0.84–0.94	<0.001	0.87	<0.001	0.82–0.92
Living situation						
Living with parents	Reference	-	-	-	-	-
Living with mother	2.43	2.30–2.57	<0.001	1.6	<0.001	1.51–1.70
Living with father	2.07	1.88–2.29	<0.001	1.9	<0.001	1.72–2.10
Living with non-parents	2.88	2.57–3.23	<0.001	1.77	<0.001	1.57–1.99
Living with wife and children	3.05	2.21–4.21	<0.001	2.22	<0.001	1.60–3.09
Living with wife	2.82	2.43–3.28	<0.001	2.15	<0.001	1.85–2.50
Fruit intake						
Rarely	Reference	-	-	-	-	-
Less than 2 shares	0.77	0.72–0.83	<0.001	0.91	0.014	0.85–0.98
Equal to or more than 2 shares	0.57	0.54–0.61	<0.001	0.75	<0.001	0.70–0.80
Meal frequency						
2 meals or less	Reference	-	-	-	-	-
3–5 meals	0.46	0.42–0.51	<0.001	0.61	<0.001	0.55–0.68
More than 5 meals	0.39	0.35–0.43	<0.001	0.59	<0.001	0.53–0.66
Fast food consumption						
Every day	Reference	-	-	-	-	-
Weekly	0.75	0.71–0.80	<0.001	0.88	<0.001	0.82–0.93
Rarely	0.67	0.63–0.71	<0.001	0.86	<0.001	0.80–0.91
Gaming time						
More than 2 h	Reference	-	-	-	-	-
2 h	0.71	0.68–0.73	<0.001	0.79	<0.001	0.77–0.82
Less than 2 h	0.75	0.73–0.77	<0.001	0.9	<0.001	0.88–0.93
Physical activity per week						
Without purposeful activity	Reference	-	-	-	-	-
Less than 420 min per week	0.69	0.66–0.72	<0.001	0.8	<0.001	0.77–0.84
More than 420 min per week	0.54	0.52–0.56	<0.001	0.69	<0.001	0.66–0.72
Adverse childhood experiences						
No problem	Reference	-	-	-	-	-
Child abuse	1.81	1.40–2.35	<0.001	1.48	0.003	1.14–1.92
Fragile family circumstances	2.91	2.76–3.07	<0.001	1.71	<0.001	1.62–1.81
Gender						
Female	Reference	-	-	-	-	-
Male	0.84	0.82–0.86	<0.001	0.85	<0.001	0.83–0.87
Smoking in front of the child						
No	Reference	-	-	-	-	-

(Cont'd...)

Table 4. ***(Continued)***

Variables	Crude odds ratio (OR)			Adjusted odds ratio (aOR)		
	OR	CI	*p*-value	aOR	CI	*p*-value
Yes	1.84	1.75–1.940	<0.001	1.43	<0.001	1.33–1.54
Buying cigarettes by a child						
No	Reference	-	-	-	-	-
Yes	2.26	2.01–2.55	<0.001	1.13	0.053	0.99–1.30
Exposure to cigarette smoke						
No	Reference	-	-	-	-	-
Yes	1.89	1.78–2.02	<0.001	1.06	0.197	0.96–1.16

Abbreviation: CI: Confidence interval.

age, female gender, underweight status, presence of comorbidities, experience with charity services, not living with both parents, child abuse experience, adverse family environments, and secondhand smoke exposure. Protective factors included fruit consumption, physical activity, frequent meals, limited gaming, and having health insurance.

These findings confirm the intricate interplay of genetic, environmental, behavioral, and social factors impacting mental health.[14] Notably, Iranian and immigrant adolescents had comparable overall mental disorder prevalence's, a finding aligning with the previous studies showing equal or better mental health among immigrant youth.[15] Such trends highlight the heterogeneity within immigrant populations regarding mental disorder outcomes. When examining specific mental health domains, immigrants fared better across emotional and hyperactivity measures, further emphasizing the complexity of psychiatric risks among displaced groups. Ultimately, more research is warranted to investigate the resilience, risks, and unique needs influencing immigrant mental health during critical developmental stages.

Studies have reported varying prevalence and patterns of mental disorders among youth globally and within Iran. For example, a study of refugee children reported that the most frequent psychiatric diagnoses were emotional, developmental, and behavioral disorders.[16] Meanwhile, research in East Azerbaijan, Iran, revealed that the common conditions were enuresis, ADHD, specific phobias, and separation anxiety, with girls having higher rates of panic, social phobia, specific phobia, and agoraphobia, while boys showed more conduct disorder.[17] In the Sistan and Baluchestan province in Iran, the highest prevalences of specific psychiatric disorders were behavioral disorders (6.8%) and anxiety disorders (6.7%), followed by substance abuse (5.9%), neurodevelopmental disorders (4.8%), and urinary incontinence (2.4%); while the lowest prevalences were autism (0.1%), panic disorder (0.1%), and PTSD (0.2%).[18]

A national Iranian survey of over 30,000 adolescents found that 22.3% had at least one mental disorder, with the most prevalent being anxiety (14.13%) and behavior disorders (8.3%), while eating disorders (0.13%) and psychosis (0.26%) were less common.[19] Similarly, an Australian study discovered that 13.9% of 4–17-year-old adolescents experienced a mental disorder in the past year, primarily anxiety disorders (9.9%), ADHD (7.7%), major depression (2.8%), and conduct disorder (2.1%).[20] The prevalence was higher in boys (16%) than in girls (11.5%). Collectively, these studies reveal complex geographic and demographic patterns in youth mental health that warrant further investigation.

The current findings of mental disorder prevalence increasing with age are aligned with prior research.[21] In addition, extensive studies link excessive internet and gaming to psychosocial problems and mental illness, such as depression, ADHD, mood and anxiety disorders, personality disorders, and obsessive-compulsive disorder.[22] The current results of a higher prevalence of mental disorders in adolescents who spend more than 2 h daily in gaming corroborate these previous studies. However, emerging research indicates that game-based digital therapies can effectively address youth mental health conditions.[23]

Furthermore, not living with both parents emerged as a predictor of mental disorders, corroborating other studies identifying single-parent households as a risk factor for youth psychological distress.[24] For example, Swedish data suggest that parental separation elevates psychosis risk later in life.[25] Notably, physical health comorbidities tripled the likelihood of mental illness in the current sample population. Likewise, previous research reported that psychological distress was more common in students with chronic medical conditions.[26] Family history of psychiatric disorders is also associated with youth mental illness in the current and previous studies.[27] Ultimately, complex relationships potentially exist among medical, genetic, environmental, and social factors in shaping youth mental health trajectories. Therefore, further multidimensional, longitudinal studies are needed to elucidate these pathways.

This study also revealed that child welfare service involvement is associated with elevated mental health risks, echoing systematic reviews showing higher rates of mental disorders and suicide attempts in this population.[28] In addition, severe underweight status was found to predict mental illness. Prior research has shown that underweight individuals are more likely to experience depression, with underweight adolescent boys exhibiting higher rates of comorbid depression.[29] Moreover, self-perceiving as underweight is associated with a two-fold increase in depression risk compared with perceiving as normal weight.[30]

Secondhand smoke exposure likewise emerged as a risk factor. Studies conducted in China,[31] the US,[32] and among Syrian refugees[33] have similarly documented higher rates of psychopathology among youth exposed to tobacco smoke. Together, these findings indicate that secondhand smoke exposure may profoundly impact neurodevelopment and emotional functioning.

The interplay of complex social and medical factors appears to shape mental disorder susceptibility among Iranian and immigrant adolescents. Further research clarifying these pathways is essential for developing targeted, evidence-based prevention, and treatment strategies. On the other hand, child abuse emerged as a salient risk factor, aligning with evidence linking maltreatment to youth mental illness and substance abuse.[34] Studies in Iran have similarly reported associations among child abuse, psychological distress, and sexual victimization.[35]

Fragile family environments were also predictive of psychiatric disorder, increasing odds among Iranian (1.71 times) and immigrant (2.14 times) adolescents. Previous research confirms that unstable, dysfunctional families jeopardize long-term mental health.[35] For immigrants and refugees specifically, adversarial family contexts have been shown to further elevate psychopathology risk.[36] Disentangling the complex biopsychosocial pathways through which early childhood adversity becomes biologically embedded—and ultimately confers mental health vulnerability—remains an urgent priority if targeted, trauma-informed services are to effectively interrupt these cascades.

Gender patterns also warrant attention. In the study by Kwak *et al*.,[37] girls from both immigrant and non-immigrant groups reported experiencing more stress and chronic psychosomatic illnesses, though psychological illness and life satisfaction did not differ by sex. Our data revealed a protective effect of male gender against mental illness, though findings in the literature are mixed. Some studies suggest higher rates of addiction and neurodevelopmental disorders among males,[35] whereas others reported higher rates of psychological illnesses among girls,[38] underscoring the complexity of gender differences in mental health. In addition, health behaviors further shape risk. Insufficient physical activity and lower fitness levels have been associated with psychological distress,[39] whereas exercise can reduce screen time and thereby protect against mental disorders.[38] Our findings corroborate this protective role of physical activity. Thus, further multidimensional, gender-sensitive research is essential to elucidate intersections across biological factors, health behaviors, and social dynamics influencing youth mental health over the life course.

Taken together, these findings align with the socio-ecological model, which emphasizes the interplay of individual (e.g., physical activity and fruit consumption), interpersonal (e.g., family environment and child abuse), and environmental (e.g., secondhand smoke exposure) factors in shaping mental health.[40] The higher prevalence of mental disorders in older adolescents may reflect increased stress during developmental transitions, as described by Erikson's psychosocial development theory, particularly the identity versus role confusion stage. These results underscore the need for multilevel interventions targeting family support, community resources, and health behaviors to promote adolescent mental health, especially for vulnerable immigrant populations.[41]

5. LIMITATIONS

This study has several limitations. First, the cross-sectional design precludes the determination of temporal relationships between risk factors and mental health outcomes. Second, many immigrants in Iran lack legal status, potentially deterring healthcare usage until advanced disease stages; this could artificially lower observed prevalence. Third, without unique identifiers, tracking illegal immigrant health service utilization is challenging, further compounding data constraints. Fourth, linguistic and cultural barriers in immigrant research can limit result validity and generalizability. Additional limitations include reliance on clinician-documented diagnoses in the health record database rather than standardized clinical assessments. Future research with longitudinal follow-up, multilingual assessment tools, and ethnographic approaches is warranted to address these limitations. Nonetheless, this study offers important initial evidence on a difficult-to-reach group and identifies priority areas for intervention and support.

6. CONCLUSION

This large cross-sectional study revealed comparable mental disorder prevalences of 13% in Iranian and immigrant youth in Mashhad. Anxiety, depression, hyperkinetic, epileptic, and intellectual disabilities were the most common disorders. Complex social, behavioral, and medical factors predicted illness, including child adversity, family instability, low activity, and comorbidities. Notably, Iranian and immigrant adolescents demonstrated similar mental health profiles, aligning with some research showing resilience in displaced groups. However, immigrants exhibited advantages across certain domains, emphasizing population heterogeneity.

Ultimately, this work highlights the need for early, culturally-informed screening and trauma-focused services to promote immigrant mental health. The findings also underscore the shared benefits of supportive environments for all adolescents. Future studies should adopt longitudinal designs to establish causality between risk factors and mental health outcomes, use culturally validated diagnostic tools for immigrant populations, and explore resilience factors (e.g., social support and cultural identity) that may mitigate risks. Qualitative research can further elucidate the lived experiences of immigrant adolescents, informing trauma-informed, culturally sensitive interventions.

ACKNOWLEDGMENTS

We extend our gratitude to the Health Deputy of Mashhad University of Medical Sciences for assisting us in data collection.

FUNDING

This research was supported by Mashhad University of Medical Sciences (grant number: 4012092).

CONFLICTS OF INTEREST

The authors declare no competing interests.

AUTHOR CONTRIBUTIONS

Conceptualization: Amin Moradi, Masoumeh Sadeghi
Data curation: Amin Moradi, Mohammad Taghi Shakeri
Methodology: Fateme Nikbakht, Ehsan Mosafarkhani
Supervision: Masoumeh Sadeghi
Writing–original draft: Fateme Nikbakht, Ehsan Mosafarkhani
Writing–review & editing: Amin Moradi

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval was obtained from Mashhad University of Medical Sciences (approval code: IR.MUMS.FHMPM.REC.1401.218). The study utilized secondary data that were anonymized.

CONSENT FOR PUBLICATION

Not applicable.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author on reasonable request.

Submitted: 11 April 2025; Revision received: 11 August 2025; Accepted: 19 August 2025; Published: 08 September 2025

REFERENCES

1. Kaufman JA, Salas-Hernández LK, Komro KA, Livingston MD. Effects of increased minimum wages by unemployment rate on suicide in the USA. *J Epidemiol Community Health*. 2020;74(3):219-24. doi: 10.1136/jech-2019-212981

2. Bennett S, Walkup JT. *Anxiety Disorders in Children and Adolescents: Epidemiology, Pathogenesis, Clinical Manifestations, and Course*. United States: Up to Date; 2019.

3. Maghsoudi J, Yazdani M, Mehrabi T. The effect of acquiring life skills through humor on social adjustment rate of the female students. *Iran J Nurs Midwifery Res*. 2010;15(4):195-201.

4. Talepasand S, Mohammadi MR, Alavi SS, *et al*. Psychiatric disorders in children and adolescents: Prevalence and sociodemographic correlates in Semnan Province in Iran. *Asian J Psychiatry*. 2019;40:9-14. doi: 10.1016/j.ajp.2019.01.007

5. Jesuthasan J, Sönmez E, Abels I, *et al*. Near-death experiences, attacks by family members, and absence of health care in their home countries affect the quality of life of refugee women in Germany: A multi-region, cross-sectional, gender-sensitive study. *BMC Med*. 2018;16:15. doi: 10.1186/s12916-017-1003-5

6. Zbidat A, Georgiadou E, Borho A, Erim Y, Morawa E. The perceptions of trauma, complaints, somatization, and coping strategies among Syrian refugees in Germany-a qualitative study of an at-risk population. *Int J Environ Res Public Health*. 2020;17(3):693. doi: 10.3390/ijerph17030693

7. Peyre H, Hoertel N, Stordeur C, *et al*. Contributing factors and mental health outcomes of first suicide attempt during childhood and adolescence: Results from a nationally representative study. *J Clin Psychiatry*. 2017;78(6):e622-e630. doi: 10.4088/JCP.16m10876

8. Rosenthal T. Immigration and acculturation: Impact on health and well-being of immigrants. *Curr Hypertens Rep*. 2018;20(8):70. doi: 10.1007/s11906-018-0872-0

9. Blackmore R, Gray KM, Boyle JA, *et al*. Systematic review and meta-analysis: The prevalence of mental illness in child and adolescent refugees and asylum seekers. *J Am Acad Child Adolesc Psychiatry*. 2020;59(6):705-714. doi: 10.1016/j.jaac.2019.11.011

10. Riahi A, Hariri N, Nooshinfard F. Study of health Information needs and barriers to access among afghan and iraqi immigrants in Iran. *J North Khorasan Univ Med Sci*. 2016;7(3):597-610.

11. Remoue Gonzales S, Higgs J. Perspectives on Integrated Behavioral Health in pediatric care with immigrant children and adolescents in a Federally Qualified Health Center in Texas. *Clin Child Psychol Psychiatry*. 2020;25(3):625-635. doi: 10.1177/1359104520914724

12. Norouzi M, Amiri Z, Farkhani EM, Hoseini SJ, Khosravi Asl T. Advancing healthcare infrastructure: The features of Iran's sina electronic health record system. *Epidemiol Health System J*. 2024;11(2):48-54.

13. Cotton SM, Menssink J, Filia K, *et al*. The psychometric characteristics of the Kessler Psychological Distress Scale (K6) in help-seeking youth: What do you miss when using it as an outcome measure? *Psychiatry Res*. 2021;305:114182. doi: 10.1016/j.psychres.2021.114182

14. O'Hare K, Watkeys O, Dean K, *et al*. Childhood schizotypy and adolescent mental disorder. *Schizophr Bull*. 2024;50(1):69-77. doi: 10.1093/schbul/sbad132

15. Georgiades K, Boyle MH, Duku E. Contextual influences on children's mental health and school performance: The moderating effects of family immigrant status. *Child Dev*. 2007;78(5):1572-1591. doi: 10.1111/j.1467-8624.2007.01084.x

16. Back Nielsen M, Carlsson J, Køster Rimvall M, Petersen JH, Norredam M. Risk of childhood psychiatric disorders in children of refugee parents with post-traumatic stress disorder: A nationwide, register-based, cohort study. *Lancet Public Health*. 2019;4(7):e353-e359. doi: 10.1016/S2468-2667(19)30077-5

17. Amiri S, Mohammadi MR, Ahmadi N, *et al*. Prevalence of psychiatric disorders among children and adolescents in the East Azerbaijan Province, Tabriz, Iran in 2017. *Iran J Psychiatry Behav Sci*. 2019;13(4):e88594. doi: 10.5812/ijpbs.88594

18. Mojahed A, Rigi Kooteh B, Mohammadi MR, *et al*. Prevalence of mental disorders among children and teenagers in Sistan and Baluchestan Province, Iran. *Casp J Health Res*. 2021;6(3):91-100. doi: 10.32598/CJHR.6.3.5

19. Mohammadi MR, Ahmadi N, Khaleghi A, *et al*. Prevalence and correlates of psychiatric disorders in a national survey of Iranian children and

adolescents. *Iran J Psychiatry*. 2019;14(1):1-15. doi: 10.18502/ijps.v14i1.418

20. Hafekost J, Lawrence D, Boterhoven de Haan K, *et al*. Methodology of young minds matter: The second Australian child and adolescent survey of mental health and wellbeing. *Aust N Z J Psychiatry*. 2016;50(9):866-875. doi: 10.1177/0004867415622270

21. Inkelis SM, Ancoli-Israel S, Thomas JD, Bhattacharjee R. Elevated risk of depression among adolescents presenting with sleep disorders. *J Clin Sleep Med*. 2021;17(4):675-683. doi: 10.5664/jcsm.8996

22. Yu Y, Mo PKH, Zhang J, Li J, Lau JTF. Maladaptive cognitions, loneliness, and social anxiety as potential moderators of the association between Internet gaming time and Internet gaming disorder among adolescent Internet gamers in China. *Addict Behav*. 2022;129:107239. doi: 10.1016/j.addbeh.2022.107239

23. David OA, Predatu R, Cardoș RAI. Effectiveness of the REThink therapeutic online video game in promoting mental health in children and adolescents. *Internet Interv.* 2021;25:100391. doi: 10.1016/j.invent.2021.100391

24. Mazza C, Ricci E, Marchetti D, *et al*. How personality relates to distress in parents during the COVID-19 lockdown: The mediating role of child's emotional and behavioral difficulties and the moderating effect of living with other people. *Int J Environ Res Public Health*. 2020;17(17):6236. doi: 10.3390/ijerph17176236

25. Wicks S, Hjern A, Gunnell D, Lewis G, Dalman C. Social adversity in childhood and the risk of developing psychosis: A national cohort study. *Am J Psychiatry*. 2005;162(9):1652-1657. doi: 10.1176/appi.ajp.162.9.1652

26. Mutumba M, Bauermeister JA, Harper GW, *et al*. Psychological distress among Ugandan adolescents living with HIV: Examining stressors and the buffering role of general and religious coping strategies. *Global Public Health*. 2017;12(12):1479-1491. doi: 10.1080/17441692.2016.1170871

27. Melkam M, Nenko G, Demilew D. Common mental disorders and associated factors among high school students in Debre Markos Town, Northwest Ethiopia: An institutional-based cross-sectional study. *BMJ Open*. 2022;12(11):e059894. doi: 10.1136/bmjopen-2021-059894

28. Bronsard G, Alessandrini M, Fond G, *et al*. The prevalence of mental disorders among children and adolescents in the child welfare system: A systematic review and meta-analysis. *Medicine (Baltimore)*. 2016;95(7):e2622. doi: 10.1097/MD.0000000000002622

29. Mohammadi MR, Mostafavi SA, Hooshyari Z, Khaleghi A, Ahmadi N. Body mass index status across different psychiatric disorders in a national survey amongst children and adolescents: To identify the role of gender. *Iran J Psychiatry*. 2019;14(4):253-264. doi: 10.18502/ijps.v14i4.1975

30. Gaskin JL, Pulver AJ, Branch K, Kabore A, James T, Zhang J. Perception or reality of body weight: Which matters to the depressive symptoms. *J Affect Disord*. 2013;150(2):350-355. doi: 10.1016/j.jad.2013.04.017

31. Guan Q, Huan F, Wang Y, *et al*. The relationship between secondhand smoking exposure and mental health among never-smoking adolescents in school: Data from the Global School-based Student Health Survey. *J Affect Disord*. 2022;311:486-493. doi: 10.1016/j.jad.2022.05.121

32. Bandiera FC, Richardson AK, Lee DJ, He JP, Merikangas KR. Secondhand smoke exposure and mental health among children and adolescents. *Arch Pediatr Adolesc Med.* 2011;165(4):332-338. doi: 10.1001/archpediatrics.2011.30

33. Rizk Y, Hoteit R, Khater B, Naous J. Psychosocial wellbeing and risky health behaviors among Syrian adolescent refugees in South Beirut: A study using the HEEADSSS interviewing framework. *Front Psychol*. 2023;14:1019269. doi: 10.3389/fpsyg.2023.1019269

34. Afifi TO, MacMillan HL, Boyle M, Taillieu T, Cheung K, Sareen J. Child abuse and mental disorders in Canada. *CMAJ*. 2014;186(9):E324-E332. doi: 10.1503/cmaj.131792

35. Blazquez A, Castro-Fornieles J, Baeza I, Morer A, Martinez E, Lazaro L. Differences in psychopathology between immigrant and native adolescents admitted to a psychiatric inpatient unit. *J Immigr Minor Health*. 2015;17(6):1715-1722. doi: 10.1007/s10903-014-0143-3

36. Zlotnick C, Birenbaum-Carmeli D, Goldblatt H, Dishon Y, Taychaw O, Shadmi E. Adolescent immigrants, the impact of gender on health status. *Eur J Public Health*. 2017;27(3):453-459. doi: 10.1093/eurpub/ckw208

37. Kwak K, Rudmin F. Adolescent health and adaptation in Canada: Examination of gender and age aspects of the healthy immigrant effect. *Int J Equity Health*. 2014;13:103. doi: 10.1186/s12939-014-0103-5

38. Kwak K. An evaluation of the healthy immigrant effect with adolescents in Canada: Examinations of gender and length of residence.

Soc Sci Med. 2016;157:87-95. doi: 10.1016/j.socscimed.2016.03.017

39. Liu Y, Maltais NS, Milner-Bolotin M, Chachashvili-Bolotin S. Investigating adolescent psychological wellbeing in an educational context using PISA 2018 Canadian data. *Front Psychol*. 2024;15:1416631. doi: 10.3389/fpsyg.2024.1416631

40. Rose T, Lambert S, Liu C, *et al*. Socio-ecological domains and adolescent mental health: An application of the dual-factor model. *J Res Adolesc*. 2025;35(2):e70029. doi: 10.1111/jora.70029

41. Paul RA. Identity and community: Erikson reconsidered. *Psychoanal Q*. 2023;92(3):377-405. doi: 10.1080/00332828.2023.2267527