Alqalam Journal of Medical and Applied Sciences. 2026;9(8):2554-2563
https://doi.org/10.54361/ajmas.269831

Original article

Mental Health Burden and Sex Disparities in Libyan Secondary School Students: Findings from a Cross-Sectional Survey

Hinda Ganbur[1,2]*, Miluda Elhamadi[3]

[1]National Centre for Disease Control, Tripoli, Libya
[2]Public Health Department, Faculty of Medical Technology, University of Tripoli, Libya
[3]Family and Community Medicine Department, University of Tripoli, Libya
Email: H.ganbur@outlook.com

Abstract
Mental health problems and related risk behaviours among adolescents are major public health concerns. These behaviours can negatively affect physical, psychological, and social well-being. This study assessed emotional distress, suicidal behaviours, tobacco use, violence-related outcomes, and bullying among Libyan secondary school students, with attention to sex differences in Tripoli, Libya. A cross-sectional study was conducted across 17 public and 3 private secondary schools in Souq Al Juma municipality, Tripoli, in 2023. Data on mental health and sedentary behaviour were collected using a validated Arabic-version modified Global School-based Student Health Survey (GSHS) through face-to-face interviews and self-administered questionnaires. Data analysis was performed using SPSS version 26, employing both descriptive and inferential statistical methods. Sex differences were assessed using chi-square tests, with statistical significance set at P<0.05. Emotional and cognitive distress was frequent. Worry affecting appetite was reported by 29.7% of students; feeling down, depressed, or hopeless by 32.6%; nervousness or uncontrollable worrying by 25.8%; and difficulty concentrating by 32.1%; females reported significantly higher levels than males for all symptoms (P=0.001). Suicide attempts were reported by 11.0% of students, and 16.6% reported self-harm without suicidal intent. Tobacco use was common, with 28.1% ever smoking cigarettes, 13.3% smoking in the previous 30 days, 23.2% trying e-cigarettes, and 69.3% reporting second-hand smoke exposure; these behaviours were significantly more common among males (P=0.001). In addition, 12.2% sustained serious injuries, 22.5% were involved in physical fighting at school, and 43.6% reported cyberbullying, with males more frequently affected by violence-related outcomes. The findings demonstrate a substantial burden of mental health problems and health-risk behaviours among students. School-based interventions targeting mental health promotion, tobacco prevention, violence reduction, and bullying prevention are recommended.
Keywords: Mental Health, Adolescents, Secondary School Students, Libya, Psychological Distress.

Introduction

Mental disorders among children and adolescents constitute a major global public health concern [1]. Approximately one in seven adolescents aged 10-19 years experiences a mental disorder, while this age group represents nearly one-sixth of the global population [2,3]. These conditions frequently remain unrecognised and untreated, with affected adolescents facing an increased risk of social exclusion, stigma, discrimination, educational difficulties, risk-taking behaviours, physical health problems, and human rights violations [1].

Adolescence is a critical developmental period during which mental disorders and health-risk behaviours commonly emerge, creating a substantial burden for school-aged populations. Depression, anxiety, self-harm, suicidal behaviour, substance use, including tobacco use and involvement in violence or bullying are important concerns during this period [4-6]. These problems may co-occur and are influenced by sex, sociocultural context and exposure to environmental stressors [5,6]. Conversely, school-based mental health education, supportive relationships and other protective factors may promote resilience and reduce adverse outcomes [6-8]. Assessing the prevalence and distribution of these conditions within local settings is therefore essential for guiding prevention strategies and developing contextually appropriate school-based interventions.

The burden of mental disorders is particularly concerning in low- and middle-income countries, where conflict, forced migration, socioeconomic hardship, infrastructure destruction, and unemployment may increase exposure to psychological stressors [9-11]. These challenges are especially relevant in Arabic-speaking countries, where reported estimates of mental health conditions range from 11% to 40.1% [9]. The Eastern Mediterranean Region has experienced repeated and protracted humanitarian emergencies, and its overall age-standardised prevalence of mental disorders has been estimated at approximately 14.35%, exceeding the corresponding global estimate [10]. Populations affected by conflict demonstrate substantially elevated levels of mental disorders; a systematic review and meta-analysis estimated that approximately 22.1% of people living in conflict-affected settings experience a mental disorder, including depression, anxiety disorders, post-traumatic stress disorder, bipolar disorder or schizophrenia [11]. Conflict and humanitarian emergencies may also increase psychological distress through exposure to violence, forced displacement, family separation, poverty, loss of livelihoods and disruption of health and social-support systems [12].

Libyan adolescents face a distinctive combination of risks associated with prolonged armed conflict, political instability, economic hardship, displacement and disruption of family, school and social-support networks. These conditions may increase vulnerability to depression, anxiety, post-traumatic stress disorder and behavioural problems during adolescence. In Libya, modelled estimates from the Global Burden of Disease Study 2019 indicate that mental disorders

Received: *12-06-2026 - **Accepted:** 10-08-2026 - **Published:** 19-08-2026*

account for approximately 18% of prevalent health conditions among individuals aged 10-19 years, with anxiety and depressive disorders among the principal concerns in older adolescents [13]. Conflict-related adversity may also contribute to psychological distress through exposure to violence, insecurity, displacement, unemployment, family disruption and interruptions to education [14,15].

However, access to adolescent mental health services in Libya remains limited. The health-care system has been weakened by prolonged political instability and recurrent conflict, contributing to insufficient specialist capacity, geographical inequalities in service availability and limited integration of mental health and psychosocial support into primary health care [14]. Mental health stigma may further discourage help-seeking and contribute to under-recognition, underdiagnosis and undertreatment [12]. Consequently, school-based mental health programmes, community-based psychosocial services and referral pathways for children and adolescents remain insufficient and require strengthening within a coordinated, culturally appropriate national mental health system [12-16].

Therefore, this study aimed to estimate the prevalence and severity of mental health problems among secondary school students in the municipality of Souq Al-Jumaa, Tripoli, Libya, and to assess sex differences in the overall mental health burden in this population, providing a clearer basis for understanding the local burden.

Methods

Study Design

This study is a cross-sectional, analytical, and quantitative design conducted in the municipality of Souq Al-Jumaa in Tripoli, across the public and private sectors. Souq Al-Jumaa municipality is located on the east coast of Tripoli, Libya. It is bordered to the west by the municipality of Tripoli Centre, to the south by the municipality of Ain Zara, to the east by the municipality of Tajoura, and to the north by the coastal road of Shatt. It is considered one of the largest areas in Tripoli, with a total area of 44,654,167,624 square meters; it contains 17 localities, and its population is 405,670.

The representative sample of students met the following inclusion criteria: students aged 15 to 19 years in the targeted schools; males and females of any nationality who agreed to participate and were present on the day of data collection. Individuals who did not meet these criteria were excluded.

Study Population

A two-stage stratified random sampling design was employed to generate data representative of the entire student population in Souq Al-Jumaa municipality, Tripoli, Libya. In the first stage, schools were selected using probability proportional to enrolment size. Subsequently, in the second stage, randomly selected students aged 15 to 19 years who met eligibility criteria for participation were drawn from classes based on the predetermined sample size. The number of students recruited from each school was determined proportionally based on the percentage of the total student population enrolled in that school. The sample size was calculated using Epi Info version 7, with a confidence level set at 95% and an alpha margin of error of 5%. This calculation yielded a required sample size of 384 students; however, to account for a potentially low response rate, 460 students were initially approached for participation.

Data Collection

Data were collected in March 2023 using a modified, pretested GSHS Arabic-translated questionnaire containing core-expanded and country-specific questions, combined to form a questionnaire that could be administered during one regular class period by interviewing students directly. The questionnaire contained 3 sections. The first section includes questions concerning the name of the school, date of visit, and name of the investigator; the second section deals with sociodemographic characteristics such as year of birth, gender, educational level of father and mother, occupation of father and mother, family size, and class grade. The third section includes the adapted expanded questionnaire modules that address the leading causes of mental disorders among children and adults worldwide. It comprises mental health, tobacco use, violence and unintentional injuries.

A pilot study was conducted at Tripoli Secondary School in May 2022 to evaluate the feasibility and applicability of the study instruments. A random sample of 20 students who were not part of the main study was selected, and study questionnaires were distributed to participants. This preliminary phase was designed to assess the feasibility of the study protocol, determine the time required for students to complete the entire questionnaire, and examine the practical applicability of the study tools before full implementation.

Statistical Analysis

Data were collected and checked for accuracy, completeness and consistency. Then summarised, coded and analysed using the Statistical Package for the Social Sciences (SPSS) version 26 (SPSS Inc., Chicago, IL, USA). Descriptive statistics, including frequencies, percentages, mean, and standard deviation (SD), were used for summarising the data and outcome variables. Categorical data were compared by using the Chi-square test and Fisher's exact test if appropriate. Quantitative data were compared using an independent T-test. A P-value of less than 0.05 was considered statistically significant.

Ethical standards disclosure

Permission was obtained from the school education authorities. Also, ethical approval was obtained from the Libyan Medical Board Ethics Committee. The objectives of the study, expected benefits and types of information obtained were

Received: *12-06-2026 -* ***Accepted:*** *10-08-2026 -* ***Published:*** *19-08-2026*

explained to all participants and verbal consent from all participants' parents and written informed consent from all participants were obtained. The data collection tools were anonymous, and data confidentiality was maintained throughout the study.

Results

Sociodemographic Characteristics of Participants

Error! Reference source not found. shows the sociodemographic characteristics of the study participants. Slightly more than half of the respondents were female, 227 (53.2%), while 200 (46.8%) were male. The majority of students attended public schools, 367 (85.9%), whereas 60 (14.1%) were enrolled in private schools. Concerning educational level, 275 participants (64.4%) were in upper secondary school, and 152 (35.6%) were in lower secondary school.

For paternal education, nearly half of the fathers, 203 (47.6%), had a university or postgraduate level of education, followed by secondary education, 121 (28.3%). Primary education was reported for 38 fathers (8.9%), while 65 (15.2%) had no formal education. Similarly, nearly half of the mothers, 203 (47.6%), had a university or postgraduate level of education, followed by secondary education, 124 (29.0%). A total of 67 mothers (15.7%) had no formal education, and 33 (7.7%) had primary education. Most participants (340; 79.6%) reported living in households with more than five family members, while 87 (20.4%) lived in households with five or fewer family members.

Table 1: Demographic criteria of secondary school students at Souq Al-Jumaa Municipality, 2022. (n=427)

Item	Frequency	(%)
Type of school:		
- Public	367	(85.9)
- Private	60	(14.1)
Gender:		
- Male	Male	Male
- Female	Female	Female
Age (mean ± SD) years		16.97 ± 0.86
Education Levels:		
- Lower secondary school	152	(35.6)
- Upper secondary school	275	(64.4)
Father's education:		
- Illiterate	65	(15.2)
- Primary	38	(8.9)
- Secondary	121	(28.3)
- University/ Postgraduate	203	(47.6)
Mother's education:		
- Illiterate	67	(15.7)
- Primary	33	(7.7)
- Secondary	124	(29.0)
- University/ Postgraduate	203	(47.6)
Family members:		
- 5 and less	87	(20.4)
- > 5	340	(79.6)

Mental Health Status

Feelings and concerns

Table 2 shows that emotional and cognitive distress was common among secondary school students, with females consistently reporting higher levels of concern than males. Statistically significant sex differences were observed for all assessed symptoms, including worry interfering with eating, depressive feelings, nervousness or anxiety, and difficulty concentrating (P=0.001 for all comparisons).

Across the sample, 29.7% of students reported worry severe enough to affect appetite most of the time or always, 32.6% reported feeling down, depressed, or hopeless, 25.8% reported nervousness or uncontrollable worrying, and 32.1% reported difficulty focusing on homework or other tasks. In each case, the burden was greater among female students, indicating a consistent pattern of poorer mental health among girls compared with boys.

Received: *12-06-2026 -* ***Accepted:*** *10-08-2026 -* ***Published:*** *19-08-2026*

Table 2: Feelings and concerns among secondary school students in Souq Al Juma municipality, 2022, by sex. (n=427)

Item	Total (n=427)		Male (n=200)		Female (n=227)		P value
	No.	%	No.	%	N.	%	
Being so worried about something that you could not eat, did not feel hungry, or ate too much during the past 12 months.							
Never or rarely	197	(46.1)	132	(66)	65	(28.6)	
Sometimes.	103	(24.2)	39	(19.5)	64	(28.2)	**0.001**
Most of the time and always	127	(29.7)	29	(14.5)	98	(43.2)	
Felt down, depressed, or hopeless, or had little interest in or got little pleasure from doing things during the past 12 months.							
Never or rarely	156	(36.5)	100	(50)	56	(24.7)	
Sometimes.	132	(30.9)	55	(27.5)	77	(33.9)	**0.001**
Most of the time and always	139	(32.6)	45	(22.5)	94	(41.4)	
Felt nervous, anxious, or not able to stop or control worrying during the past 12 months.							
Never or rarely	215	(50.4)	132	(66)	83	(36.6)	
Sometimes.	102	(23.8)	42	(21)	60	(26.4)	**0.001**
Most of the time and always	110	(25.8)	26	(13)	84	(37)	
Students who had a hard time staying focused on homework or other tasks during the past 12 months.							
Never or rarely	188	(44)	118	(59)	70	(30.8)	
Sometimes.	102	(23.9)	39	(19.5)	63	(27.8)	**0.001**
Most of the time and always	137	(32.1)	43	(21.5)	94	(41.4)	

Suicide attempts and self-harm:

Table 3 shows that 47 students (11.0%) reported having attempted suicide. Although the prevalence was slightly higher among females (27, 11.9%) than males (20, 10.0%), this difference was not statistically significant (p=0.533). Among those who reported a suicide attempt, 16 students (3.7% of the total sample) indicated that the attempt resulted in injury, poisoning, or overdose requiring treatment by a doctor or nurse. This outcome was more frequent among females (13; 5.7%) than males (3; 1.5%), but the difference did not reach statistical significance (p=0.052). In addition, only 13 students (3.0%) reported receiving help afterwards from a doctor, counsellor, therapist, or hotline to prevent another attempt, with no significant sex difference (p=0.218).

Self-harm without suicidal intent was reported by 71 students (16.6%), with a higher proportion among females, 43 (18.9%), than males, 28 (14.0%); however, this difference was also not statistically significant (p=0.107). Regarding school-based mental health education, 50 students (11.7%) reported being taught how to manage anger during the school year, and this was significantly more common among females, 38 (16.7%), than males, 12 (6.0%) (p=0.003). Similarly, 22 students (5.2%) reported receiving instruction on the signs of depression and suicidal behaviours, with females, 17 (7.5%), reporting this more often than males, 5 (2.5%) (p=0.031). In contrast, 49 students (11.5%) reported receiving education on healthy ways to manage stress during the school year. Overall, the findings indicate a notable burden of suicidal behaviour and self-harm among secondary school students, particularly self-harm without suicidal intent. Although females generally reported higher proportions of suicidal attempts, injury-related attempts, and self-harm, these sex differences were not statistically significant. The only statistically significant sex differences were related to school-based mental health education, with females more likely than males to report being taught about anger management and signs of depression or suicidal behaviour.

Tobacco use among students

Table 4 shows that tobacco use was common among the study participants. Overall, 120 students (28.1%) reported cigarette smoking, including 25 (5.9%) who initiated smoking before the age of 10 years and 95 (22.2%) who started at age 10 years or older. Cigarette smoking was significantly associated with sex (p=0.001), with higher prevalence among males than females. Most students, 370 (86.7%), did not smoke cigarettes during the 30 days preceding the survey. In contrast, 57 students (13.3%) reported smoking cigarettes on one or more days during the past 30 days, including 54 males (27.0%) and 3 females (1.3%). This sex difference was statistically significant (p=0.001). In addition, 55 students (12.9%) reported use of other forms of tobacco on one or more days during the past 30 days. This was significantly more common among males (50; 25.0%) than females (5; 2.2%) (p=0.001).

Received: *12-06-2026 -* ***Accepted:*** *10-08-2026 -* ***Published:*** *19-08-2026*

Table 3: Suicide attempts and self-harm among secondary school students at Souq Al Juma municipality, 2022, according to sex. (n=427)

Items	Total (n=427)		Male (n=200)		Female (n=227)		P value
	No.	%	No.	%	No.	%	
Students who attempt suicide.	47	(11)	20	(10)	27	(11.9)	0.533
Any suicidal attempt resulted in injury, poisoning, or overdose that had to be treated by a doctor or nurse during the past 12 months.	16	(3.7)	3	(1.5)	13	(5.7)	0.052
Students who got help after a suicidal attempt from a doctor, counsellor, therapist or hotline to help in prevention of another attempt during the past 12 months.	13	(3.0)	3	(1.5)	10	(4.4)	0.218
Students who did something to purposely hurt themselves without wanting to die, such as cutting or burning on purpose during the past 12 months.	71	(16.6)	28	(14)	43	(18.9)	0.171
Students who were taught in school classes how to manage anger during this school year.	50	(11.7)	12	(6)	38	(16.7)	**0.003**
Students who were taught in school classes about the signs of depression and suicidal behaviors during this school year.	22	(5.2)	5	(2.5)	17	(7.5)	**0.031**
Students who were taught in school classes what to do if a friend was thinking of suicide during this school year.	20	(4.7)	9	(4.5)	11	(4.8)	0.789
Students who were taught in any school classes how to handle stress in healthy ways during this school year.	49	(11.5)	12	(6)	37	(16.3)	**0.002**

A total of 99 students (23.2%) reported ever trying e-cigarettes, including 86 males (43.0%) and 13 females (5.7%), again showing a statistically significant sex difference (p=0.001). About cessation, only 50 students (11.7%) reported trying to stop smoking during the previous 12 months, and all of them were male (50; 25.0%), with no female reporting quit attempts (p=0.001). Exposure to second-hand smoke was also high, with 296 students (69.3%) reporting exposure on one or more days during the previous seven days. This exposure was significantly more common among males (162; 81.0%) than females (134; 59.0%) (p=0.001). Finally, only 125 students (29.3%) reported receiving classroom teaching about the dangers of tobacco use during the current school year.

Table 4: Tobacco use among secondary school students at Souq Al-Jumaa municipality, 2022 according to sex. (n=427)

Item	Total (n=427)		Male (n=200)		Female (n=227)		P value
	N0.	%	No.	%	No.	%	
Age when you first smoked cigarettes							
I didn't smoke cigarettes	307	(71.9)	102	(51)	205	(90.3)	**0.001**
< 10 years	25	(5.9)	18	(9)	7	(3.1)	
≥ 10 years	95	(22.2)	80	(40)	15	(6.6)	
The number of days you smoked cigarettes during the past 30 days							
Zero days	370	(86.7)	146	(73)	224	(98.7)	**0.001**
One or more days	57	(13.3)	54	(27)	3	(1.3)	
The number of days you used other types of tobacco during the past 30 days							
Zero days	372	(87.1)	150	(75)	222	(97.8)	**0.001**
One or more days	55	(12.9)	50	(25)	5	(2.2)	
Trying an electronic cigarette or e-cigarette.							
Never	328	(76.8)	114	(57)	214	(94.3)	**0.001**
Yes	99	(23.2)	86	(43)	13	(5.7)	

Received: *12-06-2026 -* ***Accepted:*** *10-08-2026 -* ***Published:*** *19-08-2026*

Trying to quit smoking during the past 12 months.							
Did not smoke a cigarette during the past 12 months	347	(81.3)	134	(67)	213	(92.8)	**0.001**
No	30	(7)	16	(8)	14	(6.2)	
Yes	50	(11.7)	50	(25)	0	(0)	
Number of days someone smoked in your presence during the past 7 days.							**0.001**
Zero days	131	(30.7)	38	(19)	93	(41)	
One day or more	296	(69.3)	162	(81)	134	(59)	
Being taught in any class about the danger of tobacco use during this school year.							**0.019**
No	279	(65.3)	125	(62.5)	154	(67.8)	
Yes	125	(29.3)	69	(34.5)	56	(24.7)	
I do not know	23	(5.4)	6	(3)	17	(7.5)	

Violence, Unintentional Injury and bullying:

Table 5 shows that 52 students (12.2%) sustained a serious injury requiring medical care or resulting in absence from normal activities in the previous 12 months, with a significantly higher prevalence among males than females, 36 (18.0%) versus 16 (7.1%) (P=0.001). Similarly, 96 students (22.5%) reported involvement in physical fighting on school property, and this behaviour was significantly more common among males, 69 (34.5%), than females, 27 (11.9%) (P=0.001).

With respect to bullying, 199 students (46.6%) reported bullying another student on school property, although the difference between males, 103 (51.5%), and females, 96 (42.3%), was not statistically significant (P=0.057). Bullying outside school property was reported by 200 students (46.8%) and was significantly more frequent among males, 107 (53.5%), than females, 93 (41.0%) (P=0.01). Cyberbullying was reported by 186 students (43.6%), with a significantly higher prevalence among males, 104 (52.0%), than females, 82 (36.1%) (P=0.01).

Table 5: Violence, Unintentional Injury and bullying among secondary school students at Souq Al-Jumaa Municipality, 2022, according to sex. (n=427)

Items	Total (n=427)		Male (n=200)		Female (n=227)		p-value
	No.	%	No.	%	No.	%	
Students who were seriously injured and had to be treated by a doctor or nurse or missed their usual activities during the past 12 months.							
Zero times.	375	(87.8)	164	(82.0)	211	(93.0)	**0.001**
One or more times.	52	(12.2)	36	(18.0)	16	(7.1)	
Students who were involved in a physical fight on school property during the past 12 months.							
Zero times.	331	(77.5)	131	(65.5)	200	(88.1)	**0.001**
One or more times.	96	(22.5)	69	(34.5)	27	(11.9)	
Students who bullied someone on school property during the past 12 months.	199	(46.6)	103	(51.5)	96	(42.3)	0.057
Students who bullied someone when you were not on school property during the past 12 months.	200	(46.8)	107	(53.5)	93	(41.0)	**0.010**
Students who cyber bullied someone During the past 12 months.	186	(43.6)	104	(52.0)	82	(36.1)	**0.001**

Discussion

The present study demonstrates a substantial burden of emotional distress, suicidal behaviour, tobacco use, and violence-related exposure among Libyan secondary school students. The high prevalence of worry, depressed mood, nervousness, and difficulty concentrating suggests that psychological distress is common during adolescence and may already be affecting daily functioning and school performance. The consistent female excess in internalising symptoms is in line with previous evidence showing that adolescent girls report higher levels of depression and anxiety than boys, particularly in school-based surveys from low- and middle-income countries [2,3,17,18]. Although these symptoms were measured using

Received: *12-06-2026 -* ***Accepted:*** *10-08-2026 -* ***Published:*** *19-08-2026*

self-reported indicators rather than clinical diagnoses, the observed pattern remains important because even subclinical distress in adolescence is associated with impaired academic attainment and later psychiatric morbidity [19-21].

Suicidal behaviour and self-harm were also notable. The overall prevalence of suicide attempts in this study was higher than the pooled 12-month estimates reported in multinational school-based analyses from low- and middle-income countries, where suicidal ideation is common but attempts are generally less frequent than ideation [22,23]. The relatively high proportion of self-harm without suicidal intent is particularly concerning and may indicate maladaptive coping, emotional dysregulation, or limited access to supportive services [24,25]. The lack of a statistically significant sex difference in suicide attempts contrasts with the female predominance often reported for suicidal ideation, suggesting that broader contextual factors may influence attempts in this population [26]. The low proportion of students who received help after a suicide attempt underscores a critical service gap and is consistent with evidence that post-attempt care is often weak or inaccessible in adolescent populations in low-resource settings [27-29].

The findings on tobacco use are also alarming. Ever-smoking, recent cigarette use, e-cigarette experimentation, and exposure to second-hand smoke were common, with significantly higher prevalence among males. This sex pattern is consistent with youth tobacco surveillance from comparable settings, where male adolescents typically report greater use of cigarettes and other tobacco products [30-33]. The early initiation reported by some students is particularly concerning because younger age at onset is associated with stronger nicotine dependence and a higher likelihood of long-term smoking. In addition, the high exposure to second-hand smoke suggests that tobacco control cannot focus only on individual behaviour but must also address household and community norms [34,35].

The limited proportion of students receiving classroom education on the harms of tobacco indicates missed prevention opportunities, despite strong evidence that school-based tobacco education can reduce initiation when sustained and well implemented [36,37].

Violence and bullying were similarly widespread. Serious injury and physical fighting were more common among males, which is consistent with previous adolescent studies showing greater involvement of boys in overt aggression and injury-prone behaviour [38-40]. Bullying, including cyberbullying, affected a large proportion of students in both sexes, indicating that peer aggression is not confined to the school environment. This finding is important because bullying is strongly associated with depression, anxiety, self-harm, and suicidal ideation [41,42]. The presence of both school-based and online bullying suggests that interventions should be comprehensive, combining school climate improvement, teacher training, parent engagement, and digital safety education [43-45].

Taken together, the data suggest clustering of mental distress and risk behaviours rather than isolated problems. This clustering supports integrated school health approaches that combine mental health screening, counselling, suicide prevention, tobacco control, and anti-bullying strategies. International evidence indicates that school climate and supportive adult relationships are key protective factors for adolescent mental health, while targeted psychosocial interventions can reduce suicidal ideation and improve functioning [46-48]. In this context, strengthening school counselling services and referral pathways may be particularly valuable, especially where specialist child and adolescent mental health services are limited.

Limitations

Several limitations should be considered when interpreting these findings. First, the cross-sectional design precludes establishing causal relationships or determining the temporal sequence between mental health symptoms and risk behaviours. Second, the use of self-reported data may have introduced recall and social-desirability biases, potentially resulting in underreporting of stigmatised behaviours, such as suicide attempts and smoking among female students. Third, the representativeness of the sample may have been affected if schools or students with particular characteristics were under- or overrepresented. Accordingly, the generalisability of the findings beyond the study population should be interpreted with caution. Finally, the study did not incorporate clinical diagnostic assessments or detailed measures of socioeconomic status, family functioning, or exposure to community violence. The absence of these variables may have limited the identification and interpretation of potential pathways underlying the observed associations.

Implications for practice and policy

The findings support several actionable recommendations:

- Expand school-based mental health services: train teachers and counsellors in screening, basic psychosocial interventions (e.g., problem-solving therapy), and referral protocols.
- Scale up evidence-based, gender-responsive preventive curricula that cover stress management, depression and suicide awareness, anger management, tobacco prevention, and digital citizenship.
- Strengthen systems for detecting and responding to self-harm, including confidential reporting, crisis referral pathways, and partnerships with local health services.
- Implement violence prevention strategies (restorative practices, conflict resolution training) and anti-bullying policies, with specific components addressing cyberbullying.
- Enhance tobacco control for youth: school education, enforcement of age restrictions, and community campaigns targeting male-dominated initiation patterns.

Received: *12-06-2026 -* ***Accepted:*** *10-08-2026 -* ***Published:*** *19-08-2026*

Future research

Longitudinal studies are needed to clarify trajectories of internalising and externalising problems and to evaluate the effectiveness of school-based interventions in this context. Qualitative work should explore barriers to help-seeking, gendered norms influencing risk behaviours, and school stakeholders' readiness to implement mental health programs. Finally, intervention trials of culturally adapted, scalable school mental health and tobacco-prevention programs would provide evidence for policy action.

Conclusions

This study reveals a multifaceted burden of mental health symptoms, self-harm, tobacco use, and violence among students, with pronounced sex differences and limited school-based prevention and support. Addressing these challenges requires integrated, gender-sensitive school mental health strategies, improved detection and referral systems, and strengthened tobacco and violence prevention efforts.

Data Availability Statement

All relevant data are within the article

Acknowledgments

The authors sincerely thank the principals of the schools for their valuable cooperation.

Conflict of Interest

The authors declare that they have no competing interests.

References

1. Kieling C, Buchweitz C, Caye A, Silvani J, Ameis SH, Brunoni AR, et al. Worldwide prevalence and disability from mental disorders across childhood and adolescence: evidence from the Global Burden of Disease Study. JAMA Psychiatry. 2024;81(4):347-356. doi:10.1001/jamapsychiatry.2023.5051.
2. World Health Organisation. Mental health of adolescents [Internet]. Geneva: World Health Organisation; 2025 [cited 2026 Aug 11]. Available from: https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health
3. UNICEF. Adolescents: overview [Internet]. New York: United Nations Children's Fund; 2024 [cited 2026 Aug 11]. Available from: https://data.unicef.org/topic/adolescents/overview
4. Racine N, McArthur BA, Cooke JE, Eirich R, Zhu J, Madigan S. Global prevalence of depressive and anxiety symptoms in children and adolescents during COVID-19: a meta-analysis. JAMA Pediatr. 2021;175(11):1142-1150. doi:10.1001/jamapediatrics.2021.2482.
5. Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. Arch Gen Psychiatry. 2005;62(6):593-602. doi:10.1001/archpsyc.62.6.593. ·
6. Patton GC, Sawyer SM, Santelli JS, Ross DA, Afifi R, Allen NB, et al. Our future: a Lancet commission on adolescent health and wellbeing. Lancet. 2016;387(10036):2423-2478. doi:10.1016/S0140-6736(16)00579-1. ·
7. World Health Organisation, United Nations Children's Fund. Helping adolescents thrive toolkit: strategies to promote and protect adolescent mental health and reduce self-harm and other risk behaviours. Geneva: World Health Organisation; 2021. ISBN: 978-92-4-002555-4. ·
8. Sawyer SM, Afifi RA, Bearinger LH, Blakemore SJ, Dick B, Ezeh AC, et al. Adolescence: a foundation for future health. Lancet. 2012;379(9826):1630-1640. doi:10.1016/S0140-6736(12)60072-5. ·
9. Charara R, Forouzanfar M, Naghavi M, Moradi-Lakeh M, Afshin A, Vos T, et al. The burden of mental disorders in the Eastern Mediterranean Region, 1990-2013: findings from the Global Burden of Disease Study 2013. PLoS One. 2017;12(1):e0169575. doi:10.1371/journal.pone.0169575.
10. World Health Organisation Regional Office for the Eastern Mediterranean. Regional action plan for mental health and psychosocial support in emergencies, 2024-2030. Cairo: WHO Regional Office for the Eastern Mediterranean; 2024. Report No.: EM/RC71/5-Rev.2. Available from: https://applications.emro.who.int/docs/TP-NMH-MHPSS-eng.pdf
11. Charlson F, van Ommeren M, Flaxman A, Cornett J, Whiteford H, Saxena S. New WHO prevalence estimates of mental disorders in conflict settings: a systematic review and meta-analysis. Lancet. 2019;394(10194):240-248. doi:10.1016/S0140-6736(19)30934-1.
12. World Health Organisation Regional Office for the Eastern Mediterranean. Mental health in emergencies [Internet]. Cairo: WHO Regional Office for the Eastern Mediterranean; 2019 [cited 2026 Aug 13]. Available from: https://www.emro.who.int/mnh/mental-health-in-emergencies/mental-health-in-emergencies.html
13. Institute for Health Metrics and Evaluation. Global Burden of Disease Study 2019: results tool [Internet]. Seattle (WA): Institute for Health Metrics and Evaluation; 2020 [cited 2026 Aug 13]. Available from: https://www.healthdata.org/research-analysis/gbd
14. United Nations Children's Fund. Libya: integration of mental health and psychosocial support in primary health care for children, adolescents, pregnant women and new mothers in the Middle East and North Africa Region: Libya report. Amman: UNICEF Middle East and North Africa Regional Office; 2024. Available from: https://www.unicef.org/mena/reports/libya-integration-mental-health-and-psychosocial-support-primary-health-care
15. El-Khodary B, Samara M. The mediating role of trait emotional intelligence, prosocial behaviour, parental support and parental psychological control on the relationship between war trauma and PTSD and depression. J Res Pers. 2019;81:246-256. doi:10.1016/j.jrp.2018.06.007.

Received*: 12-06-2026 -* ***Accepted****: 10-08-2026 -* ***Published****: 19-08-2026*

16. World Health Organisation Regional Office for the Eastern Mediterranean. Mental health services in Libya [Internet]. Cairo: WHO Regional Office for the Eastern Mediterranean; 2016 [cited 2026 Aug 13]. Available from: https://www.emro.who.int/lby/programmes/mental-health-programme.html
17. Thapar A, Eyre O, Patel V, Brent D. Depression in young people. Lancet. 2022;400(10352):617-31. doi:10.1016/S0140-6736(22)01012-1.
18. Solmi M, Radua J, Olivola M, Croce E, Soardo L, Salazar de Pablo G, et al. Age at onset of mental disorders worldwide: large-scale meta-analysis of 192 epidemiological studies. Mol Psychiatry. 2022;27(1):281-95. doi:10.1038/s41380-021-01161-7.
19. Riglin L, Petrides KV, Frederickson N, Rice F. The relationship between emotional problems in childhood and educational attainment: a meta-analysis. J Child Psychol Psychiatry. 2014;55(9):1053-65. doi:10.1111/jcpp.12224.
20. McLeod GFH, Horwood LJ, Fergusson DM. Adolescent depression, adult mental health and psychosocial outcomes at 30 and 35 years. Psychol Med. 2016;46(7):1401-12. doi:10.1017/S0033291715002950.
21. Elhadi M, Msherghi A, Elgzairi M, Alsuyahili A, Bouhuwaish A, Boughididah T, et al. The prevalence of post-traumatic stress disorder, depression, and anxiety among the general population during the COVID-19 pandemic in Libya: a cross-sectional study. Middle East Curr Psychiatry. 2023;30:43. doi:10.1186/s43045-023-00322-4.
22. Biswas T, Scott JG, Munir K, Renzaho AMN, Rawal LB, Baxter J, et al. Global variation in the prevalence of suicidal ideation, suicide attempts and self-harm among adolescents: a systematic review and meta-analysis. EClinicalMedicine. 2020;24:100395. doi:10.1016/j.eclinm.2020.100395.
23. Bilsen J. Suicide and youth: risk factors. Front Psychiatry. 2018;9:540. doi:10.3389/fpsyt.2018.00540.
24. Wilkinson P, Goodyer I. Non-suicidal self-injury. Eur Child Adolesc Psychiatry. 2011;20(2):103-8. doi:10.1007/s00787-010-0156-y.
25. Cipriano A, Cella S, Cotrufo P. Nonsuicidal self-injury: a systematic review. Front Psychol. 2017;8:1946. doi:10.3389/fpsyg.2017.01946.
26. Lim KS, Wong CH, McIntyre RS, Wang J, Zhang Z, Tran BX, et al. Global lifetime and 12-month prevalence of suicidal behavior, deliberate self-harm and non-suicidal self-injury in children and adolescents: a meta-analysis. Int J Environ Res Public Health. 2019;16(22):4581. doi:10.3390/ijerph16224581.
27. Nock MK, Green JG, Hwang I, McLaughlin KA, Sampson NA, Zaslavsky AM, et al. Prevalence, correlates, and treatment of lifetime suicidal behavior among adolescents: results from the National Comorbidity Survey Replication Adolescent Supplement. JAMA Psychiatry. 2013;70(3):300-10. doi:10.1001/2013.jamapsychiatry.55.
28. Kieling C, Whiteford H, Ferrari AJ, Welch C, Szabo CP, Saxena S. Child and adolescent mental health worldwide: evidence for action. Lancet. 2011;378(9801):1515-25. doi:10.1016/S0140-6736(11)60827-1.
29. Jordans MJD, Chisholm D, Semrau M, Juneja S, Scahill L, Baingana F, et al. Indicators for routine monitoring of effective mental health care for children and adolescents in low- and middle-income countries: a systematic review. Lancet Psychiatry. 2016;3(1):61-70. doi:10.1016/S2215-0366(15)00355-9.
30. Anderson P, Jané-Llopis E, Ståhl T, editors. The contribution of alcohol, tobacco and other drugs to adolescent health and development. Copenhagen: World Health Organization Regional Office for Europe; 2019.
31. Nilan K, McNeill A, Murray R, Tustin JL, McCausland K, Kippen R, et al. Global tobacco surveillance and monitoring of youth tobacco use: a systematic review. Tob Control. 2017;26(4):e85-e94. doi:10.1136/tobaccocontrol-2016-053015.
32. DiFranza JR, Savageau JA, Fletcher K, O'Loughlin J, Pbert L, McNeill AD, et al. Symptoms of tobacco dependence after brief intermittent use: the Development and Assessment of Nicotine Dependence in Youth-2 study. Arch Pediatr Adolesc Med. 2007;161(7):704-10. doi:10.1001/archpedi.161.7.704.
33. Kondo T, et al. Impact of smoking initiation age on nicotine dependency and smoking cessation among Japanese smokers. Eur Heart J Open. 2024;4(1):oead135. doi:10.1093/ehjopen/oead135.
34. Xi B, Liang Y, Liu Y, Yan Y, Zhao M, Ma C, et al. Tobacco use and second-hand smoke exposure among adolescents in 31 low-income and middle-income countries. Tob Control. 2016;25(2):143-50. doi:10.1136/tobaccocontrol-2014-051582.
35. World Health Organisation. WHO report on the global tobacco epidemic 2023: protect people from tobacco smoke. Geneva: World Health Organisation; 2023.
36. Thomas RE, McLellan J, Perera R. School-based programmes for preventing smoking. Cochrane Database Syst Rev. 2013;(4): CD001293. doi:10.1002/14651858.CD001293.pub3.
37. Onrust SA, Otten R, Lammers J, Sumnall H. School-based programmes to reduce and prevent substance use in different age groups: what works for whom? Systematic review and meta-regression analysis. Clin Psychol Rev. 2016;44:45-59. doi:10.1016/j.cpr.2016.01.002.
38. Elgar FJ, D'Lima C, Winding TN, Stenstrom K, Gariépy G, Gabhainn SN, et al. Unintentional injuries and violence among adolescents aged 12-15 years in 68 low-income and middle-income countries: a secondary analysis of data from the Global School-Based Student Health Survey. Lancet Child Adolesc Health. 2019;3(9):616-26. doi:10.1016/S2352-4642(19)30195-6.
39. Kann L, McManus T, Harris WA, Shanklin SL, Flint KH, Queen B, et al. Youth risk behavior surveillance—United States, 2017. MMWR Surveill Summ. 2018;67(8):1-114. doi:10.15585/mmwr.ss6708a1.
40. Gini G, Pozzoli T. Association between bullying and psychosomatic problems: a meta-analysis. Pediatrics. 2009;123(3):1059-65. doi:10.1542/peds.2008-1215.
41. John A, Glendenning AC, Marchant A, Montgomery P, Stewart A, Wood S, et al. Self-harm, suicidal behaviours, and cyberbullying in children and young people: systematic review. J Med Internet Res. 2018;20(4):e129. doi:10.2196/jmir.9044.
42. Moore SE, Norman RE, Sly PT, Whitehouse AJO, Zubrick SR, Scott J, et al. Adolescent peer aggression and its association with mental health and substance use in an Australian cohort. J Adolesc. 2014;37(1):11-21. doi:10.1016/j.adolescence.2013.10.006.
43. Gaffney H, Farrington DP, Ttofi MM. Examining the effectiveness of school-bullying intervention programs globally: a meta-analysis. Aggress Violent Behav. 2019;45:134-45. doi:10.1016/j.avb.2019.02.001.
44. Zych I, Farrington DP, Llorent VJ, Ttofi MM. Protecting children against bullying and its consequences. New York: Springer; 2017.

Received*: 12-06-2026 -* ***Accepted****: 10-08-2026 -* ***Published****: 19-08-2026*

45. Robinson J, Yuen HP, Gook S, Hughes A, Cosgrave E, Jorm AF, et al. Can receipt of a psychosocial intervention reduce suicidal ideation and suicide attempts among young people? A systematic review and meta-analysis. Psychol Med. 2022;52(11):2041-55. doi:10.1017/S0033291721001740.
46. Wyman PA. Developmental approach to prevent adolescent suicides: research pathways to effective upstream suicide prevention. Am J Prev Med. 2014;47(3 Suppl 2):S251-6. doi:10.1016/j.amepre.2014.05.039.
47. Fazel M, Hooper C, Jones N, Oberle E, Whitley J. Mental health interventions in schools in high-income countries: a systematic review. Lancet Psychiatry. 2014;1(5):377-87. doi:10.1016/S2215-0366(14)70312-8.

Received*: 12-06-2026 -* ***Accepted****: 10-08-2026 -* ***Published****: 19-08-2026*