



Prevalence and Associated Factors of Psychological Distress Among Secondary School Students in Mekelle City, Tigray Region, Ethiopia: Cross-Sectional Study

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Background: Psychological distress is defined as a state of emotional suffering characterized by the combination of symptoms of depression and anxiety. It is more prevalent in school adolescents than in the general population. There are no published studies that reflect the current status of psychological distress among Ethiopian school adolescents. So, this study aimed to determine the prevalence and associated factors of psychological distress among secondary students in Mekelle Town, North Ethiopia.

Methods: A school-based cross-sectional study was done among 782 from May 15 to June 15, 2018. Stratified multistage sampling procedure was used to select study subjects. Data were collected using a pretested and structured self-administered questionnaire. Psychological distress was assessed using Kessler Psychological Distress Scale (K10). Binary logistic regression models were fitted to identify associated factors. Adjusted odds ratio with its 95% confidence interval was used to declare the statistical significance between psychological distress and associated factors.

Results: A total of 845 students were enrolled in the study, with a response rate of 92.54%. The mean age of the participants was 16.24 years ($SD = \pm 1.17$). Prevalence of psychological distress among the study participants was 34.9%. Being female [AOR = 2.30; 95% CI: (1.28, 4.12)], current alcohol use [AOR = 3.08; 95% CI: (1.64, 5.77)], physical fight [AOR = 2.99; 95% CI: (1.69–5.28)], contact sexual abuse [AOR = 2.37; 95% CI: (1.23, 4.55)], non-contact sexual abuse [AOR = 1.91; 95% CI: (1.04, 3.49)], and being bullied [AOR = 1.81; 95% CI: (1.03, 3.29)] were significantly associated with psychological distress.

Conclusion: The prevalence of psychological distress in this study was high. Therefore, it is recommended to strengthen the activities that help to reduce or ameliorate the major causes of psychological distress.

Keywords: psychological distress, adolescent students, depression, anxiety

Introduction

Globally, mental health problems account for 13% of the total burden of disease, and 31% of all years lived with disability.¹ For most mental health disorders their first onset occurs in childhood or adolescence with severe mental disorder typically preceded by less severe events, thus leading to failure to detect and treat for years.² Approximately half of those with mental health disorders first experience the corresponding symptoms at approximate age 14.³ These early onsets of mental

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disorders have been accounted for a variety of adverse consequences, such as disruption of education and early career development of affected individuals.⁴

Psychological distress is defined as a state of emotional suffering characterized by the undifferentiated combinations of symptoms of depression (eg, lost interest; sadness; hopelessness) and anxiety (eg, restlessness; feeling tense) which are sometimes accompanied by somatic symptoms (eg, insomnia; headaches; lack of energy).^{5,6} Psychological distress among adolescent students is common in developed as well as in developing countries, and is a major public health challenge.^{7,8} This can be associated with undesirable mental health that affects their level of functionality⁹ and for many it impacts on educational achievement as well as the total health of adolescents, thereby having a substantial effect on opportunities in adult life.^{10–12} A study done among adolescent students in Canada showed that 35.1% suffered from psychological distress which was significantly higher than any other sector of the general population.⁷ Furthermore, 7.6% of students in California,¹³ 40.1% of students in China,¹⁴ 54% of students in Saudi Arabia,¹⁵ 64.7% of students in Indonesia,¹⁶ 20.8% of students in India¹⁷ and 41.7% of students in Egypt¹⁸ experienced psychological distress.

While psychological distress among school adolescent has been well researched in developed countries, very few studies are available in the African sub-region; particularly in Ethiopia. There is no published study that reflects the current status of psychological distress among secondary school students in Ethiopia. Therefore, this study is aimed to determine the prevalence of psychological distress and identify the associated factors of psychological distress among secondary school students in Mekelle Town, North Ethiopia. Results from this study will potentially serve to inform developing and integrating evidence-based and age-appropriate mental health promotion and disease prevention programs.

Methods

Study Design, Setting and Period

A school-based cross-sectional study was conducted from May 1 to 30, 2018 at Mekelle city the capital of the Tigray region of Ethiopia. According to the information from Mekelle Town Education Bureau, the total number of young people enrolled in secondary school (grade 9–12)

in 2017/18 was 22,728 (male = 10,787, female = 11,941). Of these, 17,669 were from public schools.

Study Participants

All secondary school students enrolled in the year 2017/2018 in the town were the source population and all students in the randomly selected secondary schools were the study population. Students under 15 years of age and those who were seriously ill during the data collection were excluded.

Sample Size and Sampling Technique

The sample size was calculated using single population proportion formula by considering the following assumptions; proportion of psychological distress as 50% because no similar study done in Ethiopia among secondary school student, 95% confidence interval, 5% margin of error, 10% non-response rate and design effect of 2.0. Accordingly, the sample size was 845.

Stratified multistage sampling technique was used to select a representative sample of students. Four schools from 12 public and five from 14 private schools were selected randomly after stratifying the schools into public and private. The total sample for each grade from grade 9 to 12 of the public and private schools was proportionally allocated based on their student size. Finally, the study subjects from each grade were selected by using a lottery method following a computer-generated random numbers from their attendance lists.

Data Collection and Instruments

Data were collected by four Bsc psychiatric nurses using a structured self-administered questionnaire which has four parts. The first part of the questionnaire captured the socio-demographic characteristics of the study participants.

The second part of the questionnaire is the Kessler Psychological Distress Scale (K10), which was used to estimate the prevalence of psychological distress in students. It is developed on the basis of item response theory models¹⁹ which consists of ten questions asking about the frequency of non-specific psychological distress in the past month.²⁰ It has five possible responses for each question ranging from “none of the time” (score 1) to “all of the time” (score 5). All the responses were collated to obtain a total score. A total score of <20 was considered normal; 20–24 mild distress; 25–29 moderate distress; and 30–50 severe distress.²¹ In this study, the scores were dichotomized into those who scored <20 (absence of

psychological distress) and those who scored ≥ 20 (presence of psychological distress).²² The tool has been validated by WHO to be used by developing countries.²³ Its internal consistency, Cronbach's α coefficient in the current study was 0.86.

The third part of the questionnaire was about behavioral factors, which include history of substance use (ie, alcohol use, khat chewing, and cigarette smoking), physical exercise and physical fighting.

The final part of the questionnaire asked about psychological factors, which includes sexual abuse, suicidality, being bullied and social support. History of sexual abuse was assessed by four questions regarding lifetime exposure to sexual abuse adopted from ISPCAN Child Abuse Screening Tool Children's version.²⁴ Suicidal history was assessed using two questions with yes/no response adopted from SDQ-14 (Suicidal behavior questionnaire).²⁵ Being bullied considered students' experiences with the exposure to a bullying behavior as defined by

Bullying occurs when a student being repeatedly teased, threatened, hit, kicked, or excluded by other students or group of students. It is not bullying when two students of about the same strength or power argue or fight when teasing is done in a friendly and hilarious way.²⁶

The question for being bullied was adopted from the GSHS (Global School-based Health Survey) developed by WHO and Center for Disease Control.²⁷ Social support was measured by the Oslo-3 scale. It has the sum score scale ranging from 3 to 14.²⁸

Data Quality Control

To assure the data quality the English version of the questionnaire was translated into Tigrigna, the official language of the study area, by a panel of experts fluent in the language. It was then translated back into English by another person to ensure consistency with the English language questionnaire. The Tigrigna language questionnaire was used to collect data.

Pre-testing was done two weeks before the actual data collection time among 43 students at schools which were not included in the study for clarity of the questionnaires. Two-day training was given for supervisors and data collectors. During data collection data collectors were supervised at each site. The collected data were reviewed and checked for completeness before data entry and incomplete data were discarded. A data entry format template was produced and programmed.

Data Collection and Analysis

Data were checked, coded and entered to Epi-Data Version 3.1 and was exported to SPSS (Statistical Package for Social Science) version 20 for analysis. The socio-demographic characteristics and other factors of respondents were analyzed by descriptive statistics (percentage, mean standard deviations). Bivariate logistic regression analysis was performed to identify the association of each independent variable with the outcome variables. All variables with a p -value of ≤ 0.20 at bivariate logistic regression analysis were entered into the multivariate logistic regression model to control the possible effect of confounders. A p -value of less than 0.05 was considered statistically significant, and the adjusted odds ratio (AOR) with 95% confidence interval (CI) was calculated. Results are presented in the form of tables using frequency and summary statistics such as mean and percentage to describe the study population in relation to relative variables and discussed in the context of previous results. The model fitness was checked using Hosmer and Lemeshow goodness of fit test statistics.

Ethical Considerations

Ethical clearance was obtained from the University of Gondar Institutional Review Board and Amanuel Mental Specialized Hospital Ethical Review Committee with code number of AM/146/4/214; a formal letter was obtained from the school authorities and submitted to the selected schools before the data collection. Students were informed that confidentiality would be maintained and their participation had no impact on their school work. From those students who are < 18 years old and from their parents, written informed assent and written informed consent were taken, respectively. But only written informed consent was obtained from those ≥ 18 years.

Students were informed that if they required any help with any of the issues regarding the study, they could approach the facilitator who had received appropriate training. To ensure privacy, students were seated sufficiently far apart so that they could complete their questionnaires without being seen by other students.

Results

Socio-Demographic Characteristics

From a total of 845 study participants, 782 students participated in the study giving a response rate of 92.54%. Of the total respondents, 406 (51.9%) were females. The mean (SD)

age of participants was (16.26 ± 1.17) years, ranging from 15 to 20 years. Over three-quarters of respondents were from public schools (77%) with a majority being Tigrian by ethnicity (97.3%) and Orthodox by religion (89.8%). Among the respondents, 562 (71.9%) lived with both parents. Almost more than one-third of participants were grade nine (34.8%) (Table 1).

Prevalence of Psychological Distress

The overall prevalence of psychological distress among the study participants was 34.9% with 95% CI (31.6, 38.2); of these 112 (14.3%) of the students (49 males and 63 females) had mild psychological distress, 85 (10.9%) of the students (34 males and 51 females) had moderate psychological distress, and 76 (9.7%) of the students (21 males and 55 females) had severe psychological distress.

Table 1 Socio-Demographic Characteristics of Secondary School Students in Mekelle City, 2018

Variables		Frequency (n=782)	Percent
Gender	Male	376	48.1
	Female	406	51.9
Age	≥15	268	34.3
	16–17	359	45.9
	18–19	155	19.8
Family structure (living arrangements)	Both parents	558	71.4
	Single parent	139	17.8
	Guardian	85	10.8
Ethnicity	Tigrian	761	97.3
	Others*	21	2.7
Religion	Orthodox	702	89.8
	Muslim	58	7.4
	Others**	22	2.8
School type	Public	602	77
	Private	180	23
Grade	Nine	272	34.8
	Ten	237	30.3
	Eleven	122	15.6
	Twelve	151	19.3
School performance	Performed below average (<50%)	223	28.5
	Performed above average (≥50%)	559	71.5
Having close friends at school	Yes	663	84.8
	No	119	15.2

Notes: *Amhara, Oromo, Gurage, **Protestant, catholic.

Behavioral Characteristics of the Participants

From a total of 782 study participants, 306 (39.1%) had drunk alcohol at least once in their lifetime, and 198 (25.3%) of them had a history of alcohol use within the past three months. Ninety-two (11.8%) of the study subjects had been chewing khat at least once in their life, and 43 of them chewed khat in the last three months. Out of the total participants, 60 (7.7%) had smoked Tobacco at least once in their lifetime, whereas nine (1.2%) of them smoked tobacco in the last three months. Among the students who participated in this study more than three fourths (80.7%) of them were physically active, and 314 (40.2%) of the respondents were involved in a physical fight at least once in the past year (Table 2).

Psycho-Social Characteristics of the Participants

Almost one-quarter of the study participants (23.7%) had a previous history of suicidal thoughts, whereas 149

Table 2 Distribution of Secondary School Students by Their Behavioral Characteristics at Mekelle City, 2018

Variables		Frequency (n=782)	Percent
Khat use			
Ever use history	Yes	92	11.8
	No	690	88.2
Current use history	Yes	43	5.5
	No	739	94.5
Alcohol use			
Ever use history	Yes	306	39.1
	No	476	60.9
Current use history	Yes	198	25.4
	No	584	74.6
Tobacco use			
Ever use history	Yes	60	7.7
	No	722	92.3
Current use history	Yes	9	1.2
	No	773	98.8
Meets physical activity recommendation	Yes	631	80.7
	No	151	19.3
History of physically fight	Yes	314	40.2
	No	468	59.8

Table 3 Distribution of Psycho-Social Characteristics of Secondary School Adolescents in Mekelle City, 2018

Variables		Frequency (n=782)	Percent
Suicidal thought	Yes	185	23.7
	No	597	76.3
Suicidal attempt	Yes	149	19.1
	No	633	80.9
Contact sexual abuse	Yes	201	25.7
	No	581	74.3
Noncontact sexual abuse	Yes	205	26.2
	No	577	73.8
Bullying	Yes	261	33.4
	No	521	66.6
Social support	Poor	228	29.2
	Moderate	320	40.9
	Strong	234	29.9

(19.1%) had suicidal attempt history. History of contact and non-contact sexual abuse was found about 25.7% and 26.2%, respectively. Out of the total study participants, 261 (33.4%) had a history of being bullied at least once in the past 12 months. Regarding social support, more than one-third (40.9%) of respondents had been score 9–11 which is considered as having moderate social support (Table 3).

Factors Associated with Psychological Distress

From bivariate logistic regression analysis, gender, Family structure (living arrangements) of the students, school type, friendship, current alcohol use, history of physical fighting, history of suicidal ideations, history of suicidal attempt, contact and non-contact sexual abuse, social support, and being bullied fulfilled the criteria of $p \leq 0.2$ significance level were taken into consideration for multivariable logistic regression analysis.

On multivariable logistic regression analysis after adjusting all confounding factors being female, current alcohol use, physical fighting, contact and non-contact sexual abuse, and being bullied were significantly associated with psychological distress ($P < 0.05$).

In case of gender, the odds of developing psychological distress among female students was 2.30 times more likely to develop psychological distress as compared to male students [AOR=2.30; 95% CI: (1.28, 4.13)]. The odds of

developing psychological distress was high among those participants with a history of physical fighting at least once in the last 12 months than those without a history of a physical fighting [AOR=2.99; 95% CI: (1.69, 5.29)]. The odds of developing psychological distress was 3.08 times greater than among those who had reported current Alcohol use as compared to those who had not reported current alcohol use [AOR=3.08; 95% CI: (1.64, 5.77)]. The odds of developing psychological distress was 2.34 times more likely among students who had reported a history of contact sexual abuse than those who had not reported contact sexual abuse [AOR=2.37; 95% CI: (1.23, 4.55)] and 1.91 times more likely among students who had reported non-contact sexual abuse than those who had not reported non-contact sexual abuse [AOR=1.91; 95% CI: (1.05, 3.49)]. The odds of psychological distress was 1.82 times more among those who had a history of being bullied as compared to those who had no history of being bullied [AOR=1.82; 95% CI: (1.03, 3.29)] (Table 4).

Discussion

The overall prevalence of psychological distress among the students in this study was found to be 34.9%. This finding was lower compared to studies in China,¹⁴ Egypt,¹⁸ Saudi Arabia,¹⁵ and Indonesia¹⁶ with the rate of 40.1%, 41.7, 54% and 64.7%, respectively. This could be due to the difference in socio-economic, cultural and environmental factors in addition to large sample use in the China study and different tools use in the rest studies.

However, the prevalence in this study was higher than the study conducted in California (7.6%)¹³ and India (20.9%).¹⁷ This variance could be due to the difference in socio-cultural and environmental factors in addition to the tool difference in California. Moreover, this finding was in line with a study conducted in Canada where 35.1% of the study participants were found to be psychologically distressed.⁷

In this study, the likelihood of developing psychological distress was higher among female students as compared to their male counterparts [AOR=2.30; 95% CI: (1.28, 4.13)]. The finding is consistent with other studies in Canada,⁷ Australia,²⁹ Indonesia,¹⁶ India,¹⁷ Saudi Arabia¹⁵ and Egypt.¹⁸ Puberty brings physical as well as psychological changes among adolescents. Especially in girls in addition to physical changes like menstruation-related hormonal changes; domestic workload and other stressors lead to emotional tensions which might be

Table 4 Factors Associated with Psychological Distress Among Secondary School Students in Mekelle City, 2018

Variables	Psychological Distress		Crude OR (95% CI)	Adjusted OR (95% CI)
	Yes	No		
Gender/sex				
Male	105	271	1	1
Female	168	238	1.822(1.35, 2.46)	2.30(1.28, 4.13)*
Family structure				
With both parents	178	380	1	1
With single parent	54	85	1.36(0.92, 1.99)	1.28(0.64, 2.57)
Guardian	41	44	1.99(1.25, 3.15)	0.97(0.39, 2.44)
School type				
Public	233	369	2.21(1.50, 3.26)	1.17(0.59, 2.31)
Private	40	140	1	1
Friendship				
Yes	223	440	1	1
No	50	69	1.43(0.96, 2.12)	1.40(0.66, 2.96)
Current alcohol use				
Yes	116	82	3.85(2.207, 6.76)	3.08(1.64, 5.77)**
No	157	427	1	1
Physical fight				
Yes	150	164	2.56(1.90, 3.47)	2.99(1.69, 5.29)**
No	123	345	1	1
Suicidal thought				
Yes	114	71	4.42(3.12, 6.26)	1.29(0.57, 2.92)
No	159	438	1	1
Suicidal attempt				
Yes	81	68	2.74(1.91, 3.94)	1.84(0.77, 4.39)
No	192	441	1	1
Non-contact sexual abuse				
Yes	115	90	3.39(2.43, 4.72)	1.91(1.05, 3.49)*
No	158	419	1	1
Contact sexual abuse				
Yes	111	90	3.19(2.29, 4.45)	2.37(1.23, 4.55)*
No	162	419	1	1
Bullied				
Yes	144	117	3.74(2.73, 5.12)	1.82(1.03, 3.29)*
No	129	392	1	1

Notes: 1.00 remained for reference category. *Significance at p-value <0.05, **Significance at p-value <0.001.

Abbreviations: OR, odds ratio; CI, confidence interval.

a possible cause for high prevalence of psychological distress.^{30,31}

Those students with the history of current alcohol use were more likely to experience psychological distress [AOR=3.08; 95% CI: (1.64, 5.77)]. This finding was supported by other studies including a multi-country study of 12 developing countries,⁸ a cohort of African American longitudinal study³² and Finland.³³ This finding may be

due to the fact that adolescents are curious to use alcohol³⁴ and they use alcohol as a way of coping with conflicts and other difficult events.³⁵ This alcohol consumption can lead to psychological distress especially in later adolescence age (from age 15–19).³⁶ Moreover, psychological distress was found to be significantly associated with “having been in a physical fight” in the past year [AOR=2.99; 95% CI: (1.69, 5.29)]. This finding was supported by a study done

in Western Pacific Island countries.³⁷ The affective feelings after experiencing physical aggression could be a possible reason for the high prevalence of psychological distress among those involved in a physical fight.³⁸

Students reporting either contact or non-contact sexual abuse were significantly associated with higher rates of psychological distress. This finding is supported by a study done in India.¹⁷ This is due to the fact that sexual abuse experienced in childhood or adolescence is a developmental stressor this might lead to profound, long-term psychological distress.³⁹ The study also found that psychological distress was significantly associated with having the history of being a victim of bullying. This finding is in line with the studies in California¹³ and Ghana.⁴⁰ This could be explained by bullying victim-students reports of poor academic performance and increased absenteeism which can further lead to psychological distress in school adolescents.²⁶

Limitations

This study has limitations that should be considered when interpreting the results. First, the cross-sectional nature of the study design does not provide or confirm/disconfirm an actual cause and effect relationship. Furthermore, the study may face reporting bias since the data were collected by a self-administrative instrument and some of the questions required recall of past history which may be prone to recall bias. Finally, some potentially important variables were not included in our analysis due to omission (eg, school environment-related factors, student-related behavioral factors, and socioeconomic factors).

Conclusions

The prevalence of psychological distress among secondary school adolescents in this study was high. Being female, current alcohol use, sexual abuse, physical fighting, and bullying were factors significantly associated with psychological distress in this group. Therefore, it is recommended to strengthen activities that help in reducing psychological distress directed to adolescent student with emphasis on effective measures to reduce the likelihood of drinking alcohol, involving in a physical fight, bullying by peers, and sexual abuse.

Data Sharing Statement

The datasets used and/or analyzed during the current study can be available from the corresponding author on reasonable request.

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Disclosure

The authors report no conflicts of interest in this work.

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