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Depression, anxiety, psychological distress and associated factors among students attending Nemelifen Secondary and Preparatory School, Afar regional state, Ethiopia: a cross-sectional study

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ABSTRACT

Objectives This study aimed to assess the magnitude of depression, anxiety, psychological distress and associated factors in Nemelifen Secondary and Preparatory School at Awash 7 Kilo, zone 3, Afar, Ethiopia.

Design An institutional-based cross-sectional study design was implemented.

Setting This research was conducted in Afar regional state, zone 3, Awash 7 Kilo town.

Participants A pretested, structured, self-administered questionnaire was used to gather information from 392 study participants. For the purpose of identifying risk variables for depression, anxiety and psychological distress, bivariate and multivariate binary logistic regression analyses were used.

Outcome measures The primary outcome of the study was magnitude of depression, anxiety and psychological distress and the secondary outcome was factors associated with depression, anxiety and psychological distress.

Results Overall, 109 study participants showed symptoms of depression (28.91%; 95% CI: 24.3%, 33.2%), 85 had symptoms of anxiety disorder (22.55%; 95% CI: 18.7%, 27.3%) and 168 had symptoms of psychological distress (44.56%; 95% CI: 39.6%, 49.6%). While anxiety was linked to ever drinking alcohol (adjusted OR (AOR)=2.87; 95% CI: 1.13, 7.28) and suicidal ideation (AOR=3.23; 95% CI: 1.80, 5.79), depression was significantly associated with having very good relationships with classmates (AOR=0.22; 95% CI: 0.09, 0.55) and suicidal ideation (AOR=2.26; 95% CI: 1.29, 3.94). The level of education (being in the ninth grade) and suicidal ideation (AOR=2.86; 95% CI: 1.49, 4.86) were also related to psychological distress.

Conclusion High levels of depression, anxiety and psychological distress were discovered. Very positive relationships with classmates were significantly linked to depression, while ever drinking was linked to anxiety. Likewise, the level of educational was related to psychological distress. All three of the dependent variables were linked to suicidal ideation. Above all, there was a connection among psychological distress, anxiety and depression.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The study tried to address the magnitude and associated factors of the three most widely prevalent mental illnesses (ie, depression, anxiety and psychological distress) at a time.
⇒ Also, the receiver operating characteristic curve analysis was performed in order to validate a cut-off value with high sensitivity and specificity.
⇒ The study did not ask students whether or not they had taken the test/examination in the past month before the study began.
⇒ This study cannot show the temporal relationship, since the study design used is cross-sectional by nature.

INTRODUCTION

According to estimates from the WHO, depression and anxiety account for 30% of all non-fatal diseases in the globe and 10% of all diseases, including those that cause disability and death.[1]

Similar to other aspects of health, socioeconomic issues can have an impact on mental health; thus, it is important to assess them through comprehensive strategies for promotion, prevention, treatment and recovery from a national perspective.[2] Numerous mental illnesses in teenagers occur under the general headings of mood disorders, behavioural disorders and anxiety disorders. Many students are being treated for multiple mental illnesses simultaneously. Suicide is third among all causes of death in the USA for those aged 10–24 years. Up to 60% of

them were experiencing depression at the time of their suicide, making it the single most troubling potential outcome of adolescent mental health issues.[3]

Globally, depression led to a total of over 50 million years lived with disability in 2015. More than 80% of this non-fatal disease burden occurred in low-income and middle-income countries. Besides, anxiety disorder led to a total of 24.6 million years lived with disability in 2015.[1]

Numerous studies have shown that the majority of adult mental disorders started during adolescence; thus, it is crucial to understand the scope and risk factors of depression, anxiety and psychological disorders at an early age. Additionally, in this age range, the comorbidity of many mental diseases is already evident.[4] For instance, one in four people in the UK encounter mental health issues, and 10% of young people have a clinically diagnosable mental health disease.[5] According to a meta-analysis, 23.3% of adolescent Brazilian students reported having a mental illness.[6]

According to a study conducted in rural Zimbabwe, 10.1% of the population had suicidal thoughts, while 51.7% were classed as being at risk of depression, anxiety and psychological distress. Additionally, 23.8% were at risk of serious mental disorders.[7] According to a different study conducted in four districts of Uganda, 8.6% of people had a depressive disorder syndrome.[8]

About 6.5% of disease burden in Ethiopia is attributable to depression alone.[9] In contrast, 57.6% of Dessie Preparatory School students who participated in the survey reported having experienced loneliness and depression at least once in the 3 months prior to the study.[10] In the other study on the severity of mental discomfort conducted by Hawassa University, more than a quarter of study participants disclosed experiencing mental distress.[11] The prevalence of social anxiety disorder was estimated to be 27.5% in a recent study conducted at Woldia Preparatory School.[12]

Unfortunately, the mental disorder issues of students are not well recognised even though almost all of them claimed to be incepted at these age categories and intervening at this time would be of pivotal importance. In contrary, many interventions tend to address the prevailing problem on adults. However, these efforts do seem to be ill timed and not based on systematic evidence into possible determinants of the prevailing practice. Additionally, since there was evidence that the symptoms of depression, anxiety and psychological distress varied from region to region and population to population, such studies had never been carried out in pastoral areas before, and there was not a single study that demonstrated an association between psychological distress, depression and anxiety in Ethiopia. Therefore, the goal of the current study was to help bridge the knowledge gap.

METHODS AND MATERIALS

Study area and period

The Nemelifen Secondary and Preparatory School, the only government-owned school in Awash 7 Kilo town, zone 3, Afar regional state, served as the site of this study. In total, 1446 normal students in grades 9 through 12 were enrolled for the 2019–2020 school year. The majority of people depend on commerce and allied activities, employment by the government or the private sector, and various types of small companies, which results in a diverse way of life. The town is situated in the Afar regional state, 398 km from Semera, the regional seat, and 220 km from Addis Ababa on the main asphalt road to Djibouti. The study was conducted from 3 July to 7 July 2020.

Study design and population

An institution-based cross-sectional study design was implemented. The source populations were all students attending Nemelifen Secondary and Preparatory School in Awash 7 Kilo town. All students in Nemelifen Secondary and Preparatory School who attended the school during the study period were the study population. Students who were attending the school in 2019/2020 and present in the school on the day of the administration of the questionnaire were included. Students who were seriously ill at the time of data collection were excluded.

Sample size determination and sampling procedures

The sample size was calculated by double population proportion formula using Epi Info V.7, StatCalc program considering 31.43% of alcohol consumers not depressed, 44.35% of alcohol consumers depressed, 80% power, 95% CI, 1:1 ratio and 10% non-response rate from a research conducted at Woldia High School.[12] This sample size calculation procedure was used as it yielded the maximum sample size for the study which kept the highest precision. Since the total number students in the school was less than 10 000, we used finite population correction formula, and the final sample size was 392. Students of Nemelifen Secondary and Preparatory School were stratified based on their educational level (ie, grades 9, 10, 11 and 12). Then, students from each grade were selected by using simple random sampling technique. Attendance sheets of all sections were used as a sampling frame. Then, after the probability proportional to size (PPS) allocation of students based on their respective class size, computer-generated random numbers were used to select study units by using the OpenEpi V.3.01 software. The randomly selected student who was not present in the school was replaced by the next student in the order (figure 1).

Operational definitions

Depression

Depression is characterised by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or poor appetite, feelings of tiredness and poor concentration. It can be long-lasting or recurrent,

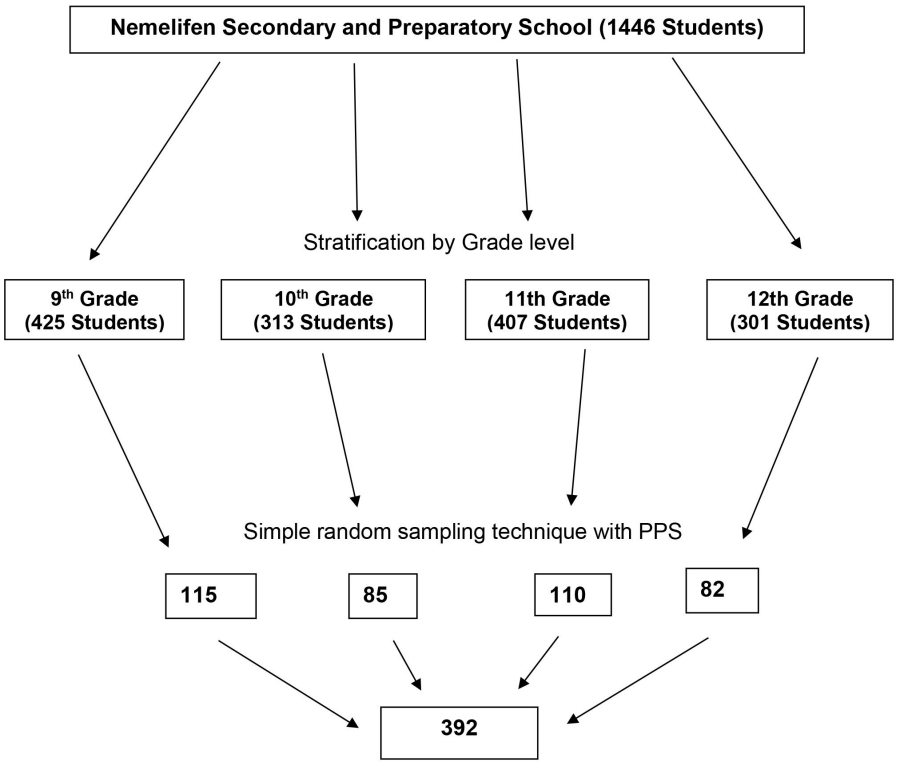

Figure 1 Schematic presentation of sampling procedure and selection process.

substantially impairing an individual's ability to function at school or cope with daily life.[1] According to the Patient Health Questionnaire-9 (PHQ-9), the cut-off point for depression is ≥10.[13]

Anxiety disorder

Anxiety disorder refers to a group of mental disorders characterised by feelings of anxiety and fear, including generalised anxiety disorder, panic disorder, phobias, social anxiety disorder, obsessive-compulsive disorder and post-traumatic stress disorder.[1] According to the seven-item Generalized Anxiety Disorder (GAD-7) Scale, the cut-off point for anxiety disorder is >10.[14]

Mental (psychological) distress

Individuals with mental distress present with different levels of depression, anxiety or somatic symptoms. These symptoms significantly interfere with their relationships with other people, their classmates and enjoyment of life.[15] According to Kessler Psychological Distress Scale (K10), the cut-off point for psychological distress is >20.[2]

Additionally, the cut-off values used for depression, anxiety and psychological distress were verified by receiver operating characteristic (ROC) curve analysis. It had highest sensitivity and specificity at the stated values.

Data collection process and quality control

The instruments to measure the dependent variables were the modified form of PHQ-9 (ranging from 0 (not at all) to 3 (nearly every day)) for assessment of depression, GAD-7 (ranging from 0 (not at all) to 3 (nearly every day)) for anxiety disorder and the K10 Scale that involved 10 questions about psychological distress, each with a five-level response scale. Reliability of the tools was checked by Cronbach's alpha, which yielded 0.77, 0.87 and 0.83 for PHQ-9, GAD-7 and K10 Scale, respectively.

General Social Survey's four questions were employed to measure the student's suicidal ideation. The scale consists of four questions on suicidal attitudes that asked the students their opinions about justifiability of committing suicide in each of the four life crises, that is, confronting incurable disease and bankruptcy or dishonoured his/her family and being tired of living.[16 17]

The questionnaire was developed in English language originally and translated to Amharic and Afargna. The Amharic and Afargna versions were translated back to English to verify the consistency. The Amharic and Afargna-language questionnaires were used to collect data after being pretested in Awash Arba High School. The pretest was carried out in 5% of sample size 1 week prior to the actual data collection time and excluded from the actual subjects. The questionnaires were checked for clarity, understandability, uniformity and completeness of the questions, and important amendments were done based on the pretest result. The logical flow of ideas was also maintained. The data collection process was monitored by the principal investigator.

The data were collected using a self-administered questionnaire. The questionnaire had six parts: part I, sociodemographic; part II, depression measurement; part III, anxiety disorder measurement; part IV, mental (psychological) distress measurement; part V, substance use; and part VI, clinical illness and other related factors.

The qualities of data were assured by properly designing and pretesting the questionnaire, organising orientation sessions on missing values of the questionnaire. Every day the questionnaires were reviewed and checked for completeness and relevance by the principal investigator.

Data processing and analysis

Data were checked, coded and entered into Epi Info V.7. After double entry by two data clerks independently, consistency of the entered data was checked, and the identified variation was corrected using the original questionnaire. Finally, the data were exported to SPSS V.21 for cleaning and analysis. Descriptive analyses like percentage and mean with SD were performed for the dependent and independent variables and presented by tables and texts.

To examine the relationship between the dependent and independent variables, multivariate binary logistic regression was used. Candidates for the multivariable binary logistic regression model included variables with a bivariate p value of less than 0.25. Variables with a p value of 0.05 were regarded as statistically significant in the multivariable binary logistic regression model, and adjusted ORs (AORs) with 95% CIs were reported to indicate the strength of relationship.

Patient and public involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

RESULTS

Sociodemographic characteristics among the respondents

Out of the total sample size, 377 (96.2%) of them responded completely to the questionnaire. The non-respondents refused to return the questionnaires for unclear reasons. Among the total respondents who answered the questionnaire, 205 (54.4%) were males. The mean age of the study participants was 16.9 (±1.813) years. Majority of study participants were Amhara by ethnicity (122, 32.4%) and Muslim by religion (204, 54.1%). Majority (350, 92.8%) of the respondents were single in marital status and living with both parents (212, 56.2%). Finally, among the total respondents, 296 (78.5%) permanently dwell in an urban setting (table 1).

Table 1 Sociodemographic characteristics of students in Nemelifen Secondary and Preparatory School, 2020 (N=377)

Characteristics		Number (%)
Sex		
	Male	205 (54.4)
	Female	172 (45.6)
Age (years)		
	14–19	343 (91.0)
	20–24	34 (9.0)
Ethnicity		
	Afar	108 (28.6)
	Argoba	51 (13.5)
	Tigre	16 (4.2)
	Amhara	122 (32.4)
	Oromo	62 (16.4)
	Other*	18 (4.9)
Religion		
	Muslim	204 (54.1)
	Orthodox	126 (33.4)
	Protestant	43 (11.4)
	Others†	4 (1.1)
Grade level		
	9th	112 (29.7)
	10th	80 (21.2)
	11th	105 (27.9)
	12th	80 (21.2)
Marital status		
	Single	350 (92.8)
	Married	20 (5.3)
	Divorced	5 (1.4)
	Living separately after marriage	2 (0.5)
Living status		
	Mother only	87 (23.1)
	Father only	19 (5.0)
	Both parents	212 (56.2)
	Relatives	33 (8.8)
	Alone	16 (4.2)
	Other‡	10 (2.7)
Permanent place of residence		
	Urban	296 (78.5)
	Rural	81 (21.5)

*Silte, Gurage, Wolayta and Kembata.
†Catholic and Jehovah's witness.
‡Friends/roommate.

Magnitude of depression, anxiety and psychological distress

Among the study participants, the overall magnitude of depression was estimated to be 109 (28.91%; 95% CI: 24.32%, 33.48%), while anxiety disorder was found to be 85 (22.5%; 95% CI: 18.29%, 26.72%). Almost close to half of the study participants (168 (44.6%; 95% CI: 39.58%, 49.62%)) had symptoms of psychological distress. Lastly, the magnitude of mental disorder (ie, those students having at least one of the three mental disorders) was estimated to be 209 (55.4%; 95% CI: 50.38%, 60.42%).

Descriptions of substance abuse-related factors

Among the total study participants, 70 (18.6%) were previous khat chewers and 84 (22.3%) reported chewing khat currently. From the current khat chewers, 40 (10.8%) stated that they chew once per week, followed by 31 (8.6%) who chew khat almost every day. Thirty-three (39.3%) of the current chewers spent 50 birrs on average per week on khat. Previous cigarette smokers

Table 2 Behavioural characteristics of students in Nemelifen Secondary and Preparatory School, 2020 (N=377)

Characteristics	Number (%)
Previously chewed khat	
Yes	70 (18.6)
No	307 (81.4)
Currently chew khat	
Yes	84 (22.3)
No	293 (77.7)
Previously smoked cigarettes	
Yes	18 (4.8)
No	359 (95.2)
Currently smoke cigarettes	
Yes	42 (11.1)
No	335 (88.9)
Previously drank alcohol	
Yes	80 (21.2)
No	297 (78.8)
Currently drink alcohol	
Yes	64 (17.0)
No	313 (83.0)
Previously smoked shisha	
Yes	25 (6.6)
No	352 (93.4)
Currently smoke shisha	
Yes	53 (14.1)
No	324 (85.9)

were reported to be 18 (4.8%), while the current smokers were 42 (11.1%). Ten (23.8%) students consume six pieces of cigarettes on average per week. When looking at the alcohol consumption rate, 80 (21.2%) reported that they were previous alcohol consumers, whereas 64 (17.0%) consumed alcohol currently. Among the current alcohol consumers, half of them consume it once per week. Beer and wine were the most common types of alcohol consumed by students followed by karibo, tela and tej. The current shisha smoking rate was reported to be 53 (14.1%). Most students spent on average 50 birrs per week to smoke shisha (table 2).

Description of clinical and other related factors

Regarding their medical illness, 179 (47.5%) students reported that they experienced recurrent headache followed by heart disease (24, 6.4%). About 39 (10.3%) students reported that they were from the family with a history of mental illness. Apart from regular education, the students were participating in the services provided in the school compounds like mini media (72.4%), psychological counselling and guidance (19.4%), and other extracurricular activities (39.5%), like science and technology club. Just more than half (56.2%) of the students

Table 3 Clinical and related characteristics among students in Nemelifen Secondary and Preparatory School, 2020 (N=377)

Characteristics	Number (%)
Medical illness	
Heart disease	24 (6.4)
Diabetes mellitus	21 (5.6)
Asthma	21 (5.6)
HIV/AIDS	4 (1.1)
Recurrent headache	179 (47.5)
Other*	25 (6.6)
Family history of mental illness	
Yes	39 (10.3)
No	338 (89.7)
Services provided	
Counselling and guidance	73 (19.4)
Mini media	273 (72.4)
Medical support	11 (2.9)
None	20 (5.3)
Participation in extracurricular activities	
Yes	149 (39.5)
No	228 (60.5)
Interstudent relationship	
Very good	212 (56.2)
Good	140 (37.1)
Poor	25 (6.7)
Perception about the school	
Very stressful	52 (13.8)
Stressful	80 (21.2)
Not stressful	245 (65)
Suicidal ideation	
Yes	74 (19.6)
No	303 (80.4)

*Malaria, common cold and typhoid fever.

reported having a very good and good (37.1%) interstudent relationship. About 80 (21.2%) of the students claimed that their school environment was stressful. A significant portion of students (19.6%; 95% CI: 15.59%, 23.61%) reported suicidal ideation (table 3).

Factors associated with depression

In the bivariate binary logistic regression analysis, history of alcohol consumption, interstudent relationships, perception about the school environment, anxiety and psychological distress, and suicidal ideation were significantly associated with depression. However, by the multivariable binary logistic regression analysis, interstudent relationship, suicidal ideation, anxiety and psychological distress were significantly associated with

Table 4 Factors associated with depression symptoms among Nemelifen Secondary and Preparatory School students, 2020

Variables		Depression		COR (95% CI)	AOR (95% CI)
		Yes	No		
Had history of alcohol drinking					
	Yes	34	46	2.19 (1.31, 3.66)	1.97 (0.87, 4.46)
	No	75	222	1	1
Interstudent relationships					
	Very good	48	164	0.20 (0.08, 0.46)	0.22 (0.09, 0.55)*
	Good	46	94	0.33 (0.14, 0.78)	0.32 (0.12, 0.82)*
	Poor	15	10	1	1
Perception about the school					
	Very stressful	15	37	0.99 (0.63, 1.57)	0.79 (0.37, 1.68)
	Stressful	32	48	1.97 (1.16, 3.35)	1.60 (0.91, 2.82)
	Not stressful at all	62	183	1	1
Suicidal ideation					
	Yes	34	40	2.58 (1.53, 4.37)	2.26 (1.29, 3.94)*
	No	75	228	1	
Anxiety					
	Yes	56	29	8.71 (5.10, 14.80)	6.13 (3.38, 11.13)*
	No	53	239	1	
Psychological distress					
	Yes	79	89	5.30 (3.25, 8.64)	2.89 (1.66, 5.02)*
	No	30	179	1	

*P<0.05.
AOR, adjusted OR; COR, crude OR.

depression. Accordingly, students who had very good interstudent relationship were 78% less likely to have depression compared with those who had poor relationships (AOR=0.22; 95% CI: 0.09, 0.55). Students who ever thought of suicide were more than two times at risk of depression than those who never thought of attempting suicide (AOR=2.26; 95% CI: 1.29, 3.94). Students who had anxiety disorder and psychological distress were 83.89% (AOR=6.13; 95% CI: 3.38, 11.13) and 65.40% (AOR=2.89; 95% CI: 1.66, 5.02) more likely to develop depression symptoms compared with their counterparts, respectively (table 4).

Factors associated with anxiety

Having a history of alcohol use, depression, psychological distress and suicidal thoughts was substantially related to anxiety disorder, according to the multivariable binary logistic regression analysis. Accordingly, students who had a history of alcohol use had a greater than twofold increased risk of having an anxiety condition than those who did not (AOR=2.87; 95% CI: 1.13, 7.28). Students who ever thought about suicide had a greater chance of acquiring anxiety disorder than those who had never considered suicide (AOR=3.23; 95% CI: 1.80, 5.79). Students who had depression symptom and psychological distress were 81.69% (AOR=5.56; 95% CI: 3.06, 9.72) and 65.40% (AOR=4.36; 95% CI: 2.33, 8.19) more likely to develop anxiety disorder compared with their counterparts, respectively (table 5).

Factors associated with psychological distress

In the bivariate binary logistic regression analysis, students' grade levels, having history of alcohol drinking, interstudent relationships, depression, anxiety and suicidal ideation were significantly associated with psychological distress. However, the grade level of the students, and their levels of depression, anxiety and suicidal ideation were still significant in the multivariable binary logistic regression analysis. Accordingly, when compared with students in grade 9, students in grade 12 were 74.16% more likely to experience psychological discomfort (AOR=3.87; 95% CI: 1.98, 7.55). Similarly, the odds of developing psychological distress were more than twofold among students who ever thought of suicide compared with those who never thought of suicide (AOR=2.86; 95% CI: 1.59, 5.12). Students who had depression symptoms and anxiety disorder were 70.15% (AOR=3.35; 95% CI: 1.92, 5.83) and 76.85% (AOR=4.32; 95% CI: 2.27, 8.24) more likely to develop psychological distress compared with their counterparts, respectively (table 6).

Table 5 Factors associated with anxiety disorder symptoms among Nemelifen Secondary and Preparatory School students, 2020

Variables		Anxiety disorder		COR (95% CI)	AOR (95% CI)
		Yes	No		
Had history of alcohol drinking					
	Yes	29	51	2.45 (1.43, 4.20)	2.87 (1.13, 7.28)*
	No	56	241	1	1
Suicidal ideation					
	Yes	32	42	3.59 (2.08, 6.21)	2.20 (1.16, 4.18)
	No	53	250	1	1
Depression					
	Yes	56	53	8.71 (5.10, 14.88)	5.46 (3.06, 9.72)
	No	29	239	1	1
Psychological distress					
	Yes	192	17	7.68 (4.30, 13.69)	4.36 (2.32, 8.19)
	No	100	68	1	1

*P<0.05.
AOR, adjusted OR; COR, crude OR.

Table 6 Factors associated with psychological distress symptoms among Nemelifen Secondary and Preparatory School students, 2020

Variables		Psychological distress		COR (95% CI)	AOR (95% CI)
		Yes	No		
Had history of alcohol drinking					
	Yes	52	28	2.90 (1.73, 4.85)	2.08 (0.87, 4.97)
	No	116	181	1	1
Grade level					
	9th	36	76	1	1
	10th	33	47	1.48 (0.82, 2.68)	1.34 (0.68, 2.66)
	11th	49	56	1.85 (1.07, 3.20)	1.66 (0.88, 3.10)
	12th	50	30	3.52 (1.93, 6.41)	3.87 (1.98, 7.55)*
Suicidal ideation					
	Yes	50	24	3.27 (1.91, 5.60)	2.86 (1.59, 5.12)*
	No	118	185	1	1
Interstudent relationship					
	Very good	82	130	0.36 (0.15, 0.84)	0.51 (0.19, 1.34)
	Good	70	70	0.56 (0.23, 1.36)	0.75 (0.28, 2.03)
	Poor	16	9	1	1
Depression					
	Yes	79	30	5.30 (3.25, 8.64)	3.35 (1.92, 5.83)*
	No	89	179	1	1
Anxiety					
	Yes	68	17	7.68 (4.31, 13.69)	4.32 (2.27, 8.24)*
	No	100	192	1	1

*P<0.05.
AOR, adjusted OR; COR, crude OR.

DISCUSSION

The total prevalence of depression in this study was 28.91% (95% CI: 24.32%, 33.48%), which was found to be in line with the findings of the Jimma study, a longitudinal survey of youths,[18] and Kombolcha residents.[19] Similar results were found in a research conducted among secondary school students in Nairobi, Kenya,[20] among Brazilian adolescents,[6] a study in Santiago (Chile)[21] and a review done in six developing countries (ie, from Africa (Zimbabwe and Lesotho), Asian (Indonesia and Pakistan) and Latin America (Brazil and Chile)) ranging from 20% to 30%.[22]

The severity of depression in this study, however, was greater than that reported in systematic reviews (ie, varying from 6.8% to 11%) conducted in Ethiopia.[9] It was also higher than other findings in rural Kenya (10.8%)[23] and Ugandan adolescents (8.6%).[8] Likewise, the finding of this study was higher than another study on the magnitude of major depressive disorder in the 12th grade students in India (19%).[24] These variations may be caused by socioeconomic differences, as the majority of studies found a link between indicators of poverty and the risk of depression,[22] which differ from country to country, and stressful environmental factors (such as the study area's location in a pastoralist and the hottest region of the nation).

In contrast, the magnitude of depression in this study was lower than the findings from Dessie Preparatory School where more than half of students reported depression at least once in the last 3 months before the study period.[10] The inclusion of only preparatory students in the Dessie study could be one explanation for the disparities. The upcoming difficult admission examinations for universities and increased parental pressure on their children to be achievers were thought to be the main causes of stress at this grade level.

Interestingly, the odds of having depression symptom were less likely among students who had very good and good interstudent relationships, and this was supported by a study done in South Korea[25] and Qatar.[26] The best explanation for this would be that students with bad peer relationships are more prone to depression and other problems in later life. In contrast, people who are good at socialising have the confidence to openly discuss any problems they may be having with their friends and classmates without worrying about being rejected or subjected to harassment.

Moreover, students with suicidal ideation had more than a twofold risk of developing depression than those never thought of attempting suicide. This conclusion was backed by a study, which found that suicide survivors experienced higher levels of self-perceived stigma, which raised their chance of developing mental disorder.[27] There is indication that some suicide survivors were at an increased risk of developing depression and suicidal ideation. They are exposed to the condition in the form of shame, blame and fear of avoidance. Also, spiritual beliefs and lack of social support could induce feelings of stigmatisation in suicide survivors.[27]

In this study, the overall magnitude of anxiety disorder was 22.5% (95% CI: 18.7%, 27.3%), which is in line with a similar study from Woldia Preparatory School.[12] Similarly, it is consistent with the systematic review from six low-income and middle-income countries that ranged from 20% to 30%,[22] and studies from the UK (20%)[5] and rural Zimbabwe (23.8%).[7] However, the magnitude of anxiety in this study was higher than the levels of overall mental disorders in the rural district of Kenya (10.8%).[23] This discrepancy might be due to the differences in sociodemographic and cultural features between these two countries. Most of our study participants were from urban settings. Additionally, in Ethiopia, shyness or fear as a measure of politeness has been emphasised as a dominant cultural norm. The community's perception towards shyness and politeness as a measure of predominant cultural norm might have high influence on students' anxiety status.

On the other hand, the magnitude of anxiety was lower than the studies conducted on common mental illness in residents of Jimma (33.6%)[28] and Kombolcha (32.4%).[19] The latter two studies used the Self-Reporting Questionnaire-20, which determines whether an overall mental disorder is present or not in general, which may account for these variances. But in our study, the GAD-7 Scale that is specifically for anxiety disorders was used. Moreover, the magnitude of anxiety was lower than the studies done in the 11th and 12th grade high school students in Kolkata, India (63.5%),[29] and Brazil (30%).[6] These discrepancies were due to differences in socioeconomic characteristics and on the latter studies, only preparatory students were included, which might increase the magnitude.

In this particular study, ever alcohol consumption and those who had suicidal ideation had a significant association with anxiety after controlling other factors. When compared with their peers, students with a history of alcohol use were nearly two times more likely to have an anxiety problem. Indeed, anxious adolescents are more likely to indulge in binge drinking and have alcohol abuse issues.[12] This finding was consistent with previous studies conducted in Debre Birhan University.[30] The students probably use alcohol as self-medication for their fear and for their concerns of negative evaluation by others.[12]

Besides, those students with suicidal ideation had more than a threefold risk of having anxiety disorder than those who claimed that they never thought of attempting suicide. This is supported by a study done on a sample of suicide survivors due to levels of perceived stigma toward them, predisposing them to increased risk of common mental illness.[27]

The magnitude of psychological distress in this study was 44.6% (95% CI: 39.6%, 49.6%), which was consistent with a study from Gondar (40.9%).[31] On the other hand, the magnitude of psychological distress was higher than studies from Jimma[28] and Kombolcha towns.[19] This difference was attributed to environmental factors where our study participants live in the hottest and developing

region of the country. Likewise, the finding of this study was higher than the findings of other studies done on common mental illnesses in rural Kenya[23] and Brazil.[6] This might be due to differences in sociodemographic and economic variations on those studies and this one. The magnitude of psychological distress stated in this study was still higher than from other epidemiological systematic literature reviews done in six middle-income and low-income countries (ie, 20–30%).[22] This discrepancy might be because most students have high level of stress, hormonal changes and low coping resources around these age groups. Those factors might have contributed for the magnitude of psychological distress in students.

Contrary to this, the magnitude of psychological distress found in this study was lower than the study done in Debre Birhan University.[30] This difference might be due to variations in the cut-off values used. In the report of Debre Birhan University, greater than or equal to 7 was taken as the cut-off value. The other possible explanation would be stress related to completion with peers as well as concern about the future and university-level courses were more stressful and demanding than secondary school.

On the other hand, grade level and suicidal ideation were significantly associated with psychological distress by controlling other confounding factors. Students attending grade 12 were 75.13% more likely to have psychological distress compared with those who are in grade 9. This is supported by a research done in Indian high schools.[24 29] Preparations for the national university entrance examinations and peer, teacher and parental pressure to succeed might have an influence on the student's psychological distress level. In addition to that, as age (level of grade) increases, so as the burden of common mental illnesses. Students are also concerned about peer approval and pressure.[1] Moreover, the risk of having psychological distress was more than twofold among students with suicidal ideation. This is supported by a study done on a sample of suicide survivors down to levels of perceived stigma toward them, predisposing them to increased risk of common mental illnesses.[27]

Above all, depression, anxiety and psychological distress were interdependent. According to this study, a student with depression was also more likely to develop anxiety and psychological distress. If students have anxiety, they were also more likely to develop depression and psychological distress; and a student with psychological distress was also more likely to develop anxiety and depression (tables 4–6). In support of these findings, according to the Anxiety Disorders Association of America report, about half of those who were diagnosed with depression were also diagnosed with an anxiety disorder, and most with depression experience some anxiety symptoms.[32] Comorbid depression and anxiety disorders occur in up to 25% of general patients. About 85% of patients with depression have significant anxiety, and 90% of patients with anxiety disorder have depression.[33] A study pinpointed that the likelihood of developing psychological distress among individuals diagnosed with depression was high and vice versa.[34] Studies showed that high level of psychological distress was indicative of impaired mental health and may reflect mental disorders, like depression symptoms and anxiety disorders.[35 36]

The study made an effort to address the magnitude and related factors of the three most prevalent mental disorders (ie, depression, anxiety and psychological distress) simultaneously and individually. Additionally, it ran an ROC curve analysis to verify a high sensitivity and specificity cut-off value. The study does, however, have certain cross-sectional study design drawbacks, such as the inability to clearly show a cause-and-effect relationship. As data were gathered by self-report, individuals were systematically more likely to give a socially acceptable response; hence, it is also not yet devoid of social desirability bias. Additionally, the study did not gather data on whether or not the students had taken the test or examination in the month prior to the start of the study.

Conclusion and recommendation

The magnitude of depression, anxiety and psychological distress was found to be high. Interstudent relationship had significant association with depression, while anxiety was associated with ever alcohol consumption. Likewise, psychological distress was associated with level of education. Suicidal ideation was associated with all the three dependent variables (ie, depression, anxiety and psychological distress). Not having good relationship with classmates, alcohol consumption, being in higher grade and suicidal ideation increase common mental illnesses. Above all, depression, anxiety and psychological distress were interdependent. Therefore, educating students on the psychosocial effects of alcohol use and fostering stronger relationships among students inside and outside of the classroom, especially in the higher grades, will help to reduce depression, anxiety and psychological distress. Additionally, promotion of guidance and counselling services, encouraging extracurricular events like clubs plus sports to boost relationships among students, giving training through clubs and mini media about the adverse effects of alcohol consumption and providing training and support for students in higher grades to alleviate distress are vital. Students with severe mental problems were advised to go to the hospital for treatment, as mental illness could also be treated.

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Patient consent for publication Parental/guardian consent obtained.

Ethics approval Letter of ethical clearance was obtained from Institutional Review Board (IRB) of Adama General Hospital and Medical College (reference number: AGHMCIRC/715/2020). Permission was granted from the selected high school, and Awash town administration education bureau. Each respondent was informed about the objective of the study. Written informed assent and written informed consent were obtained from students who are under the age of 18 years and from their parents, respectively. But, from those greater or equal to 18 years, only written informed consent was acquired and they were instructed not to write their names and any other personal identifier on the form. A separate box was placed on the way to the exit door to put the filled questionnaire by their own after they are done. Finally, the questionnaire was kept locked after the data entry. Students with severe mental problems were advised to go to the hospital for treatment, as mental illness could also be treated.

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REFERENCES

1 Global Health Estimates Licence CC BY-NC-SA 3.0 IGO ed. *Depression and Other Common Mental Disorders*. Geneva: World Health Organization, 2017.
2 Deribew A, Deribe K, Reda AA, *et al*. Do common Menal disorders decline over time in TB/HIV Co-infected and HIV patients without TB who Areon antiretroviral Treament *BMC Psychiatry* 2013;13:1–6.
3 Murphey D, Barry M, Vaughn B. Adolescent mental disorder, adolescent health highlight. *Child Trends* 2013:1–10.
4 Merikangas KR, Nakamura EF, Kessler RC. Epidemiology of mental disorders in children and adolescents. *Dialogues Clin Neurosci* 2009;11:7–20.
5 Elliott I, Breedvelt J, Chakkalackal L, *et al*. *Fundamental Facts About Mental Health*. United Kingdom: Mental Health Foundation, 2015.
6 Lopes CS, Abreu G de A, dos Santos DF, *et al*. ERICA: prevalence of common mental disorders in Brazilian adolescents. *Rev Saude Publica* 2016;50:14s.
7 Langhaug LF, Pascoe SJ, Mavhu W, *et al*. High prevalence of affective disorders among adolescents living in rural Zimbabwe. *J Community Health* 2010;35:355–64.
8 Kinyanda E, Kizza R, Abbo C, *et al*. Prevalence and risk factors of depression in childhood and adolescence as seen in 4 districts of North-Eastern Uganda. *BMC Int Health Hum Rights* 2013;13:19.
9 Bitew T. Prevalence and risk factors of depression in Ethiopia: A review. *Ethiop J Health Sci* 2014;24:161–9.
10 Shiferaw S, Fantahun M, Bekele A. Psychosocial problems among students in preparatory school, in Dessie town, North East Ethiopia. *Ethiop J Health Develop* 2006;20:47–55.
11 Melese B, Bayu B, Wondwossen F, *et al*. Prevalence of mental distress and associated factors among Hawassa University medical students, Southern Ethiopia: a cross-sectional study. *BMC Res Notes* 2016;9:485.
12 Mekuria K, Mulat H, Derajew H, *et al*. High magnitude of social anxiety disorder in school adolescents. *Psychiatry J* 2017;2017:5643136.
13 Gelaye B, Williams MA, Lemma S, *et al*. Validity of the patient health Questionnaire-9 for depression screening and diagnosis in East Africa. *Psychiatry Res* 2013;210:653–61.
14 Spitzer RL, Kroenke K, Williams JBW, *et al*. A brief measure for assessing generalized anxiety disorder arch internal medicine. *Arch Intern Med* 2006;166:1092.
15 Tedstone DD, Moran R, Kartalova-O'Doherty Y. *Psychological distress,mental health problem and use of health services in Ireland. HRB Research Series, 5th edn*. Dublin: Health Research Board, 2008.
16 Hem E, GrŁnvold NT, Aasland OG, *et al*. The prevalence of suicidal Ideation and suicidal attempts among Norwegian physicians. results from a cross-sectional survey of a nationwide sample. *Eur Psychiatry* 2000;15:183–9.
17 Ghasemi P, Shaghaghi A, Allahverdipour H. Measurement scales of suicidal Ideation and attitudes: A systematic review article. *Health Promot Perspect* 2015;5:156–68.
18 Jebena MG, Lindstrom D, Belachew T, *et al*. Food insecurity and common mental disorders among Ethiopian youth: structural equation modeling. *PLoS One* 2016;11:e0165931.
19 Yimam K. Prevalence of common mental disorders and associated factors among adults in Kombolcha town, northeast Ethiopia. *J Depress Anxiety* 2014;S1:1–6.
20 Khasakhala LI, Ndetei DM, Mutiso V, *et al*. The prevalence of depressive symptoms among adolescents in Nairobi public secondary schools: association with perceived maladaptive parental behaviour. *Afr J Psychiatry (Johannesbg)* 2012;15:106–13.
21 Araya R, Rojas G, Fritsch R, *et al*. Common mental disorders in santiago, chile. *Br J Psychiatry* 2001;178:228–33.
22 Patel V, Kleinman A. Poverty and common mental disorders in developing countries. *Bull World Health Organ* 2008;81.
23 Jenkins R, Njenga F, Okonji M, *et al*. Prevalence of common mental disorders in a rural District of Kenya, and socio-demographic risk factors. *Int J Environ Res Public Health* 2012;9:1810–9.
24 Verma N, Jain M, Roy P. Assessment of magnitude and grades of depression among adolescents in Raipur city, India. *Int Res J Med Sci* 2014;2.
25 Shin KM, Cho SM, Shin YM, *et al*. Effects of early childhood peer relationships on adolescent mental health: A 6- to 8-year follow-up study in South Korea. *Psychiatry Investig* 2016;13:383–8.
26 Al-Kaabi N, Selim NAA, Singh R, *et al*. Prevalence and determinants of depression among Qatari adolescents in secondary schools. *Fam Med Med Sci Res* 2017;6:1–8.
27 Scocco P, Preti A, Totaro S, *et al*. Stigma and psychological distress in suicide survivors. *J Psychosom Res* 2017;94:39–46.
28 Kerebih H, Soboka M. Prevalence of common mental disorders and associated factors among residents of Jimma town, South West Ethiopia. *J Psychiatry* 2016;19.
29 Deb S, Strodi E, Sun J. Academic stress, parental pressure, anxiety and mental health among Indian high school students. *Int J Psychol Behav Sci* 2015;5:26–34.
30 Haile YG, Alemu SM, Habtewold TD. Common mental disorder and its association with academic performance among Debre Berhan university students, Ethiopia. *Int J Ment Health Syst* 2017;11:34.
31 Dachew BA, Azale Bisetegn T, Berhe Gebremariam R, *et al*. Prevalence of mental distress and associated factors among undergraduate students of University of Gondar, Northwest Ethiopia: A cross-sectional institutional based study Plos one. *PLoS ONE* 2015;10:e0119464.
32 ADAA. *Anxiety Disorders Association of America 8730 Georgia Avenue Silver*. Spring, MD, 2021. Available: www.adaa.org
33 Tiller JWG. Depression and anxiety. *MJA Open* 2012;1:1–5.
34 Takita Y, Takeda Y, Fujisawa D, *et al*. Depression, anxiety and psychological distress in patients with pulmonary hypertension: a mixed-methods study. *BMJ Open Respir Res* 2021;8:e000876.
35 Viertiö S, Kiviruusu O, Piirtola M, *et al*. Factors contributing to psychological distress in the working population, with a special reference to gender difference. *BMC Public Health* 2021;21:1–17.
36 Cuijpers P, Smits N, Donker T, *et al*. Screening for mood and anxiety disorders with the five-item, the three-item, and the two-item mental health inventory. *Psychiatry Res* 2009;168:250–5.