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Psychological problems and the associated factors related to the COVID-19 pandemic lockdown among college students in Amhara Region, Ethiopia: a cross-sectional study

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ABSTRACT

Objective The central aim of this study was to assess the level of psychological problems among college students during school closure due to the emerging COVID-19 pandemic.

Design Institution-based, cross-sectional study.

Setting Colleges in the Amhara regional state of Ethiopia.

Participants Participants were college students (N=422, >18 years) who were actively enrolled in the selected colleges preceding the survey.

Methods Data entry was done using Epi Info V.7.02 and data analysis was done using SPSS V.24.0. Variables with a p value less than 0.25 in the bivariate analysis were entered into the multivariable logistic regression model. Model fitness was checked using the Hosmer-Lemeshow model fitness test. Statistically significant level was declared at p<0.05.

Outcome Level of psychological problem.

Results This study involved 408 students, with a response rate of 96.6%. In this study, 77.2%, 71.8% and 48.5% of students experienced depression, anxiety and stress-related psychological problems during the lockdown, respectively. The multivariable logistic regression model showed that being female (adjusted OR (AOR)=1.68, 95% CI 1.09 to 2.91), inadequate practice of prevention measures (AOR=1.74, 95% CI 1.01 to 3.02) and living in an urban residency (AOR=0.76, 95% CI 0.48 to 0.94) were independent predictors of psychological problems among students.

Conclusions The study revealed that the level of anxiety, stress and depression disorders is optimally high among college students. Therefore, local governments should develop effective psychological interventions for students. Moreover, it is important to consider the educational enrolment type and the academic year of students.

INTRODUCTION

Severe acute respiratory infection (SARS) is a group of respiratory tract infections caused by a beta coronavirus (SARS-CoV-2).[1] [2] COVID-19 is a family of SARS caused by a novel coronavirus first detected in December 2019

Strengths and limitations of this study

► School closure and stay-at-home declarations by the federal and lower government administrative exposed students to psychological problems.
► We used an internationally accepted tool to assess psychological problems: Depression, Anxiety and Stress Scale 21.
► In this study, 77.2%, 71.8% and 48.5% of college students experienced depression, anxiety and stress-related psychological problems, respectively.
► The study was limited to college students due to financial constraints and may thus not represent students from high schools and precollege schools.

in Wuhan, China. The WHO has declared this disease a global pandemic and by the end of June 2021 has caused an estimated 134 million cases and nearly 4 million deaths.[3] [4] According to the Ethiopian Public Health Institute report, there have been an estimated 265 350 confirmed cases and more than 3900 deaths in Ethiopia by the end of June 2021.

Countries across the globe have taken different preventive measures, including movement restrictions, home confinement, social distancing, lockdown and closure of schools, which led to increased psychosocial stress among the community, especially students.[5–9]

A study conducted in China revealed that 53.8% of the respondents experienced moderate to severe psychological crises, in which students were found to contribute a greater number than the larger communities.[10] Another study in China revealed that around 25% of college students experienced anxiety due to the pandemic.[11] A study also conducted in China revealed that 14.5%,

8.9% and 7.7% of the participants screened positive for anxiety, depression and stress, respectively.[12] Pieces of evidence had suggested that the pandemic resulted in loneliness, anxiety, depression, insomnia, suicide, impact on economic well-being, societal rejection, discrimination and stigmatisation among people.[9 13–15]

Ethiopia has taken different prevention and control measures to halt the spread of COVID-19. These include school closures, stay-at-home orders, keeping social and physical distances, placing hand-ashing basins in places where people commonly gather (banks, churches/mosques, markets), preparation of isolation centres, and establishment of state emergency at the national level.[16–18] However, there remains no specific intervention to address the psychological problems associated with COVID-19 in the country. Moreover, studies conducted across the globe that have investigated the psychological problems associated with the COVID-19 pandemic predominantly focused on healthcare workers and patients.[19–21] Therefore, this study aimed to generate evidence on the prevalence of psychological problems due to COVID-19 and its determinants among college students.

Specific objectives
► To determine the prevalence of psychological problems related to the COVID-19 pandemic lockdown (depression, anxiety and stress) among college students in Amhara Region, Dessie Town in July 2020.
► To identify the factors associated with psychological problems related to the COVID-19 pandemic lockdown.

METHODS
Study setting and participants
This community-based, cross-sectional study was conducted from 15 April to 15 May 2020 to assess the psychological problems related to the COVID-19 pandemic among college students studying at four randomly selected private and public colleges and universities, namely Dream Science and Technology College, Dandii Boru College, Unity University and Dessie Health Science College. These higher institutions are found in South Wollo Zone, Dessie City Administration. Dessie City Administration is located 401 km away from the capital city of Ethiopia, Addis Ababa. The city has eight private colleges, one private university and three public colleges, which accommodate 20 907 students in different fields of study.

All active students, registered for a second-semester academic year, and those 16 years of age and above were included in this study. Students who were seriously ill during the data collection period were not included in this study.

Sample size was calculated for both determinants and prevalence of psychological problems due to COVID-19 and the maximum sample size was considered for this study. Thus, the final sample size was determined using a single population proportion formula with the following

assumptions: 5% type I error, 95% CI and 50% proportion since there is no study on this problem in Ethiopia. Finally, the researchers added 10% to compensate for non-response of participants, arriving at a final sample size of 422.

$$n = \frac{(Za/z)^2 (P)(1-P)}{d^2}$$

where n=required sample size, Zα/2=critical value for normal distribution at 95% confidence level (1.96), P=proportion of psychological problems and d=0.05 (5% margin of error).

From a total of 12 colleges and universities found in Dessie City Administration, 4 higher institutions (3 colleges and 1 university) were randomly selected. The calculated sample size was proportionally allocated in each college based on the second-semester academic student number reports. To calculate the required number of participants from each college, we multiplied the total number of students actively learning in each college by the sampling fraction (n/N). The sampling fraction is approximately equal to six for all colleges. Accordingly, every sixth participant was selected using a systematic random sampling technique from each college registrar's office logbook.

Study variables
The dependent variable was the psychological problem related to the COVID-19 pandemic (yes/no) among college students and was assessed using the Depression, Anxiety and Stress Scale (DASS-21).

The independent variables were sociodemographic characteristics (age, residence, sex, marital status, educational level, field of study, income, family size, religion), knowledge, attitude and practice towards the preventive measures of COVID-19.

Data collection tools and procedures
The questionnaire was adopted from studies conducted before this study[11 22–24] and modified into context. The questionnaire was developed in the English language and consisted of sociodemographic characteristics, 20 items for knowledge, 8 items for attitude and 12 items for practice of preventive measures against COVID-19. The psychological problem was assessed using DASS-21,[25–27] which contains seven items for each psychological problem component. The tool was translated to the local language (Amharic) and back to English to keep their consistency. The tool was pretested on 5% (21 participants) of samples other than the selected colleges found in the town of Woldia and some amendments were made based on the pretest findings. Data were collected using both phone call and personal interviews. Phone call was used for students who are out of Dessie Town. Trained health professionals who were working out of the selected colleges approached the study participants.

Data management and analysis

Data were cleaned, coded and entered into Epi Info V.7.0.2 software and exported to SPSS V.24.0 for analysis. Descriptive statistics were done and the results were presented using text, frequency tables, figures and median with IQR.

Bivariate logistic regression analysis was done to assess the association between the dependent variable and each independent variable. The sociodemographic factors, knowledge, attitude and practice of preventive measures against COVID-19 were the factors included in the bivariate logistic regression analysis. Thus, independent variables with a p value of less than 0.25 were considered in the final model. Correlation between independent variables was assessed but we did not find any correlation between them. The model fitness was also checked using the Hosmer-Lemeshow model fitness test. Finally, multivariable logistic regression analysis was done to control for potential confounders and to identify the factors associated with the psychological problem due to COVID-19 among students. Statistical significance level was declared at p<0.05.

Operational definitions

Psychological problem was defined as students who have experienced all forms of psychological problems (ie, depression, anxiety and stress) related to the COVID-19 pandemic and was measured using DASS-21.[25–27] Here, the scales were classified as normal, moderate and severe for each psychological problem (depression, anxiety and stress). However, we merged moderate and severe scales together in each psychological problem measurement since the values for the moderate scale were minimal.

Knowledge level was defined as students who correctly answered 70% or more of the knowledge questions and were thus considered as students with good knowledge level. Students who correctly answered below 70% of the knowledge questions were considered to have poor knowledge.

Attitude level was defined as students who correctly answered 70% or more of the attitude questions and were thus considered as students with positive attitude. Students who correctly answered below 70% of the attitude questions were considered to have negative attitude.

Practice level was defined as students who correctly answered 70% or more of the practice questions and were thus considered as students with good practice level. Students who correctly answered below 70% of the practice questions were considered to have poor practice.

Patient and public involvement statement

No patients were involved.

RESULTS

Sociodemographic characteristics of participants

In this study, 408 participants were involved, with a response rate of 96.6%. The median age of the participants was 21 years (IQR 3). Of the total number of students, 155 (38.0%) lived in rural residences, 194 (47.5%) were female, 215 (52.7%) were learning Technical and Vocational Education and Training (TVET) or diploma-level training, and 340 (83.3%) were living with their families during the COVID-19 lockdown. In this study, the participants had a median total family size of 5 (IQR 3) (table 1).

Prevalence of psychological problems related to COVID-19

In this study, the overall prevalence of psychological problem among college students due to COVID-19 was 16.2% (95% CI 12.7% to 19.9%), which was measured using students' experience of all forms of psychological problems (anxiety, depression and stress disorders). Moreover, 315 (77.2%) students reported that they experienced depression disorder. Similarly, 293 (71.8%) and 198 (48.5%) students experienced anxiety and stress disorders, respectively (figure 1).

Determinants of psychological problems related to COVID-19 among students

The selection of variables to be entered into a multivariable logistic regression model was based on clinical significance, predictor variables with p<0.25 in the bivariable logistic regression and absence of multicollinearity between independent variables. In this study, the selected covariates included sex of participants, residence, field of study, living conditions, attitude level and practice of preventive measures against COVID-19 and were entered into the multivariable logistic regression analysis model. The multivariable logistic regression model was done with backward elimination methods.

In this study, the odds of psychological problems due to COVID-19 among female students were two times higher compared with male students (adjusted OR (AOR)=1.68, 95% CI 1.09 to 2.91). Students with inadequate practice of prevention and control measures experienced two times greater odds of psychological problems due to COVID-19 compared with students with adequate practices (AOR=1.74, 95% CI 1.01 to 3.02). Moreover, students living in an urban residency were 24% less likely to experience psychological problems compared with students currently living in rural areas (AOR=0.76, 95% CI 0.48 to 0.94). Field of study, living conditions and attitude towards COVID-19 were not significantly associated with the psychological problems associated with COVID-19 among students (table 2).

DISCUSSION

COVID-19 has affected global mental health, as evidenced by the accelerated increase in cases and deaths related to the pandemic worldwide.[28] In this study, the overall psychological problems related to COVID-19 among college students were measured using the experience of all forms of psychological problems (ie, anxiety, depression and stress disorders). Although the figure seems small, it represents the conjoined occurrence of psychological

Table 1 Sociodemographics, knowledge, attitude and practices of students towards COVID-19

List of predictors	Category of variables	Frequency (n)	%
Age of participants (in years)	16–20	166	40.7
	>20	242	59.3
Residence	Urban	253	62.0
	Rural	155	38.0
Sex of participants	Male	214	52.5
	Female	194	47.5
Marital status	Single*	360	88.2
	Married	48	11.8
Religion of participants	Orthodox	207	50.7
	Muslim	183	44.9
	Others†	18	4.4
Type of educational enrolment	TVET (diploma)	215	52.7
	Degree (first)	193	47.3
Programme	Regular	377	92.4
	Evening (extension)	31	7.6
Field of study	Health-related	233	57.1
	Business-related	129	31.6
	Technology-related	46	11.3
Academic year	Year 1	151	37.0
	Year 2	180	44.1
	Year 3	58	14.2
	Year 4+	19	4.7
Living with	Families	340	83.3
	Relatives	28	6.9
	Alone	21	5.1
	Others‡	19	4.7
Total family size (including extended families)	<5	198	48.5
	5+	210	51.5
Monthly income for education (in Ethiopian birr)	<1000	349	85.5
	1000–1500	47	11.5
	>1500	12	2.9
Knowledge level of students towards COVID-19	Poor	124	30.4
	Good	284	69.6
Attitude towards COVID-19	Negative	178	35.0
	Positive	230	65.0
Practice towards preventive measures against COVID-19	Poor	143	43.6
	Good	265	56.4

*Single: living together, divorced and widowed.
†Others: Protestant and Catholic.
‡Others: friends, sisters-in-law/sons-in-law.

disorders reported by students. Thus, this prevalence is optimal compared with other similar studies conducted in developing countries which measured the situation of the problem using the existence of either of the three psychological problems. Furthermore, the multivariable logistic regression model showed that residence, poor practice and sex of participants were independent predictors of psychological problems related to COVID-19 among college students.

In this study, the overall psychological problem among college students due to COVID-19 was 16.2%. This finding is lower than studies conducted in northern
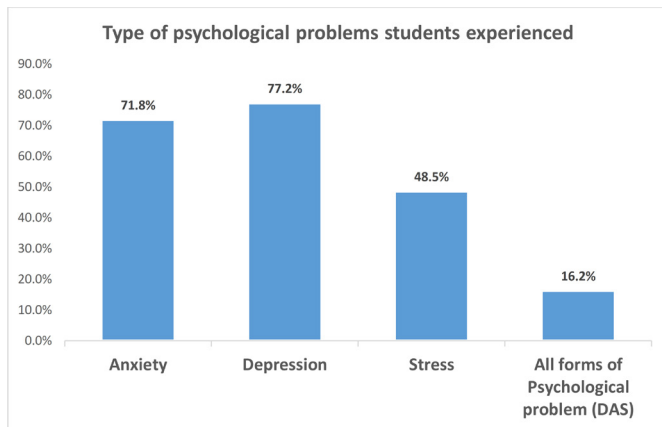
Figure 1 Types of psychological problems that students experienced during the COVID-19 lockdown. DAS, depression, anxiety and stress.

Ethiopia (85.3%),[20] University of Dhaka (43.4%),[29] Jilin Province, China (40.4%)[30] and in 194 cities in China (53.8%).[31] The COVID-19 outbreak has caused psychological problems[32] in the form of depression, anxiety and stress, which need provision of improved psychological interventions at the global, national, regional and district levels. The discrepancy might be due to differences in the measurement of the outcome variable (ie, psychological problem). In our study, psychological problem among students was measured using the coexistence of anxiety, stress and depression together, while in previous studies it was measured using either stress or anxiety or depression.

In our study, more than three-fourths (77.2%) of the students reported to have had experienced depression disorder during the pandemic-related lockdown. This finding is higher than studies conducted in Hubei Province,

China (37.1%),[33] in 194 cities in China (16.5%)[31] and in the findings of a systematic review (14.6%–48.3%).[34] Similarly, our study showed that nearly three-fourths (71.8%) of the students experienced anxiety disorders during the lockdown. This finding is higher than a study conducted in China which found only a quarter (25%) of college students presented with anxiety disorder,[11] a longitudinal study conducted in China (28.8%).[28] This finding is also higher than a study conducted in Hubei Province, China (29%),[33] findings of a systematic review (6.33%–50.9%)[34] and a study in 194 cities in China (28.8%).[31] Moreover, in this study, nearly half (48.5%) of the students experienced stress disorders during the lockdown. This finding is higher than a study conducted in Samara University, Northeast Ethiopia (53.2%),[35] findings of a systematic review (8.1%–81.9%)[34] and a study in 194 cities in China (8.1%).[31] In Ethiopia, the widespread outbreak of COVID-19 is directly associated with these adverse psychological consequences among college students, who are out of school due to the national lockdown and school closure orders. Thus, students are more likely to suffer from the fear of the possibility that schools might not open again. On top of this, most of the college students were coming from the countryside to attend schools in towns and the national lockdown policy was declared before these students went back to their home villages. As a result, these students were likely to suffer from the fear of acquiring the newly emerged disease, COVID-19, compared with other community members.

In this study, the odds of psychological problems due to COVID-19 among female students were two times higher compared with male students. This finding is similar to a study conducted in Hubei Province, China,[33] findings of a

Table 2 Factors associated with COVID-19-related psychological problems among college students in Ethiopia

List of variables	Category of variables	Psychological problems		COR (95% CI)	AOR (95% CI)
		Yes (%)	No (%)		
Residence	Urban	38 (57.6)	215 (62.9)	0.81 (0.47 to 1.37)	0.76 (0.48 to 0.94)*
	Rural	28 (42.4)	127 (37.1)	1.00	1.00
Sex of participants	Female	41 (62.1)	173 (50.6)	1.61 (0.93 to 2.75)	1.68 (1.09 to 2.91)*
	Male	25 (37.9)	169 (49.4)	1.00	1.00
Field of study	Health-related	35 (53.0)	198 (57.9)	1.00	1.00
	Business-related	23 (34.8)	106 (31.0)	1.23 (0.69 to 2.18)	1.38 (0.74 to 2.57)
	Technology-related	8 (12.1)	38 (11.1)	1.19 (0.51 to 2.76)	1.54 (0.63 to 3.77)
Living with	Family	61 (92.4)	279 (81.6)	1.00	1.00
	Others†	5 (7.6)	63 (18.4)	0.36 (0.14 to 0.94)	0.94 (0.25 to 3.48)
Attitude towards COVID-19	Negative	32 (48.5)	146 (42.7)	1.26 (0.76 to 2.14)	1.42 (0.81 to 2.51)
	Positive	34 (51.5)	196 (57.3)	1.00	1.00
Practice towards COVID-19	Inadequate	31 (47.0)	112 (32.7)	1.82 (1.07 to 3.10)	1.74 (1.01 to 3.02)*
	Adequate	35 (53.0)	230 (67.3)	1.00	1.00

*P<0.05.
†Others: alone, relatives and friends.
AOR, adjusted OR; COR, crude OR.

systematic review[34] and a study in Jilin Province, China.[30] In Ethiopia, female students are prone to gender-based violence and poor social and economic support.[35] Consequently, these conditions can easily lead them to lose their self-confidence and experience many stressors in life. Hence, they are more likely to suffer from psychological disorders (ie, depression, anxiety and stress) compared with their male counterparts.

This study revealed that students living in urban residences are 24% less likely to experience psychological problems compared with students currently living in rural areas. This finding is similar to a study conducted in China.[11] Students in urban residences had more exposure to the media where they can get real information about safety measures and other preventive measures forwarded by the government and the international communities. Therefore, students living in urban residences were less likely to develop psychological problems compared with students in rural residences, where adequate information about the existing situation is not accessible.

In this study, students with poor preventive practice experienced two times greater odds of psychological problems due to COVID-19 compared with students with adequate practices. Previous studies revealed that students out of school and at the final stage of graduation are more prone to many psychological crises,[8 30] which are due to poor adherence to the preventive measures against the COVID-19 pandemic.

Limitations of the study

This study mainly used self-reported questionnaires to measure psychiatric symptoms and did not make clinical diagnoses. This may overestimate the overall psychiatric symptoms, which in turn may increase the level of psychological problems among college students. Moreover, the study also shares the limitations of a cross-sectional study design.

CONCLUSION

In this study, the overall psychological problems among college students due to COVID-19 were comparable with other studies conducted across the developing world. Moreover, the level of anxiety, stress and depression disorders was optimally high among students. The multivariable logistic regression analysis showed residence, sex and level of preventive practice were independent predictors of psychological problems among students. Therefore, the Ministry of Science and Higher Education and local governments should develop effective strategies and interventions to address psychological problems among students. Moreover, it is important to consider the educational enrolment type and the academic year of students during the interventions.

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