

Psychological Impact, Early Behavioural Response to COVID-19 and Predictors Among Health Science Students in Amhara Region, Northwest Ethiopia

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Abstract: *Background:* Psychological impact of the Coronavirus 2019 (COVID-19) pandemic is a serious mental health problem for everyone, including health science college students who spend most of their times at home due to the closure of colleges. Addressing needs of early behavioral responses to this pandemic virus in the affected community particularly for students are very important. However, In Ethiopia, there is a paucity of evidence on the addressing psychological impact, early behavioral response to COVID-19. Therefore, this study aimed to assess the status of psychological impact, early behavioral response to COVID-19 and its associated factors among public health science college students, northwest, Amhara national regional State Ethiopia. *Methods:* An institutional-based cross-sectional study was employed among 317 respondents from October 16, 2020 to December 30, 2020. A systematic random sampling technique used to select the students who attending in public health science colleges in Amhara Regional state. Data were collected using an interviewer-administered structured questionnaire. Data were collected using an interviewer-administered structured questionnaire. Epi-data version 4.6 and SPSS version 20.0 software were used for data entry and analysis, respectively. Binary logistic regressions (Bivariable and multivariable) were performed to identify statistically significant variables. Adjusted odds ratio with 95% CI was used to declare statistically significant variables on the basis of p-value < 0.05 in the multivariable logistic regression model. *Results:* The overall status of psychological impact and early behavioral response to the COVID-19 pandemic among participants were 51.4% with 95% CI (46%-57%) and 51.1% with 95% CI (45%-57%) respectively. Age 18-24 years old (AOR: 3.6; (CI: 1.14-11.39)), urban residence (AOR: 0.51; 95% CI: (0.31-0.84)), being male participants (AOR: 1.72, 95% CI: (1.04-2.84)), participants evolved in Debre Tabor health science college (AOR: 4.25; CI 95% (1.60-7.72)) were significant predictors of psychological impact of COVID-19, whereas being female participants (AOR: 3.4; 95% CI: (1.95-5.14)), and participant had psychological impact of COVID-19 (AOR: 1.9; 95% CI: (1.16-2.96)) were significant factors with early behavioral response to COVID-19. *Conclusions:* The psychological impact of COVID-19 was higher among diploma students and early behavioral responses to prevent COVID-19 were not satisfactory. Hence, it is crucial track to early responses to the COVID-19 preventive measures, through appropriate information outlets, mainstream media, and relying on updating information from TV, radio, and health care workers about COVID-19 provision of behavioral readiness to COVID-19 prevention are very important. The government should implement national programs for school based health and safety, promoting students' psychological well-being.

Keywords: COVID-19 Pandemic, Early Behavioral Response, Psychological Impacts

1. Introduction

The Coronavirus Disease 2019 (COVID-19) is a viral pandemic that first time reported in Wuhan, China, in December 2019 and has spread all over the world [1]. Then, WHO declared this novel COVID-19 as a pandemic disease on March 11, 2020, and a public health emergency of international concern because of poses a high risk to countries with vulnerable health care systems [2]. Now COVID-19 pandemic has become a major concern for global health and registered as the largest outbreak of novel corona virus (2019-nCoV) or the severe acute respiratory syndrome corona virus 2 (SARS-CoV-2), since it rapidly spread from Wuhan, city province of China to the rest of the world [1]. The COVID-19 pandemics officially recognized in Ethiopia on 13 March 2020, after the Japanese arrived in Ethiopia from Burkina Faso trip, and tested positive for the novel COVID-19 [3].

According to case-fatality current reports, more than 2.5 million people have been getting infected, and more than 1.3 million deaths caused by corona virus globally [4] and the figures are still increasing rapidly almost all African countries have confirmed cases and the number of deaths is increasing [5-7].

The COVID-19 has shown different common symptoms, such as fever (not in all), dry cough, sore throat, headache, fatigue, headache, myalgia, shortness of breath, sore throat and conjunctivitis have been described, but severity characters range from mild to severe in individuals [8-10].

The World Health Organization (WHO) has designed different mechanisms to combat the spread of COVID-19 outbreaks in public health aspects, such as hand washing with soap or use of hand sanitizers, maintaining social distance and home stay to remain protected from the COVID-19 infection [11-13]. However, there is an inadequate number of hospitals, shortages in transportation, lack of personal protective equipment (PPE), sanitizer, masks and early psychological readiness, low community awareness and strong enforcement to decrease the initiated a screening program, established quarantine and treatment centers, of the virus in developing countries [14].

The Ethiopian ministry of health also designed an emergency task force was done the spread of the COVID-19 pandemic may be prevented by staying at home, social distancing, wearing masks, and applying hand hygiene, alongside city lockdown facilities (college, university and schools), early detection, prompt treatment, and the implementation of a robust system to trace contacts [8, 15]. The major challenge of this designed an emergency task force did not perceive the impact COVID-19 of mental health and the advantage of early behavioral response for this pandemic virus to peoples [16]. Since, identifying psychological wellbeing across countries and early response to the spread of the COVID virus were very necessary to compact impact of the COVID virus on humankind [17].

On the other hand, complicated means of COVID-19 pandemic prevention have affected social mental health have

psychosocial impacts on people. This is particularly serious for students, because college's student spends their times overlooked at home due to the closure of schools and they don access to information [18, 19]. If mental health complications are not well managed and make psychosocial readiness, it leads to the psychological distress like; fear, anxiety, suicidal attempts and negatively inhibits the learning process among the higher-risk groups of students [20, 21]. These showed that the COVID-19 outbreaks could affect mental health problems in the younger age groups students like; suicide, depression, distress, loss of their job, fear, worry, nervousness, and anxiety [22-24].

These provoking massive health measures to control the spread of the COVID-19 outbreak had a strong influence on the psychological impact, the economic social effect on the students, while separation from loved friends, educational system, the loss of freedom, staying in their homes, and uncertainty over disease status created dramatic adverse effects on mental health's [25, 26]. Since communities have get a lot of fake information through un scientific sources that might be potentially disturb the public behavioral response [27]. These tensions are further magnified by fear of being quarantined or having to deal with inadequacies of personal protective equipment and ventilators [28]. This showed that some health workers have described feeling coerced and trying in outbreak situations [29].

The prevalence of mental health threats to human beings may occur as a result of closed colleges, overlooked and detachment of daily learning activities without early behavioral response from this mental complication [30, 31]. In particularly, students, psychological readiness is very important to the early behavioral response towards the COVID-19 pandemics as emergency health measurements [32]. The other institutional based study in India stated that symptoms of the psychological impact of COVID-19 on participants were an increase in the symptoms of stress, anxiety, and more socially withdrawn or feelings of self-harm of students [33].

Previous studies revealed that age, marital status, and sex, internet access, fake information, protective measures are available, students were significantly associated with the psychological impact of COVID-19 [29, 33-36]. Similarly, age, residence, academic performance, year of study, and social support, level of awareness of COVID-19 was determinants of early behavioral response to prevent COVID-19 [37-39].

The Ethiopia ministry of education has a plane to reopen schools, colleges and universities after students stayed at home for 6 months without evidence of the status of psychological impact and early behavioral response to compact COVID-19 pandemics on students. Investigating the student psychological impact and understanding early behavioral response preventive measures of the COVID-19 pandemic are very important.

Therefore, determine the status of psychological impact, and early behavioral response to COVID-19 and identify their associated factors among health science college students

in Amhara regional state, Ethiopia. The findings of this study will help to design an effective intervention for the psychological impact and to make readiness to enhance behavioral response to COVID-19.

2. Methods

2.1. Study Setting

The study was conducted in the northwest of Amhara regional state, governmental health Science Colleges. It's located in Amhara Regional State, and is 748 km far from northwest of Addis Ababa, the capital of Ethiopia. There are five governmental health science colleges in Amhara Regional State. Of these, three governmental health Science Colleges are found in the northwest part of Amhara regional state. As Amhara regional health bureau reported, in three public health science colleges' the total 30035 graduates student every year, of which 1468 are males and 1567 are female students.

2.2. Study Design and Study Period

An institutional-based cross-sectional study was conducted from October 16 to December, 30, 2020 to assess the prevalence and determinants of the psychological impact and to enhance early behavioral response to COVID-19 among students in public health science colleges in the northwest, Amhara Region, Ethiopia.

2.3. Study Population and Eligibility Criteria

We included all students in the public health science colleges' northwest, Amhara region, Ethiopia. All selected students who attended in public health Science College, during the data collection period were included. Students, who were unable to respond, seriously ill were excluded from the study.

2.4. Sample Size Determinations and Sampling Procedures

The sample size was determined by using single population proportion formula based on the following assumptions: A 95% confidence level (1.96), the prevalence of psychological impact experienced by subjects during the last four weeks preceding the survey ($P=25\%$) which was taken from the previous study conducted in Ethiopia [32], 5% marginal error. The final sample size was 317 students, including a 10% non-response rate. In the northwest, Amhara regional state, there are three public health science colleges. Participants in all health science colleges were evolved to study. Proportion to size allocation was made to determine the required sample size for each health science college based on the average number of students at each college in the month proceeding the data collection period. Therefore, the allocated sample size from Teda Health Science College (103), Bahir Dar Health Science College (105), and Debre Tabor Health Science College (109). Lists of students from each the college's department were taken to prepare a

sampling frame.

A systematic random sampling technique was used to select study participants in each of the health science colleges. The sampling interval K^{th} value for each health science college was calculated by dividing the source population by the total sample size. Therefore, the sampling third interval was used in all health science colleges to select study respondents.

2.5. Study Variables and Data Measurements

The dependent variables were the psychological impact of COVID 19 and its early behavioral response among public health science students. The independent variables included socio-demographic variables such as age, gender, marital status, profession, and current place of residency of students. Data were collected using an interviewer-administered structured questionnaire. The questionnaire was adapted from Google, prepared in English for an online survey then translated into Amharic (local language) and then back to English to ensure consistency. Nine diploma holder female midwives as data collectors and one BSc holder midwife as supervisor were recruited for the data collection process. The data collectors and the supervisor practiced all the necessary precautions, such as practicing hand hygiene, physical distancing, and wearing a face mask to avert the risk of acquiring the infection from the study participants.

The psychological impact of the COVID-19 pandemic and its early behavioral responses among health science college students were measured using questions adapted from the WHO survey tool [14] and guidance [40]. The mean score value was used to determine the level of psychological impact and early behavioral responses among students. Students' level of psychological impact was categorized as low and high psychological impact based on the mean score value which was 16.6%. Therefore, a high psychological impact was reported when the students' mean score value was $\geq 16.6\%$ otherwise students had a low psychological impact. Students' early behavioral response to the COVID-19 was also categorized as poor and good early behavioral responses based on the mean score value which was 13.6%. Good early behavioral responses were reported when student's mean scores value was $\geq 13.6\%$ otherwise students had poor early behavioral responses.

2.6. Data Collection Tools and Procedures

Data regarding socio-demographic, information exposure, risk perception of COVID-19, and precaution measures adaptation and students' early behavioral response to COVID-19 were collected through a face-to-face interview using a structured questionnaire adapted from different literature. Respondents were asked about the sources of information to COVID-19 and how much they trusted those sources. They were also asked about the types of information that they wanted to receive. Participants were interviewed about whether they performed precautionary measures including avoiding handshaking, adopting hand washing, and

practicing physical distancing.

Data were collected by BSc midwives and strictly followed by supervisors who managed the overall data collection process. All responses to closed and open questions were written down manually by the interviewers. The supervisors assessed the consistency and completeness of the data on a daily basis.

2.7. Data Analysis

Data were entered into Epi-Data version 4.6 and then exported to SPSS version 20.0 software for analysis. Frequency tables were used to summarize demographic characteristics and prevalence of psychological impact. Bivariate logistic regression was performed separately for each independent variable. Independent variables with a p -value < 0.25 were entered into the final model for multivariable analysis. Variables in the mutually adjusted multivariable model with a two-sided p -value < 0.05 were considered statistically significant. Crude and adjusted odds ratios with 95% CI were computed to assess the level of association between dependent and independent variables.

2.8. Data Quality Management

To assure the quality of the data, the tool was prepared first in English and then translated into the local language (Amharic) by language experts in English and Amharic languages for consistency. A one-day training was given to data collectors and supervisors on the objective of the study, tool, and how to collect the data by the principal investigators. A pretest was done before the actual data collection period at Blue Nile Health Science College. Appropriate modifications such as unclear questions and ambiguous wording, changing terms, rephrasing for better understanding, deleting, and adding some information for clarity were made to the tool accordingly. Data collection was closely monitored by investigators and supervisors. Each data collector checks the questionnaire from each study participant for completeness daily to ensure data quality. Each questionnaire was reviewed and checked for completeness daily by the supervisors and principal investigators. Hosmer and Lemeshow goodness-of-fit test was used to check model fitness.

3. Results

3.1. Socio-demographic Characteristics

A total of 317 students participated in the study with a response rate of 100%. Of all participants, the majority (60.6%) of them were male. One hundred thirty four (42.2%) student's age were found to be the range of 18-24 years old. Regarding marital status, more than half of the students who participated in the study were single. Of all study participants, 58.0% of them were rural residents, and 34.7% of them were earned families a monthly income <1500 Ethiopian Birr (Table 1).

Table 1. Socio-demographic characteristics of psychological impact and early behavioral response to COVID-19 pandemics among health science college students Amhara state of Ethiopia, 2020, (N=317).

Variables	Category	Frequency	Percent (%)
Ages	18-24	134	42.2
	25-31	82	25.9
	32-38	64	20.2
	≥ 39	37	11.7
Sex	Male	192	60.6
	Female	125	39.4
Marital status	Single	180	58.8
	Married	86	27.1
	Divorced	42	13.2
	Windowed	9	2.8
Religion	Orthodox	150	47.3
	Muslim	79	24.9
	Protestant	47	14.8
	Catholic	41	12.9
Department	Laboratory	67	21.1
	Environment	61	19.2
	Pharmacist	53	16.7
	Nurse	44	13.9
Type of study area	HIT	37	11.7
	Health excitement	32	10.1
	Midwife	23	7.3
	Teda HSC	103	32.5
Residence	Debre tabor HSC	105	35.1
	Bahir Dar HSC	109	34.4
	Rural	184	58
	Urban	133	42
Family income	<1500	110	34.7
	1501-2500	98	30.9
	2501-3500	73	23.0
	>3500	36	11.4

3.2. Psychological Impact of the COVID-19 Pandemics

The findings demonstrated that, more than half of the study participants (51.4% 95% CI: (46%, 57%)) had high psychological impact to COVID-19 pandemics (figure 1).

Among prevention methods the majority of them 286 (90.2%) had got information from social media about COVID-19 pandemics. Among this, 81.7% heard from health care providers. Of all students, 55.8% of them had proper hand washing practice with water and soap, 71.9% of had perceived that avoiding touching nose, eye, and face with unwashed hands, and about 60.9% of them feel confident always covering mouth and nose during coughing and sneezing with bend elbow made them safe from COVID 19 infection.

About more than 59.9% of the respondents reported that maintaining at least 2-meter physical distance between individuals can protect them from acquiring COVID-19 infection and 90% of them had the skills to adhere recommended hand washing procedure to prevent COVID-19

infection (Table 2).

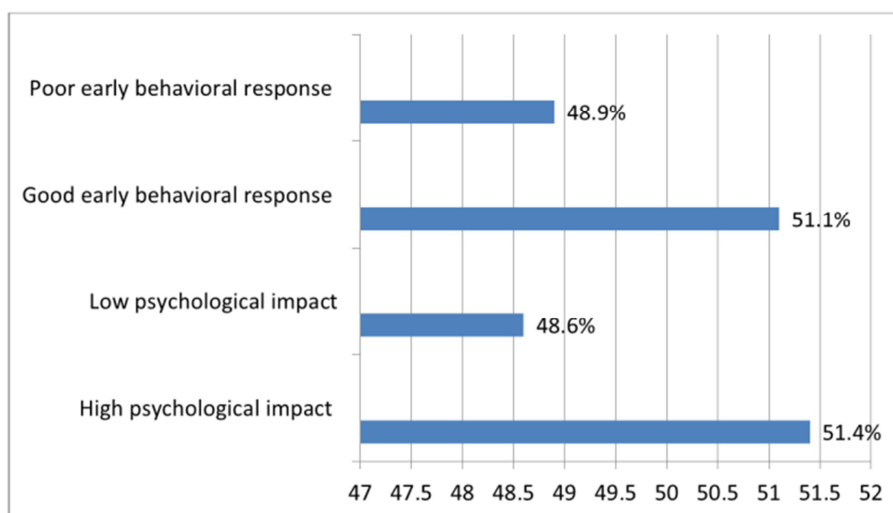


Figure 1. Prevalence of psychological Impact and early behavioral response to COVID-19 Pandemic.

Table 2. Frequency distribution of psychological impact towards COVID-19 pandemics among health science college students Amhara state of Ethiopia, 2020 (N=317).

Had psychological impact of COVID-19?	Yes (%)	No (%)
Getting information from social media?	286 (90.2)	31 (9.8)
Getting information from health care workers?	259 (81.7)	58 (18.3)
Confident that can wash my hands frequently with soap and sanitizer?	177 (55.8)	140 (44.2)
Have the resource (water, sanitizer and soap) to wash my hands?	201 (63.4)	116 (36.6)
Confident that I can stay at home easily to prevent COVID-19?	182 (57.4)	135 (42.6)
Confident that I can save from crowed places and close contact?	185 (58.4)	132 (41.6)
Always cover during coughing using the bend of my elbow?	175 (55.2)	142 (44.8)
Avoid touching my eyes, nose and mouth to prevent infection of COVID-19?	228 (71.9)	89 (28.1)
Maintain at least 2-meter physical distance to other individuals	190 (59.9)	127 (40.1)
Believing that COVID19 is extremely non cure	259 (81.7)	58 (18.3)
Have confidence taken preventive measures to prevent COVID-19 infection	204 (64.4)	113 (35.6)
Concerns about other family members a getting COVID-19	148 (46.7)	168 (53.3)

3.3. The Early Behavioral Response to COVID-19 Pandemics

The findings of this study indicated that more than half of the study participants (51.1%) 95% CL: (45%, 57%) had good early behavioral response to COVID-19 pandemics. More than two-thirds 63.4% of students were covering their mouths when coughing and sneezing and 88.6% of them had washed their hands properly with soap and water more often than usual time to reduce the spread of COVID 19. A majority, 88.0% of

students avoiding sharing their utensils to prevent transmission of the virus although 60.3% of them did not wear face masks regardless of the presence or absence of symptoms of COVID 19. About 41.6% of the students were still going to crowded public transport /places and about 68.5% of them had stayed at home due to lockdown prevention standards. About 61.1% of the participants did not maintain better indoor ventilation in the health care system, while 67.8% of students had experienced good ventilation in their house to prevent COVID-19 transmissions (Table 3).

Table 3. Prevalence of early behavioral response to COVID-19 pandemics among health science college students, Amhara state, Ethiopia, 2020 (N=317).

Early behavioral response	Yes (%)	No (%)
Is covering mouth when coughing and sneezing?	201 (63.4)	116 (36.6)
Avoiding sharing of utensils during means?	279 (88.0)	38 (12.0)
Do you wash hands with soap and water more often than usual?	281 (88.6)	36 (11.4)
Do wash immediately after coughing, rubbing nose, sneezing?	261 (82.3)	56 (17.7)
Washing hands after touching contaminated objects and patients?	205 (64.7)	112 (35.3)
Wearing mask regardless of the presence or absence of symptoms?	126 (39.7)	191 (60.3)
Do avoid eating outside on café or hotel?	100 (31.5)	217 (68.5)
Do you avoid public places / transport?	132 (41.6)	185 (58.9)
Have you maintain better indoor ventilation on health care?	102 (32.2)	215 (67.8)
Do you increase surface cleaning in health care?	266 (83.9)	51 (16.1)

3.4. Factors Associated with Psychological Impact of the COVID-19 Pandemics

Using multiple logistic regression analysis the following variables were found to be significantly associated factors with the psychological impact of the COVID-19 pandemic on students. These were age, gender, residence and students who were involved in the Debre tabor health science college were significantly associated with psychological impact of COVID-19 outbreaks. The odds of being high psychological impact of the COVID-19 among category (18-24years) old

participants were 3.6 times more likely than other age's category groups (AOR=3.6; CI: (1.140-11.391)), while age range 24-29 years old had 2.70 lower odds of having a high psychological impact of COVID-19 infections (AOR=0.37; 95% CI:(0.160-0.852)).

Being male participants had 1.72 times higher odds of having a high psychological impact due to the COVID-19 than female participants (AOR=1.72; 95% CI: 1.037-2.840)) (Table 4).

Table 4. Bivariate and multivariable logistic regression analysis of factors associated with psychological impact of COVID-19 among health science college students, Amhara state of Ethiopia, 2020 (N=317).

Variables	psychological impacts of COVID-19		COR (95% CI)	AOR (95% CI)
	Low	High		
Ages				
18-24	64	70	3.68 (1.044-11.465)	3.6 (1.140-11.391)*
25-31	38	44	0.42 (0.159-0.917)	0.37 (0.160-1.152)
32-38	31	33	0.66 (0.342-2.013)	0.71 (0.304-1.639)
≥39	21	16	1	1
Sex				
Female	75	50	1	1
Male	88	104	1.77 (1.138-3.327)	1.72 (1.037-2.840)*
Religion				
Orthodox	63	87	0.46 (0.225-1.372)	0.98 (0.393-2.465)
Muslim	38	41	0.59 (0.421-3.343)	1.0 (0.390-1.566)
Protestant	28	19	0.94 (0.305-1.545)	0.54 (0.247-1.199)
Catholic	25	16	1	1
Residence				
Rural	82	102	1	1
Urban	81	52	0.52 (0.305-0.912)	0.51 (0.306-0.838)*
Department				
Environment	34	27	1	1
Laboratory	30	37	1.55 (0.597-2.114)	1.36 (0.597-3.089)
Pharmacist	22	31	1.77 (0.904-5.245)	2.24 (0.939-5.359)
Nurse	26	18	0.87 (0.495-3.111)	1.25 (0.502-3.113)
HIT	19	18	1.19 (0.402-2.742)	1.06 (0.394-2.845)
Health Excitation	21	11	0.66 (0.335-2.933)	0.93 (0.326-2.658)
Midwife	11	12	1.37 (0.267-2.674)	0.83 (0.265-2.622)
Study area				
Teda HSC	59	44	1.58 (0.839-3.172)	1.78 (0.973-3.264)
Debre Tabor HSC	52	53	1.16 (1.943-7.278)	4.25 (2.304-7.842)*
Bahir Dar HSC	50	59	1	1
Family income				
<1500	59	51	0.74 (0.255-1.511)	0.68 (0.287-1.626)
1500-2500	49	49	0.64 (0.260-1.531)	1.65 (0.271-1.551)
2501-3500	24	49	0.31 (0.122-0.810)	0.33 (0.129-0.826)
≥3500	22	14	1	1

HSC=Health Science College, *p-value <0.05

3.5. Factors Associated with an Early Behavioral Response to COVID-19

Using multivariable logistic regression analysis, the following variables were found to be significantly associated with an early behavioral response to COVID-19. Gender and itself level of high psychological impact were found to be associated predictors of good early behavioral response to prevent the spread of the COVID-19 infections.

The odds of good early behavioral response to reduce COVID-19 infection was 3.4 times higher among male students compared with female students (AOR: 3.4; 95% CI:(1.945-5.137)), and students who had a high psychological impact of COVID-19 were 1.9 times more likely to have a good early behavioral response to compact the COVID-19 pandemics (AOR: 1.9; 95% CI: (1.16-2.96)) (Table 5).

Table 5. Bivariate and multivariable logistic regression analysis of factors associated with prevents COVID-19 pandemics among health science college students, Amhara regional state, Ethiopia, 2020 (317).

Variables	Early behavioral response to COVID-19		COR (95% CI)	AOR (95% CI)
	Good	Poor		
Age groups				
18-24	65	69	0.89 (0.482-3.694)	1.26 (0.466-3.424)
25-31	40	42	1.03 (0.571-2.816)	1.23 (0.539-2.789)
32-38	32	32	1.00 (0.591-3.140)	1.26 (0.549-2.899)
≥39	18	19	1	1
Sex				
Female	83	42	2.83 (2.112-6.077)	3.42 (1.945-5.137) *
Male	79	113	1	1
Department				
Environmental	31	30	1	1
Laboratory	31	36	1.20 (0.623-3.054)	1.31 (0.607--2.612)
Pharmacist	29	24	0.86 (0.404-2.107)	0.94 (0.433-2.031)
Nurse	21	23	1.13 (0.515-2.975)	1.01 (0.482-2.450)
HIT	16	21	1.36 (0.688-0.4.253)	1.48 (0.626-3.231)
Health excitement	23	9	0.40 (0.162-1.233)	0.38 (0.140-3.493)
Midwife	11	12	1.13 (0.311-2.662)	0.98 (0.364-2.753)
Study area				
TedaHSC	59	44	0.62 (0.325-1.167)	0.67 (0.355-1.143)
Debre tabor HSC	53	52	0.99 (0.529-1.884)	0.95 (0.525-1.731)
Bahir Dar HSC	50	59	1	1
COVID-19 Psychological impact				
Low	87	67	1	1
High	75	88	1.52 (1.239-3.736)	1.9 (1.156-2.964) *

4. Discussion

The current revealed that the prevalence of psychological impact of COVID-19 and early behavioral responses to COVID-19, and its associated factors among health science college students in Northwest, Amhara regional state since the beginning of the outbreak in Ethiopia in March 13, 2020.

About 51.4% with 95% CI (45%, 57%) of students reported psychological impact of the COVID-19, while 51.6% with 95% CI (46%, 57%) had early behavioral responses to the COVID-19 outbreaks.

The prevalence of the psychological impact of COVID-19 on students in this study was higher than in a study conducted in Ethiopia, 44.4% [32]. This might be due to the currently increase number of COVID-19 cases. For instance, as the Ethiopia ministry of health reported (August 22/10/2020) pandemic COVID-19 was a total of 91,693 cases and 1,396 deaths. The other considerable difference might be the use of different tools and method to assess this psychological distress and the different study participants. For instance, a study in that made Google online data collection method was conducted.

The prevalence of early behavioral responses to compact the COVID-19 pandemic in this study was in line with the findings of study conducted in Jimma, Southwest, and Ethiopia [25].

Regarding the demographic characteristics like; 18-24 age, female in gender, urban residence, and students' evolved in study area were significantly associated factors with high psychological impact to the COVID-19 pandemic among students. The odds of psychological impact to the COVID-19

pandemic was almost four times higher among student who found age between 18-24 years old for the high impact of COVID-19 pandemic as compared with those student who had a low impact of COVID-19 pandemic. This finding was supported by a study conducted in Australia [41] and in Ethiopia [42] participants who found that young age had a greater psychological impact to COVID-19 pandemic than their counterparts. This result was also similar to a comparison study conducted in Korea, Ethiopia, and Congo showed that poor information about preventive measurements of COVID-19 as compared to counterparts [43]. This might also due to the fact that young and middle-aged adults were most at risk and were coping less well with the consequences.

Accordingly, male participants were significantly associated with the high psychological impact of COVID-19 than female participants (AOR=1.72; 95% CI: (1.037-2.840)). This finding is in line with studies conducted in the Netherlands [44] China [27] and Iran [45]. The possible justification might be that majority of males work outside their home by moving from one place to another place. In addition to this, because male students move from place to place more often, they use transportation services, which will be difficult to comply with physical distancing. Therefore, men might be exposed to high stress from COVID-19 outbreaks. On the other hand, in our context, females bear a huge burden of childcare, so they may fear transmitting the disease to their children if they didn't have early behavioral response to compact the COVID-19. Therefore, females might be behavioral response to the national of COVID-19 outbreaks.

This finding also showed that the students who lived in

urban area were associated with the high psychological impact of COVID-19. Those respondents who live in urban area were 0.51 times less likely to have a high psychological impact on students than those respondents who live in rural areas (AOR=0.51, 95% CI: 0.306-0.838). This study is in line with the study was conducted in Addis Ababa [46]. This might be due to access to information or knowledge differences about the transmission and prevention of COVID-19. In addition to this, precautionary measures and psychological readiness for early behavioral response are important to prevent the COVID-19. Hence, when the study participants had high psychological stress from COVID-19, they were preventive in early response to this outbreak and by adherence by not traveling to crowded places and staying at home.

This study also revealed students who participated in Debre Tabor health science college were 4.25 times more likely to have a high psychological impact of COVID-19 than their counterparts (AOR=4.25, 95% CI: (2.304-7.842)). The possible explanation for this difference might be related to the pre-information the way how to prevent the COVID-19 pandemics.

Finally, our findings identified that students had high prevalence of psychological impact of COVID-19 was a significant associated factor with early behavioral response to prevent corona viruses. These findings are in line with the studies conducted in different countries [43, 47, 48]. A possible explanation for this similarity might be the study participants who had a high psychological impact of COVID-19 score on the early behavioral response to prevent this viruses were more likely to have an urgent response to prevent COVID-19. The other possible explanation for this anxiety may influence behavioral responses to the belief of being infected.

Limitation

The study acknowledged some important possible limitations that should be considered when interpreting the results. First, the study was cross-sectional, a design that does not permit establishing cause-effect relationships. Second, social desirability and recall bias might be introduced.

5. Conclusions and Recommendation

Our findings have indicated that, more than half of the participants were highly psychologically impacted by COVID-19 and had poor early behavioral response to prevent corona viruses.

Age, gender, residence, and type of participating study area were significant factors of psychological impact on COVID-19. Gender and participants who had high psychological impact on COVID-19 were also factors in early behavioral response to COVID-19 outbreaks. Therefore, it is crucial to increase mental health awareness, gender-based intervention strategies, and relevant coping mechanisms for students from varied backgrounds that may help the participants cope with the issues related to mental health, during learning. There is a need to develop gender

based intervention plan for this psychological problem in the population, mainly targeting those who do not get information from social media and those who did not adequately practice infection prevention and control measures to prevent the COVID-19 pandemic. The government should develop and implement national programs for school based health and safety, improve psychological well-being, and protect students from physical and mental hazards to take care of the mental health of students during this pandemic.

Declaration

Ethical Considerations

Ethical approval was obtained from the Ethical Review Committee of Amhara Public Health Institution (APHI). After an official letter had been submitted to the North Gondar zonal health department's office, permission letters were collected from both the North Gondar zonal health department's office and each health facility office. Informed verbal consent was obtained from the study participants. Names or specific addresses of the study participants were coded and kept anonymous, and confidentiality was assured. Their rights not to participate, not to answer any or all questions, and to withdraw from the interview at any time they want were respected.

Abbreviations

AOR, Adjusted Odds Ratio; CI, Confidence Interval; COR, Crude Odds Ratio; COVID-19, Corona virus disease 19; PPE, Personal Protective Equipment; SARS, Severe Acute Respiratory Syndrome; SPSS, Statistical Package for Social Sciences; TV, Television; WHO, World Health Organization

Consent for Publication

Not applicable.

Availability of Data and Materials

The dataset analyzed during the current study is available from the corresponding author on reasonable request.

Conflict of Interest Statement

The authors declare that they have no competing interests

Authors' Contributions

AM- was involved in the conception and design of the research project proposal, collect, analyzes, interpret the data and results and preparation and critical review of the manuscript. Other author (GM) was involved in reviewing the research project proposal and interpretation of results as well as preparation and critical review of the manuscript.

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