

# Assessment of undergraduate student knowledge, practices, and attitude towards COVID-19 in Debre Berhan University, Ethiopia

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## Research Article

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# Abstract

## Abstract

**Background:** Novel coronavirus-2019 (COVID-19) is a highly infectious disease that has caused a global pandemic. As of April, 2020, there were 74 confirmed cases of COVID-19 in Ethiopia, but none in Debre Berhan where this study was conducted. Under these conditions we sought to assess what undergraduate students at Debre Berhan University knew about COVID-19 and how it shaped their attitudes and practices regarding this disease.

**Methods:** A cross-sectional survey was conducted from March 18–24, 2020 among undergraduate students at Debre Berhan University. The data were checked for completeness, coded, entered into Epi Data VS 3.1, and then exported into STATA™ Version 14 software for analysis. Descriptive statistics were used to describe the relationship between study participants and the relevant variables. Binary logistic regression analyses were used to identify factors. Factors were selected with a backward stepwise method. Adjusted odds ratios (AORs) and their 95% confidence intervals (CIs) were used to assess the associations between variables and knowledge, attitude and practices (KAP). Variables with a p value  $\leq$  0.05 following multivariable analysis were considered significant.

**Results:** A total of 546 participants were included in this study with a mean age of 21.74 years old. In this study, approximately 73.8% of the study participants were knowledgeable about COVID-19 and their overall attitude was favorable. However, most participants showed poor practices in terms of containing potential virus outbreaks. In our multivariable analyses, people 25 and older (AOR = 1.6, 95%CI; 1.2, 4.6) and those who lived in urban areas (AOR = 4.3, 95%CI; 2.6, 15.8) were significantly associated with being knowledgeable about COVID-19. Moreover, we found that the source of information about COVID-19 (AOR = 2.3, 95%CI; 1.6, 8.7) was significantly associated with the attitude undergraduate students had about COVID-19.

**Conclusion:** The undergraduate students at Debre Berhan University were moderately knowledgeable about COVID-19 and had an optimistic attitude towards its resolution. However, this optimism may be leading to poor public health practices within this community. Therefore, greater efforts need to be made through educational campaigns to inform the public of the necessity for proper practices in containing this disease.

## Background

The novel coronavirus-2019 (COVID-19) is a newly discovered infectious disease that can cause severe illness in humans [1]. COVID-19 was first detected in December 2019 in Wuhan, China, and quickly spread around the world. The main clinical symptoms of this disease include fever, dry cough, fatigue, myalgia, and dyspnea. In China, 18.5% of the patients with COVID-19 developed a severe form of the disease,

which is characterized by acute respiratory distress syndrome, septic shock, metabolic acidosis, and bleeding. In more severe cases, infection can cause pneumonia, severe acute respiratory syndrome, kidney failure, and even death [2, 3].

As of April 14, 2020, there were 1,925,528 confirmed cases of COVID-19 globally and 119,718 deaths (~6.2%) [4]. This death rate is particularly alarming as the seasonal flu generally kills far fewer than 1% of those infected. The COVID-19 pandemic is the most recent of a number of public health emergencies caused by different pathogens and the World Health Organization (WHO) has declared it the sixth public health emergency of international concern since the beginning of this century, following H1N1 (2009) [5], polio (2014), Ebola in West Africa (2014)[6], Zika (2016), and Ebola in the Democratic Republic of Congo (2019) [7].

According to the last statement from World Health Organization (WHO), near to two million cases have been reported in more than 2214 countries worldwide, and the numbers of infected cases increase gradually. However, more than half of reported cases were detected in China [8]. Globally, about 6.2% of reported COVID-19 cases have died. By comparison, seasonal flu generally kills far fewer than 1% of those infected[9]

A study in China showed that most respondents were knowledgeable about COVID-19 and the vast majority of the participants also held an optimistic attitude towards the COVID-19 pandemic. Specifically, 90.8% believed that COVID-19 would be successfully controlled, and 97.1% had confidence that China could win the battle against the virus [10].

Given the severity of the public health emergency facing most countries, the WHO has called for collaborative efforts within and between countries to prevent the rapid spread of COVID-19 [8]. The WHO set the following strategic objectives for combatting this disease: (1) Limit human-to-human transmission of COVID-19 by taking measures to reduce secondary infections among close contacts and health care workers; (2) Prevent disease transmission from high-burden countries (e.g., China) by limiting travel to and from these regions; (3) Identify, isolate, and care for patients early, including providing optimized care for infected patients; (4) Identify and reduce the transmission of COVID-19 from the animal source; (5) Address crucial unknowns regarding clinical severity, extent of transmission and infection, and treatment options; (6) Accelerate the development of diagnostics, therapeutics, and vaccines; (7) Communicate critical risk and event information to all communities; (8) Counter misinformation and minimize the social and economic impact of COVID-19 through multi-sector partnerships [4] [11, 12]. With respect to individuals, standard recommendations to stop the spread of COVID-19 include regular hand washing, covering mouth and nose when coughing and sneezing, thoroughly cooking meat and eggs, and avoiding close contact with anyone showing symptoms of respiratory illness such as coughing and sneezing [1]. Additionally, many public health agencies indicate that the spread of the disease can be controlled if cases are rapidly identified, diagnosed, and managed, COVID-19 patient contacts are identified and notified, health care settings practice adequate infection

prevention and control, countries institute public health measures for travelers, and public awareness is raised regarding the risks and recommended safety measures [4].

A study in China revealed that in order to achieve the desired control of COVID-19, adherence to control measures was essential, which is largely affected by people's knowledge, attitudes, and practices (KAP) towards the disease [13]. Given this fact, we sought to assess the KAP of Debre Berhan University (DBU) students towards COVID-19. Notably, in Ethiopia, as of April 13, 2020, there were a total of 74 cases reported by the Ministry of Health and the Ethiopian Public Health Institute. However, as of March 23, 2020, there are no reported cases in Debre Berhan, which is the study area for this article.

## **Methods**

### **Study design, setting, and population**

A cross-sectional survey was conducted from March 18–24, 2020, with undergraduate DBU students. The university is located in Debre Berhan, which is 130 km from Addis Ababa and 682 km from Bahir Dar of the Amhara Regional State. Debre Berhan is 2850 m above sea level with the temperature ranging from 13–28 °C. According to the 2019 Registrar Office report, DBU has approximately 29,304 students pursuing regular and extension undergraduate and graduate studies. Of these more than 11,000 are regular undergraduate students. The University has two institutes, ten colleges, and 53 departments. Students that were present during the data collection period and were able to give responses were included in the study. Those who had mental or physical disabilities and could not fill out the questionnaires were excluded from the study. Because of our resource limitations, we restricted our sample size to 546.

### **Study variables**

In this study, the KAP towards COVID-19 was the outcome variable. Socio-demographics and the source of information regarding COVID-19 were considered the independent covariates.

### **Data collection tool and procedure**

A data collection tool was developed from previous studies [10, 14] and WHO course material on emerging respiratory viruses, including COVID-19 [15]. The questionnaire consisted of two parts: socio-demographics and KAP. Socio-demographic variables included age, sex, marital status, residence, year of study, average monthly income, and source of information. The second part of the survey assessed student knowledge about COVID-19, which included the symptoms of COVID-19-affected patients, transmission routes, precautions, and risk prevention. Participants were given three options per question: "Yes", "No", and "I don't know". Correct responses were given one point while incorrect responses or "I do not know" were given zero points. According to this study, "good knowledge" regarding COVID-19 means that the participant's score was above the mean score on knowledge questions. Conversely, "poor knowledge" was assigned to students who scored below the mean score on knowledge questions. In this

study, Cronbach's alpha coefficient for the knowledge questionnaire was 0.83, indicating acceptable internal consistency [16].

Attitudes towards COVID-19 were measured with four questions. These questions used a five-point Likert-type response scale: strongly agree (5 point), agree (4 point), neutral (3 point), disagree (2 point), and strongly disagree (1 point). Using previous studies, as a baseline we have categorized in to agree, neutral and disagree. Subscale scores were calculated for each participant. Higher scores indicated a "favorable" attitude about COVID-19. Participant practices were assessed by questions on five specific behaviors. Additional data were collected through self-administered which guided by six trained data collectors.

### **Data quality assurance**

A draft of the questionnaire was distributed to seven randomly selected faculty members to assess its readability and validity before pretesting for clarity, relevance, and acceptability. The questionnaire was initially developed in English and then translated to the local language (Amharic) by an expert and then back to English to ensure consistency. All data collectors were trained on how to properly collect data, how to maintain confidentiality, and how to ensure genuine replies to the questions. Furthermore, the principal investigator followed the data collection process on a daily basis to ensure the completeness of the questionnaires and to give further clarification to the questions when needed.

### **Data processing and analysis**

The collected data were checked for completeness, coded, entered into Epi Data VS 3.1, and then exported into STATA™ Version 14 software for analysis [17]. Descriptive statistics were used to describe the relationship between study participants and the relevant variables. Binary logistic regression analyses were used to identify factors associated with KAP. Variables with a p-value < 0.2 during bivariable analysis were used in our multivariable analyses to control for confounding effects. Factors were selected using a backward stepwise method. Adjusted odds ratios (AORs) and their 95% confidence intervals (CIs) were used to quantify the associations between variables and KAP. Variables with p-value ≤ 0.05 after multivariable analysis were considered significantly associated with the outcome variable.

### **Ethics consideration**

Ethical clearance for this study was obtained from the Institute of Medicine and College of Health Sciences, DBU. Participants also gave verbal informed consent prior to data collection. Confidentiality of the study participants' information was maintained throughout the study by making the participants' information anonymous.

## **Results**

### **Socio-demographic characteristics**

A total of 546 participants completed the questionnaire. The mean age of the participants was  $21.7 \pm 2.5$  (standard deviation (SD)) years old with a range of 18–27 years old. More than half (307 (57%)) of the students were males and nearly half (230 (42%)) of the students were in first year. The majority of study participants (512 (93.7%)) were single, and 330 (60.4%) of the participants lived in rural areas. Additionally, most of the study participants (402 (73.6%)) heard about COVID-19 from social media (Table 1).

Table 1. Socio-demographic characteristics of the study participants.

Variables	Frequency	Percent
<b>Sex</b>		
Female	239	43
Male	307	57
<b>Age group (years)</b>		
<20	115	21
20-24	394	72.1
≥25	38	6.9
<b>Marital status</b>		
Single	512	93.7
Married	25	4.5
Divorced	10	1.8
<b>Religion</b>		
Orthodox Christian	477	87.3
Muslim	42	7.6
Protestant	27	5.1
<b>Residence</b>		
Rural	330	60.4
Urban	216	39.6
<b>Year of study</b>		
First year	230	42
Second year	129	23.6
Third year	136	25
Fourth and fifth years	51	9.4
<b>Monthly pocket money/Ethiopian Birr</b>		
<200	167	30.5
200-400	226	41.5
≥401	153	28
<b>Source of information</b>		
News media	115	21
Social media	402	73.6
Official government websites	11	2
Friends and family	18	3.4

Note: Social media was either Facebook, Twitter, Whatsapp, YouTube, Instagram, or a telegram. News media includes TV, magazines, newspapers, and radio.

## Participants' knowledge regarding COVID-19

The mean COVID-19 knowledge score was  $9.6 \pm 1.8$  with a range of 0–13. The correct answer rates for the 13 questions on the COVID-19 knowledge questionnaire was 54.4–95%. Most of participants (403 (73.8%)) scored above the mean and were considered as having good knowledge about COVID-19. Among the 546 participants, 71.4% correctly responded that the main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and shortness of breath, and the majority (95%) said currently there is no cure for COVID-19 (Table 2).

Table 2. Participant knowledge towards COVID-19.

Variable	Yes		No	
	No	%	No	%
The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and shortness of breath	390	71.4	156	28.6
Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in people infected with the COVID-19.	398	72.8	148	27.2
Currently, there is no cure for COVID-19, but early symptomatic and supportive treatment can help most patients recover from the infection.	519	95	27	5
Not all people with COVID-19 will develop a severe form of the disease. Those who are elderly, have chronic illnesses, and are obese are more likely to be severe cases.	324	59.3	222	40.7
COVID-19 is transmitted through air, contact, and fecal-oral routes.	418	76.5	128	23.5
Eating or coming into contact with wild animals will lead to COVID-19 infection.	395	72.4	151	27.6
People with COVID-19 cannot infect others when a fever is not present.	249	45.6	297	54.4
The COVID-19 virus spreads via respiratory droplets from infected individuals.	350	64.1	196	35.9
Ordinary residents can wear general medical masks to prevent getting infected by the COVID-19 virus.	332	60.8	214	39.2
It is not necessary for children and young adults to take measures to prevent being infected by the COVID-19 virus.	227	41.5	319	58.5
To prevent being infected by COVID-19, individuals should avoid going to crowded places and taking public transportation.	430	78.7	116	21.3
Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus.	445	81.5	101	18.5
People who have been in contact with someone infected with COVID-19 should self-isolate. In general, the observation period is 14 days.	473	86.7	73	13.3

## Participants attitude towards COVID-19

Nearly half (229 (42%)) of the students indicated that they have no concern of being infected with COVID-19. Most of the respondents (447 (81.8%)) agreed that COVID-19 will be successfully controlled, and the majority (458 (83.8%)) believed that Ethiopia could win the battle against the COVID-19 virus. The attitudes of students towards COVID-19 are summarized in Table 3.

Table 3. Attitudes of the DBU students towards COVID-19.

Attitude questions	Agree	Disagree	Not sure
	N (%)	N (%)	N (%)
Do you agree that COVID-19 will be successfully controlled?	447 (81.8)	66 (12.2)	33 (6)
I have no concern of being infected with COVID-19.	229 (42)	303 (55.6)	14 (2.4)
Do you agree that washing hands with soap and water could help to prevent COVID-19 virus transmission?	415 (76)	87 (16)	44 (8)
Do you have confidence that Ethiopia can win the battle against the COVID-19 virus?	458 (83.8)	61 (11.2)	27 (5)

## Participants' practices in relation to COVID-19

The majority of the participants (91.4%) had not visited a crowded place in recent days and about 74% were washing their hands after sneezing and coughing. Nearly half (284 (52%)) of the participants report covering their mouth and nose with an elbow or tissue while coughing or sneezing. However, about 56% of people surveyed were not maintaining a social distance of at least one meter between themselves and anyone who was coughing or sneezing (Table 4).

Table 4. Practices of DBU students with respect to COVID-19

Questions	Yes		No	
	N	%	N	%
In recent days, have you gone to any crowded place?	47	8.6	499	91.4
Do you wash your hands after sneezing or coughing?	404	74	142	26
Do you touch your face, nose, or mouth with your unclean hands?	377	69	169	31
Do you cover your mouth and nose with an elbow or tissue while coughing or sneezing?	284	52	262	48
In recent days, have you maintained a social distance at least one meter (three feet) between yourself and anyone who is coughing or sneezing?	240	44	306	56

## Multivariate logistic regression

In our multivariable analyses, students who were 25 years old or older were 1.6 times more likely to be knowledgeable about COVID-19 than those <20 years old (AOR = 1.6, 95%CI: 1.2, 4.6). Similarly, participants who lived in urban areas were 4.3 times more knowledgeable about COVID-19 than those who resided in rural areas (AOR = 4.3, 95%CI: 2.6, 15.8). Lastly, participants who got their information on COVID-19 from the news media were 2.3 times more likely to have a favorable attitude towards COVID-19 as compared to those who received their information from friends and family (AOR = 2.3, 95%CI: 1.6, 8.7) (Table 5).

Table 5. Multivariate analyses of factors associated with knowledge and attitudes towards COVID-19 among students at DBU.

Variables	Knowledge		AOR	p-value	Attitude		AOR	p-value	
	Good	Poor			Favorable	Not			
Age	171 (71.5)	68 (28.5)	1.3 (0.5-3.8)	1	0.56	157 (65.7)	82 (34.3)	1.5 (0.6-2.7)	0.47
Gender	236 (76.8)	71 (23.2)				207 (68.5)	100 (31.5)	1	
Marital status									
Married	71 (61.8)	44 (38.2)	1			79 (68.6)	36 (31.4)	1	
Single	264 (67)	130 (33)	3.8 (0.6-23.3)		0.26	248 (63)	146 (37)	2.7 (0.6-13.4)	0.58
Divorced	28 (73.7)	10 (26.3)	1.6 (1.2-4.6)		0.04	27 (70.3)	11 (29.7)	1.4 (0.7-6.8)	0.39
Employment status									
Employed	336 (71.6)	176 (34.4)	2.3 (0.8-9.6)		0.54	297 (58)	215 (42)	1.2 (0.6-8.8)	0.27
Unemployed	16 (64)	9 (36)	1.2 (0.6-7.5)		0.38	14 (56)	11 (44)	1.7 (0.7-9.8)	0.49
Income									
Low	185 (56)	145 (44)	1			204 (62)	126 (38)	1	
High	188 (87)	28 (13)	4.3 (2.6-15.8)		0.01	164 (76)	52 (24)	1.7 (1.1-12.4)	0.04
Study									
1st year	129 (56)	101 (44)	1			145 (63)	85 (34)	1	
2nd year	79 (61)	50 (39)	1.9 (0.7-10.3)		0.71	74 (57)	55 (43)	2.6 (0.9-13.6)	
3rd year	80 (59)	56 (41)	1.5 (0.8-8.2)		0.54	90 (66)	46 (34)	1.7 (0.6-8.5)	0.63
4th and fifth	35 (68.6)	16 (31.4)	1.4 (1.1-12.5)		0.03	32 (62.7)	19 (37.3)	1.3 (0.5-8.5)	0.52
Others									0.31
Monthly pocket money									
Low	105 (63)	62 (37)				90 (54)	77 (46)		
High	172 (76)	54 (24)	1			138 (61)	88 (39)	1	
Very low	104 (68)	49 (32)	0.5 (0.2-5.6)		0.21	96 (62.8)	57 (37.2)	2.3 (0.8-11.2)	0.46
Very high			1.6 (0.7-10.3)		0.48			3.2 (0.7-14.6)	0.35

## of information

news media

social media

government	82 (71.3)	33 (28.7)	1.8 (1.2-9.2)	0.02	87 (75.6)	28 (24.4)	2.3 (1.6-8.7)	0.01
news sites	333 (83)	69 (17)	3.4 (1.9-13.7)	0.01	314 (78)	88 (22)	2.6 (2.1-11.8)	0.01
friends & family	7 (63.6)	4 (36.4)	0.6 (0.4-4.3)	0.26	8 (72.7)	3 (27.3)	1.3 (1.1-6.2)	0.03
	12 (66.7)	6 (33.3)	1		11 (61)	7 (39)	1	

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## Discussion

The KAP of a population can often determine the severity of an infectious disease outbreak. Indeed, KAP surveys have been used as important sources of data to design health interventions and public health policies. To the best of our knowledge, this is the first study in Ethiopia examining the KAP towards COVID-19 among university students or any other community for that matter. This epidemiological survey was conducted during the very early stages of the epidemic in Ethiopia and showed that about 73.8% of the study participants were knowledgeable about COVID-19. Additionally, about 71.4% responded correctly that the main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and shortness of breath. The vast majority (95%) of participants also said that currently there is no cure for COVID-19. We also found that more than 73.6% of the participants used social media as their main source of information about COVID-19.

In this study, the overall attitude of DBU students towards COVID-19 prevention was favorable in that they believed it would be controlled and could be prevented with good hygiene. Specifically, most of the participants (81.8%) believed that COVID-19 will eventually be controlled, and 83.8% had confidence that Ethiopia could win the battle against the virus. That said, we also found that most of the study participants had poor practices regarding COVID-19 prevention. We found that approximately 48% were not covering their mouth and nose with an elbow or tissue while coughing or sneezing, and 56% were not maintaining a social distance of at least one meter between themselves and anyone who is coughing or sneezing.

According to the present study, students who were 25 years old or older were 1.6 times more knowledgeable about COVID-19 as compared to those <20 years old. Additionally, we found that those living in urban areas were almost four times more knowledgeable about the virus as compared to those living in rural areas. Moreover, DBU students who heard most of their information from news media were 1.8 times more knowledgeable regarding COVID-19 as compared to those who heard information from friends and family. There was a significant positive correlation between year of study and COVID-19

knowledge scores. With respect to the attitude of DBU students regarding COVID-19, those who lived in an urban residence had a 1.7 times more favorable attitude towards COVID-19 prevention and control as compared with those living in rural areas. Moreover, participants who heard information about the disease from government websites had a 1.3 times more favorable attitude towards COVID-19 preventive measures as compared to those who heard information from friends and family.

Despite our extensive efforts in reducing the possible shortcomings of this survey, this study does have certain limitations. First, with such a small participant group, there is the question of the representativeness of the sample; hence, more studies are needed to investigate the KAP towards COVID-19 among other Ethiopian communities. In addition, the data presented in this study are self-reported, and thus may be subject to recall bias.

## **Conclusion And Recommendation**

This study showed that DBU students were moderately knowledgeable about COVID-19 and most participants had an optimistic attitude towards the control and prevention of the COVID-19 epidemic. However, most participants had poor practices with respect to containing the spread of the disease. Our study also found that urban residence, year of study, age greater than 25, and source of information about COVID-19 were significantly associated with the mean knowledge and attitude of the study participants. Importantly, nearly half of the study participants were not covering their mouth and nose with an elbow or tissue while coughing and sneezing. Moreover, more than half of the study subjects were not maintaining a physical distance at least one meter between themselves and anyone who was coughing or sneezing. Therefore, an increased effort must be made to improve the knowledge and practices of DBU students regarding COVID-19 prevention. This could be achieved through educational campaigns that target university students and the wider population.

## **Declarations**

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### **Available data and materials**

All materials are attached as supplementary materials, and all other information is included in the manuscript.

### **Authors' contributions**

YAA designed the study, developed the questionnaire, collected the data, analyzed the data, and prepared the manuscript. WSS designed the questionnaire, conducted the pilot test, and

conducted the literature review. All authors read and approved the final manuscript.

### Competing interest

The authors declare that they have no competing interests.

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### Consent for publication

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