



# Perceived Risk of COVID-19 and Related Factors Among University Students in Ethiopia During School Reopening

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**Background:** The novel coronavirus disease 2019 (COVID-19) has posed a great threat to the public. University students living in school compound with groups and sharing a common cafeteria are more susceptible to contract and spread the virus. Risk perception multiplies fear and anxiety that triggers precautionary action. However, research is scant in this particular field.

**Objective:** To assess the perceived risk of COVID-19 and its associated factors among University Students in Northeast Ethiopia during school reopening.

**Methods:** Institution-based cross-sectional study was conducted among 682 Debre Berhan University students from December 1–15, 2020, when students just get back to school. Data was collected using a structured and pre-tested questionnaire. A multistage sampling technique was used to select study subjects. Data were cleaned and entered into Epi-Data version 4.6 and exported to SPSS version 25 software for analysis. Descriptive statistics, bivariable and multivariable logistic regression analysis were run to summarize the results.

**Results:** The overall perceived risk of COVID-19 was 296 (43.4%), 95% CI (39.4–47.4). Age (AOR (CI) =3.27 (1.87–5.71), open relationship (AOR (CI) =3.17 (1.73–5.79), fathers' education (AOR (CI) =2.29 (1.31–4.02), having diabetes (AOR (CI) =2.64 (1.15–6.07), and information source from ministry of health (MOH) (AOR (CI) =1.87 (1.27–2.75) had significantly high-risk perception. However, students who use Facebook (AOR (CI) =0.57 (0.39–0.82) and Websites/articles (AOR (CI) =0.14 (0.06–0.34) had significantly low-risk perception. Television (59.8%) and Telegram (66.6%) were the primary sources of information, while the World Health Organization (68.3%) was the most trusted source of information.

**Conclusion:** University students perceived a low risk towards COVID-19 pandemics at the time of school resumption. It was influenced by students' demographic characteristics, comorbidities, social media, and information sources. The Ministry of Health and Ministry of Education should properly promote risk communication among university students.

**Keywords:** COVID-19, risk perception, factors, university students, Ethiopia

## Introduction

Coronavirus disease 2019 (COVID-19) is a highly infectious disease caused by the new coronavirus called SARS-CoV-2, which is a life-threatening respiratory pathogen.<sup>1</sup> The virus was first detected from cases in Wuhan, the People's Republic of China. It is believed to be a result of an animal to human transmission and has close genetic similarity to bat coronaviruses, suggesting it emerged from a bat-borne virus.<sup>2</sup> The most common symptoms of the virus are fever (above 38 °C), dry cough, and fatigue. The average incubation period is 5–6 days but can range

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from 1–14 days. The virus can infect peoples of all ages. However, older people aged 60 and over, and those with chronic diseases like asthma, hypertension, heart and lung problems, diabetes, obesity, or cancer, are at higher risk of developing severe illness.<sup>1</sup> The virus primarily spreads through respiratory droplets or secretions generated when an infected person coughs, sneezes, talks, or sings.<sup>3</sup>

As the number of deaths from the virus rises globally, it is crucial to understand the perceived risk of the infection. Risk perception is the people's subjective evaluation and/or judgment of hazards that they might be exposed to, regarding the severity, characteristics, and management. It is influenced by individual, social, cultural, and contextual factors, and they are based on experiences, beliefs, attitudes, judgments, misconceptions, and feelings.<sup>4</sup> Risk perception multiplies fear and anxiety and triggers precautionary action. People with high-risk perception tend to adopt protective health behavior and this reduces the possibility of infections.<sup>5,6</sup>

Currently, in Ethiopia, the higher education system has planned to reopen Colleges and Universities. However, there is no risk-free way to reopen. Without adequate prophylactic vaccines and effective treatment for cases, and with a highly contagious virus, bringing together students in traditional ways have a shocking consequence. Besides, communities had a low perceived risk of getting the virus. One study has suggested that only 23% of communities in Ethiopia had a high-risk perception towards COVID-19.<sup>7</sup> As of 22 February 2021, in Ethiopia, COVID-19 has caused 151,857 confirmed cases and 2,271 deaths.<sup>8</sup>

University students are one of the most dynamic groups with strong mobility and socialization. They are young, healthy, and often show mild symptoms after being infected, which can be contagious and easily spread from them to others. Besides, the outbreak of the COVID-19 infection coincides with the time of massive transportation during school re-entry and the Christmas holiday. Further, without adequate personal protective equipment, medical/health students posted inwards may have close contact with affected people and are supposed to be at risk of getting infected. One study in Ethiopia reported that only 31%, 27.4%, 15.9%, 14.5%, and 14.2% of health care providers had access to gloves, facemask, goggles, shoes, and apron respectively in hospitals.<sup>9</sup> To limit and terminate the spread of the virus, students should adhere to the control measures, which are largely affected by their risk

perceptions. So, attention needs to be given to the risk perception of university students.

To mitigate COVID-19 transmission while continuing the teaching-learning process, Debre Berhan University has set down prevention measures to be strictly adhered by the staff and the students. In-person classroom instruction shall not exceed 30 persons and should be limited to 40 minutes session. All students and staff should maintain 1 to 1.5 meters of physical distance in the library, laboratory, workshops, or other instructional settings while social distancing between the instructor and the students in the classroom should be 1.5 to 2 meters. Acceptable face shield covering both the mouth and nose should be worn at all times in public spaces, both in classrooms and outside classrooms. All students and staff are required to wash hands with soap and running water for at least 20 seconds or use hand sanitizer with 70%+ alcohol when entering and leaving classrooms, laboratories, workshops, or any other shared spaces. Staff and students with COVID-19 symptoms shall stay in their place of residence and report or seek medical attention. Classrooms shall be ventilated for at least 15 minutes after the end of each session. Besides, classrooms shall be cleaned and disinfected at least twice a day and a minimum of one hour of ventilation after disinfection. Further, offices, libraries, laboratories, and workshops shall be cleaned and ventilated regularly for at least an hour a day. Group activities such as team-based sports or games are prohibited.

Lack of adequate risk perception and preventive behavior among students can make them underestimate the situation, reduce fear and anxiety, and may interrupt the appropriate prevention measures. A basic study of university student's risk perception is necessary since COVID-19 continues to spread at an alarming rate. To the best of our knowledge, there is no study on university students' perceived risk of COVID-19 in Ethiopia. Therefore, this study aimed to determine the level of risk perception towards COVID-19 and its associated factors among Debre Berhan University Students, Northeast Ethiopia.

## Methods and Materials

### Study Setting, Design, and Period

An institution-based cross-sectional study was conducted among Debre Berhan University (DBU) students from December 1 to 15, 2020, when students just get back to school. Debre Berhan University is found at Debre Berhan town, which is the capital of the North-Shewa Zone

located about 130 km North-East of the capital city of Ethiopia. The university had fourteen colleges and 50 departments. By the year 2020/21, the university had a total number of 27,371 students: 17,397 male and 9,974 females. Of these, 11,573 are regular undergraduate and postgraduate students.

## Sample Size Determination

The sample size was computed using Open Epi version 3.03 statistical software. The following assumptions were considered: proportion 65%,<sup>10</sup> confidence level 95%, level of significance,  $\alpha=5\%$ , power of the study ( $1-\beta$ ), 80%, a margin of error,  $d = 5\%$ , and design effect,  $D = 2$ . By adding a 5% non-response rate, the final sample size was 713.

## Sampling Technique and Procedure

Study participants were selected from all regular students using a multistage sampling technique. Five colleges were selected using simple random sampling (SRS) and the calculated sample size was distributed to each of the selected colleges using the probability proportional to size (PPS) method. In each of the selected colleges' departments was selected using SRS. Then, in the selected departments, the required sample size was proportionally allocated based on the total number of students. Finally, from all students of the selected departments, SRS was done to pick the required sample size using a pre-determined sampling frame of all departments.

## Inclusion and Exclusion Criteria

Regular Debre Berhan university students of both sexes, and who agreed to participate in the study were included. Those who have a physical disability and not competent to fill the questionnaire were excluded.

## Data Collection Tool and Measurements

Properly designed, structured, and self-administered questionnaires were employed to collect data. The questionnaire was prepared based on previous, similar works of literature,<sup>11-13</sup> and was modified and validated to fit the local situation and the research objectives.

To determine the risk perception, twelve questions with three alternative options were applied. It was measured by two dimensions: perceived susceptibility and perceived severity dimension. Susceptibility was measured by asking the perceived risk/chance of acquiring the disease. Whereas perceived severity was assessed by asking about the likelihood

of managing daily activities if get infected, the chance of developing mild illness/symptoms, and the chance of feeling less anxiety and fear. One point was assigned for those who responded "Yes" and zero for ("Not sure") or ("No"). Higher values indicate higher risk perception. Based on the mean score of risk perception, students who scored above the mean were considered as High-risk and those who scored mean or below were considered Low-risk.<sup>11</sup> The Cronbach's alpha coefficients of the items were 0.74 and this demonstrated a satisfactory internal consistency.<sup>7</sup>

## Data Quality Control

A pre-test was conducted on 5% of the samples among Victory College students. The face and content validity of the questionnaire was checked by a reproductive health expert. Necessary amendments were made following the result of the pre-test and expert opinion. Two supervisors and four facilitators participated in the data collection. The questionnaire was first prepared in English and translated into the Amharic language then back-translated to English to check its consistency. One-day training was given for supervisors and facilitators regarding the purpose, methodologies, and data collection tools. The supervisors review and check the day-to-day activities of the facilitators regarding the completeness, clarity, and proper coding of the responses. Besides, there was continuous supervision to control the data collection procedure by the principal investigator.

## Data Management and Analysis

After checking the completeness and consistency of each questioner, the collected data were coded and entered into Epi-data software version 4.6 and then exported to SPSS version 25 statistical package for analysis. Descriptive statistics were done to quantify the risk perception and baseline characteristics of participants. Bivariable and multivariable logistic regression analysis were performed to identify the independent predictors of the outcome variable. Variables with a p-value of  $\leq 0.25$  in the bivariable logistic regression analysis were a candidate for the multivariable logistic regression analysis model. The strength of association was interpreted using an adjusted odds ratio (AOR) with a 95% confidence interval and the Hosmer-Lemeshow goodness-of-fit was applied to test for model fitness. The significance level was declared at a p-value of  $\leq 0.05$ .

## Ethical Consideration

Ethical clearance was obtained from the Institutional Review Board (IRB) of Debre Berhan University, College of Medicine, and Health Science (Ref. No: P0007/20). Besides, a formal support letter was written to selected colleges and/or departments to inform them about the study. After the data collectors explained the purpose, procedures, potential risks, and benefits of the study, informed consent was obtained from the study participants. The data was kept confidential and anonymous and was conducted following the declaration of Helsinki ethical principles.

## Results

### Characteristics of Participants

A total of 682 participants were involved in the study, making a 95.6% response rate. The age of participants ranged from 18–40 years with a mean age of  $23.35 \pm 3.46$  (SD) years. Of the total participants, 296 (43.4%) were females, 534 (78.3%) were single, and 570 (83.6) are undergraduate students (Table 1).

### Perceived Risk of COVID-19

About half of students (50.1%) think that their health was severely affected if they get infected with COVID-19. One-third (33.1%) of them will not go to the hospital even if they get sick with another disease because of the risk of COVID-19. Besides, 46.3% of students afraid to contact peoples who just returned from abroad. The overall high perceived risk of COVID-19 among students was found to be 43.4% (N=296), 95% CI (39.4–47.4), and the mean cumulative score of perceived risk was  $5.1 \pm 2.92$  (Table 2).

### History of COVID-19 and Chronic Disease

Regarding chronic illnesses, 4.7% of students had diabetes, and 5.9% had respiratory disease. About 27.3% of students had a history of COVID-19 infection, while 14.4% of them had families/friends tested positive for COVID-19 infection (Table 3).

### Use of Social Media and Trusted Sources of Information

Television (59.8%) and Telegram (66.6%) were the primary sources of COVID-19 information, whereas World Health Organization (68.3%) was the most trusted source of information among university students (Table 4).

## Factors Associated with the High Perceived Risk of COVID-19

In the multivariable logistic regression analysis model, factors including age, residence, faculty, marital status, parents' education, having diabetes, history of COVID-19 infection, family/friend history of death from the virus, use of social media (Facebook, Telegram, YouTube, Instagram ...) and trusted sources of information about COVID-19 (World Health Organization (WHO), Ministry of Health (MOH), Health care professionals) were included.

After controlling for confounders, age, marital status, father's education, having diabetes, use of social media, and information source from MOH were found to have a statistically significant association with perceived high-risk of COVID-19 infection.

High perceived risk of COVID-19 was three times more prevalent among students aged 26–35 years (AOR (CI) =3.27 (1.87–5.71) and those in an open relationship (AOR (CI) =3.17 (1.73–5.79), and two times more common among students whose fathers had attended primary school (AOR (CI) =2.29 (1.31–4.02), who had diabetes (AOR (CI) =2.64 (1.15–6.07) and who obtain information from MOH (AOR (CI) =1.87 (1.27–2.75). However, there is a less perceived risk of coronavirus infection among students who use Facebook (AOR (CI) =0.57 (0.39–0.82) and Websites/articles (AOR (CI) =0.14 (0.06–0.34) compared to their counterparts (Table 5).

## Discussion

In this study, the overall perceived high-risk of COVID-19 was 43.4%, 95% CI (39.4–47.4). Age, marital status, parent's education, having diabetes, use of social media, and national information source were significant associates of perceived high-risk of COVID-19.

The risk perception in this study was consistent with the previous findings reported in Iran (43.6%).<sup>14</sup> However, our result was lower than the study done in Southwest Ethiopia (53.4%),<sup>11</sup> Ghana (68.3%),<sup>15</sup> and Sierra Leone (75%).<sup>16</sup> Moreover, the study found a higher risk perception than 23.11% in Gondar,<sup>7</sup> and 7.6% in India.<sup>17</sup> This might be due to the differences in the study period, study population, data collection tool and procedures, and level of spread of the virus across countries and communities. Besides, it may account for the variations in socio-demographic backgrounds, access to information, level of knowledge, and risk communication of the local



**Table 1** Characteristics of Study Participants, 2020 (n=682)

Variables	Category	Frequency	Percent (%)
Age	18–25	561	82.3
	26–35	104	15.2
	≥ 36	17	2.5
Gender	Male	386	56.6
	Female	296	43.4
Residence	Rural	350	51.3
	Urban	332	48.7
Religion	Orthodox	540	79.2
	Muslim	56	8.2
	Protestant	74	10.8
	Others <sup>a</sup>	12	1.8
Marital status	Single	534	78.3
	In relationship	76	11.1
	Married	72	10.6
Faculty	Health <sup>b</sup>	442	64.8
	Non-health <sup>c</sup>	240	35.2
Level of education	Undergraduate	570	83.6
	Postgraduate	112	16.4
Mothers education	No formal education	360	52.8
	Primary school	112	16.4
	Secondary school	100	14.7
	Higher education	110	16.1
Fathers education	No formal education	304	44.6
	Primary school	112	16.4
	Secondary school	104	15.2
	Higher education	162	23.8
Number of students in the dorm	< 4	112	17.9
	≥ 4	560	82.1

**Notes:** <sup>a</sup>Catholic, 7th day Adventist, Hawariyat; <sup>b</sup>Medicine, nursing, midwifery, public health, and anesthesia; <sup>c</sup>Engineering, social sciences, computational sciences, and economics and business.

authorities. Risk perception plays a substantial role in disease transmission as healthy individuals are likely to avoid contact with vulnerable groups and sick people are likely to remain at home, which is beneficial for infection control.

**Table 2** Perceived Risk of COVID-19 Among DBU Students, 2020

Variables	Yes, N (%)	Not Sure, N (%)	No, N (%)
I think that I am at risk of getting COVID-19.	296 (43.4)	196 (28.7)	190 (27.9)
I am afraid to eat outside the home.	242 (35.5)	136 (19.9)	304 (44.6)
I worry that my family member might get COVID-19.	290 (42.5)	168 (24.7)	224 (32.8)
I think that my health will be severely affected if I get infected with COVID-19.	342 (50.1)	194 (28.5)	146 (21.4)
I feel disturbed when I think about coronavirus disease.	328 (48.1)	150 (22.0)	204 (29.9)
I avoid taking public transport.	194 (28.4)	140 (20.5)	348 (51.1)
I am afraid of eating raw foods.	320 (46.95)	146 (21.4)	216 (31.7)
I think that there is a stigma related to COVID-19.	267 (38.7)	196 (28.7)	222 (32.6)
I am afraid to contact peoples who just returned from abroad.	316 (46.3)	154 (22.6)	212 (31.1)
I will not go to the hospital even if I get sick with another disease because of the risk of getting infected with COVID-19.	226 (33.1)	102 (15.0)	354 (51.9)
I am afraid to contact people with flu symptoms (eg, cough, sneezing, runny nose, fever).	402 (58.9)	148 (21.7)	132 (19.4)
If I get infected with coronavirus, I cannot manage my daily activities.	256 (37.5)	130 (19.1)	296 (43.4)

Age was found to be a strong determinant factor for the high perceived risk of COVID-19. Students aged 26–35 years were three times more likely to have a high perceived risk compared to those who are younger. This finding was in line with reports from Gondar<sup>7</sup> and Southwest Ethiopia.<sup>11</sup> Besides, a study in China found that for every one-year increase of age, there is a 4.9% increased perceived risk of COVID-19.<sup>18</sup> Even if the virus infects peoples of all ages, the prevalence as well as the risk of death was higher among older people.<sup>1</sup> Besides, as age increases, there might be a high level of perceived susceptibility and perceived

**Table 3** History of COVID-19 and Chronic Diseases

Variables	Category	Frequency	Percent (%)
<b>Chronic diseases</b>			
	Diabetes	Yes No	32 650
Hypertension	Yes No	30 652	4.4 95.6
	Kidney disease	Yes No	26 656
Heart disease	Yes No	40 642	5.9 94.1
	Respiratory disease	Yes No	40 642
HIV/AIDS	Yes No	24 658	3.5 96.5
	History COVID-19 infection	Yes No	186 496
Friends/families tested positive for COVID-19 infection	Yes No	98 584	14.4 85.6
	Friends/families died from COVID-19 infection	Yes No	42 640

severity of disease with increased risk perception and the likelihood of adopting prevention measures.

Our result also established a statistically significant association between the educational status of the father and the perceived risk of COVID-19. Students whose fathers had attended primary school were more likely to have a high-risk perception compared to those whose fathers had no formal education (AOR (CI) =2.29 (1.31–4.02). Similarly, another study in Ethiopia established a comparable result.<sup>19</sup> This might be due to the parents' better educational background might have helped in the rational understanding of the pandemics, which might, in turn, influenced a child's risk perception and precaution measures. Besides, these groups of people may have a better willingness and access to information from various sources. Moreover, low educated people had low knowledge and poor practice of prevention behaviors.<sup>14</sup>

Risk perception was higher among students in an open relationship compared to those who are single. Similarly, another study in Ethiopia reported higher perceived susceptibility among married respondents.<sup>19</sup> Also, a study by<sup>18</sup> found that having a marriage/history of marriage

**Table 4** Use of Social Media and Trusted Sources of Information, 2020

Variables	Category	
	Yes, Number (%)	No, Number (%)
<b>Use of social media</b>		
Facebook	376 (55.1%)	306 (44.9%)
Telegram	454 (66.6%)	228 (33.4%)
You tube	152 (22.3%)	530 (77.7%)
WhatsApp	50 (7.3%)	623 (92.7%)
Instagram	86 (12.6%)	596 (87.4%)
Scientific websites and articles	84 (12.3%)	598 (87.7%)
TV/Radio	408 (59.8%)	274 (40.2%)
Magazines and newspaper	78 (11.4%)	604 (88.6%)
<b>Trusted sources of information</b>		
WHO	466 (68.3%)	216 (31.7%)
MOH	364 (53.4%)	318 (46.6%)
Health care professionals	150 (22.0%)	532 (78.0%)

**Abbreviations:** WHO, World Health Organization; MOH, Ministry of Health.

was significantly related to a high perceived risk level. The possible reason may be that married individuals might have many family members with various exposure statuses, and just they may feel that one of the family members may acquire and spread to others. In other ways, in an open relationship, one or both partners can engage in romantic or sexual activities outside the relationship, which can increase the risk of contracting the virus.

This study confirmed that having diabetes mellitus (DM) increases the perceived risk of COVID-19. The risk was double among diabetic students. A similar result was obtained from Chongqing, China, where individuals with chronic diseases had a higher level of risk perception.<sup>17</sup> Besides, a systematic review, and meta-analysis found that diabetes and hypertension were the two more prevalent co-morbidities among COVID-19 patients.<sup>20</sup> The possible explanation might be due to people with pre-existing medical problems like diabetes, asthma, hypertension, heart and lung problems, are prone to infection and progressed to severe illnesses and complications, and hence more perceived risk of infection.<sup>1</sup>

Students who used social media had a low perceived risk of COVID-2019. A consistent result was reported from Chongqing, China, in which individuals who use WeChat contacts as the main information source perceived a lower risk of infection (OR =0.196).<sup>18</sup> This could be due

**Table 5** Factors Associated with Perceived Risk of COVID-19 Among DBU Students, 2020

Variables	Categories	Risk Perception		COR (95% CI)	AOR (95% CI)
		Low-Risk	High-Risk		
Age	18–25 years	326	235		
	26–35 years	50	54	1.49(0.99–2.28)	3.27(1.87–5.71)**
	≥ 36 years	10	7	0.97(0.36–2.59)	2.41(0.68–8.56)
Residence	Rural	182	168	1.47(1.09–1.20)	1.14(0.77–1.68)
	Urban	204	128		
Marital Status	Single	306	228		
	In open relationship	34	42	1.67(1.02–2.69)	3.17(1.73–5.79)**
	Married	46	26	0.76(0.46–1.26)	0.56(0.29–1.09)
Faculty	Health/Medical	242	200	1.24(0.90–1.71)	1.03(0.69–1.52)
	Non-health/medical	114	96		
Fathers Education	No formal education	164	140		
	Primary school	50	62	1.45(0.94–2.25)	2.29(1.31–4.02)**
	Secondary school	72	32	0.52(0.32–0.84)	0.97(0.51–1.84)
	Higher education	100	62	0.73(0.49–1.07)	1.59(0.86–2.96)
History of Covid-19	Yes	90	96	1.58(1.13–2.22)	1.17(0.77–1.79)
	No	296	200		
Friend/family history of death	Yes	20	22	1.47(0.79–2.75)	1.37(0.59–3.21)
	No	366	274		
Having diabetes	Yes	14	18	1.72(0.84–3.52)	2.64(1.15–6.07) *
	No	312	278		
Facebook use	Yes	238	138	0.54(0.40–0.74)	0.57(0.39–0.82)**
	No	148	158		
Telegram use	Yes	268	186	0.75(0.54–1.03)	0.88(0.6–1.30)
	No	118	110		
TV/Radio	Yes	244	164	0.72(0.53–0.99)	0.82(0.56–1.18)
	No	142	132		
Magazines/Newspaper	Yes	60	18	0.35(0.20–0.61)	0.48(0.23–1.00)
	No	326	278		
Websites/Articles	Yes	76	8	0.11(0.05–0.24)	0.14(0.06–0.34)**
	No	310	288		
WHO	Yes	276	190	0.71(0.52–0.99)	1.39(0.91–2.13)
	No	110	106		
MOH	Yes	192	172	1.40(1.03–1.90)	1.87(1.27–2.75)**
	No	194	124		

**Notes:** \*Statistically significant at  $P < 0.05$ ; \*\*statistically significant at  $P < 0.01$ .

**Abbreviations:** WHO, World Health Organization; MO, Ministry of Health.

to the students who use social media may get important information and have a better understanding to apply the prevention measures, so that they may have a lower perceived risk of infection. A study in Sierra Leon found that social media was strongly associated with increased

knowledge and avoiding crowds.<sup>16</sup> This was represented in several studies<sup>21,22</sup> that stated those with good knowledge are more likely to adopt precaution measures.

Information source from the national ministry of health was also associated with increased risk perception towards

COVID-19. This could be related to the frequent access to information that might have led to good knowledge. The National Health Commission regularly disseminates health counseling, prevention behaviors, the number of screened populations, new cases, and deaths, to ensure the citizen's safety. In Ambo, Ethiopia, daily access to information reduces the level of poor knowledge by 54.4%.<sup>22</sup> In other ways, students with higher knowledge levels have a higher risk perception of COVID-19.<sup>23</sup>

To mitigate COVID-19 transmission, Debre Berhan University has established general rules and regulations. In-person classroom instruction shall not exceed 30 persons and should be limited to 40 minutes session. All students and staff should maintain physical distance in the classroom, library, laboratory, workshops, or other instructional settings. Face masks covering both the mouth and nose should be worn at all times in public spaces. All students and staff are required to frequently wash hands with soap and water or use hand sanitizer. Staff and students with COVID-19 symptoms shall stay in their place of residence and report or seek medical attention. Classrooms shall be ventilated for at least 15 minutes after the end of each session. Besides, classrooms shall be cleaned and disinfected at least twice a day and a minimum of one hour of ventilation after disinfection. Further, group activities such as team-based sports or games are prohibited. This was in accordance with the WHO infection prevention and control guidance of COVID-19.<sup>1</sup> Besides, a similar preparedness plan was established at the University of Minnesota<sup>24</sup> and Saudi Arabia.<sup>25</sup>

## Limitation

The findings of this study should be interpreted with the following limitations. First, data were collected using a self-administered questionnaire, which may add social desirability bias. Second, the nature of self-perceived reporting may have resulted in the under/over-reporting of variables. Finally, the cross-sectional nature does not allow to make a causal relationship.

## Conclusion and Recommendation

University students perceived a low risk towards COVID-19 pandemics at the time of school resumption. It was influenced by students' demographic characteristics, comorbidities, social media, and sources of information. Television and Telegram were the primary sources of information, while the World Health Organization, (WHO) was the most trusted source of information.

The ministry of health should properly promote and monitor risk communication among university students. It may help guide how students should prepare for and respond to the COVID-19 pandemics, and helpful in the information disclosure, designing interventional activities, and policy formulation targeted at improving student's risk perception. Besides, it can be used as baseline data for future large-scale studies. Further, similar studies with various study designs and measurements should be conducted in different settings for more representative findings.

## Abbreviations

AOR, Adjusted Odds Ratio; CI, Confidence Interval; COR, Cruds Odds Ratio; COVID-19, Coronavirus Disease 2019; DBU, Debre Berhan University; MOH, Ministry of Health; SPSS, Statistical Packages for Social Sciences; SRS, Simple Random Sampling; WHO, World Health Organization.

## Data Sharing Statement

The datasets are available from the corresponding author and can be presented upon a reasonable request.

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## Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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The authors report no conflicts of interest in this work.



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