

# Knowledge Attitude and Practice of Higher Education Students Toward Prevention Of COVID-19 And Associated Factors as Recommended by WHO in Ethiopia

Jibril Dori<sup>1\*</sup>, Tadesse Tolossa<sup>2</sup>, Getu Mosisa<sup>1</sup>, Adugna Oluma<sup>1</sup>, Hunduma Gelalcha<sup>3</sup>, Girma yadesa<sup>3</sup>, Jote Markos<sup>1</sup>, Jibri Raba<sup>4</sup>, Amana Jilo<sup>5</sup>, Belete Negesa<sup>6</sup>, Lami bayisa<sup>1</sup> and Bizuneh Wakuma<sup>7</sup>

<sup>1</sup>School of Nursing and Midwifery, College of Health Sciences, Wollega University

<sup>2</sup>Department of Public Health, Institutes of Health Sciences, Wollega University, Nekemte, Ethiopia

<sup>3</sup>Departments of ophthalmic nursing Institutes of Health Sciences, Wollega University, Nekemte, Ethiopia

<sup>4</sup>Departments of Nursing College of Health Sciences, Diredawa University, Diredawa Ethiopia

<sup>4</sup>Departments of Nursing College of Health Sciences, Dembidolo university, Dembidolo Ethiopia

<sup>5</sup>Departments of Nursing College of Health Sciences, Bule Hora university, Bule hora

Ethiopia

<sup>6</sup>Departments of Nursing College of Health Sciences, Debra Birhan university,

Ethiopia

<sup>7</sup>Department of Pediatric nursing, Institutes of Health Sciences, Wollega University, Nekemte, Ethiopia

**\*Corresponding author:** Jibril Dori, School of Nursing and Midwifery, Institutes of Health Sciences, Wollega University, Nekemte, Ethiopia, Tel: 251982725422, E-mail: diribamulisa@gmail.com

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## Abstract

**Backgrounds:** Currently, COVID 19 is one of the most common issues that bring great challenge to our world. To stop the effect of this disease many activities regarding prevention and treatment have being conducted as world. Even though this world's nations give great concern in prevention of COVID-19 there is no adequate achievement. In Ethiopia, there is no finding regarding to KAP of higher education students toward prevention of covid-19 and associated factors as recommended by WHO. Therefore, in this study KAP of higher education students toward prevention of covid-19 and associated factors as recommended by WHO was assessed

**Methods:** Short online analytical cross-sectional survey was conducted in higher education students in Ethiopian University from June, 2020 to August, 2020. The online survey's response was collected by creating the campaign that represents the individual included university. For this campaign all involved university have their own instructor to links the address on their page or invite their students. Those involved universities instructors were post those links on their corresponding pages as face book and email. Descriptive statistic as mean or media and percentages was computed. On line collected data were interred into EpiData and exported to Stata /SE version 14 for analysis. From binary logistic regression variables with p value  $\leq 0.25$  were candidate for multiple logistic regression. Variable in the final model was selected by step-wise backward selection procedure. Model of goodness of fit was done by log likelihood goodness of fit test. COR and AOR with 95% confidence intervals was computed and statistical significance variables was considered with P-value  $< 0.05$ . Then finally, Variables with a p-value  $\leq 0.05$  was considered as statistically significant.

**Results:** In this study 384 students have been participated. Greater than half of those students were male 232 (60.42%). Social sciences students are more unknowledgeable about Covid-19 AOR=1.04(5% CI 0.62, 1.74), those who are unknowledgeable about Covid-19 have poor attitude toward covid-19, AOR=6.47 (95%CI 4.06, 10.33).

**Conclusion:** and recommendation: KAP of the students is affected by residence, age and Fields of study. For those identified condition required interventions have to implemented by concerned stake holders

**Keywords:** COVID-19; SARS-CoV-2; Students; Ethiopia

**List of Abbreviations:** SARS: Severe Acute Respiratory Distress; KAP: Knowledge Attitude and Practice

## Introduction

Coronavirus disease (COVID-19) is potentially lethal disease, which is of great concern for global public health because it is a new disease that is different from other virus like SARS, MERS and influenza [1,2]. It has made tremendous crisis around the globe, affecting people's lives and causing a large number of mortalities [3]. On 30 January 2020, WHO announced that the COVID-19 outbreak was a Public Health Emergency of International Concern and on 11 March WHO described the COVID-19 situation as a pandemic [2,4]. A lot of peoples have been infected with this virus and around 3-4 percent of them have died and leads the WHO to give great attention [5].

Worldwide the outbreak of COVID-19 continues, to be pandemic had its first wave between December and January 2020 in Asia, and then goes through to Europe and America, recording its second wave from February until date. There is great fear in Africa even if the numbers of cases are low. The third wave of the pandemic may increase in the global spread [6]. There are variety of perception regarding source of emergence of COVID-19, transmission and control ability of countries [7].

Even though there is some action currently employed, in Africa the disease is widely spread and infested so many peoples [8].

Since its occurrence, COVID-19 is rapidly and extensively spreading which is primary concern for the health care professionals and health care system [9]. Emerging infectious diseases continue to infect and reduce human populations at different time. The Globe has experienced several epidemics posing serious threat to global public health of which the current corona virus disease (COVID-19) pandemic with more than 6 million cases on May 30, 2020 [6]. Currently in August 12/2020 in Ethiopia there is 24,175 case with 44° death and 10,696 recovery [10].

Since the appeared of this disease the education system has been disturbed and many different countries take their own measure as Online learning platform, Instructions on a website, Emails sent to the class/parents, Physical workbooks/sheets, Online video clips to watch, online 'live' video conferencing and on line chatting [11,12]. International Institute of higher education reports that COVID-19 has great impacts on university students in in many directions as stake holders, institution it-self and students [13]. The study showed that many students experienced un-wanted out come as depression, isolation from friends and others accept is as it is easy regarding to hearing this COVID-19 [12,14].

Developed country tried to identify area of weakness regarding to COVID-19 prevention and give direction for their future education progress [13]. But this is not well addressed in case of developing countries as Ethiopia. In those developing countries no adequate studies is there regarding to COVID-19. The aim of this study is to identify knowledge, attitude and practice of higher education students toward prevention of COVID-19 as recommended by world health organization. It aimed at identify status of students and give recommendation for what have to do in the direction of the students to make the students continue their education in the future.

It is known that currently COVID 19 is one of the most common issues that our world is suffering from. To stop the effect of this disease many activities regarding to prevention, treatment and rehabilitation have being conducted as a world and our country Ethiopia too. In the world as a whole more concern is given in the direction of prevention. The only recommendation that WHO accepted as is appropriate till today is to act on its prevention [8].

This is the first research to be conducted on higher education students in Ethiopia. Since it is from all university in Ethiopia it includes relative equal assessment in the Ethiopia.

Regarding this prevention and treatment issue it is better to identify area of weakness in our society (Ethiopia). It will also uses as a base line for concerned body to develop appropriate strategies to prevent SARS CoV-2 infection. Currently those students are with their parents and the survey was indirectly showed us what the community looks like indirectly. In other way it gives as a direction for the coming class opening of 2020/2021 in our country. It gives the direction for the university regarding to this SARS-CoV-2 infection among the students.

Since the international attention is to focus on prevention purpose it is must to encourage weakness regarding to KAP. Since this research is the first in Ethiopia, it will give some issue regarding to the students KAP. This general problem of the community will also affect the knowledge attitude and practice of the students as parts of the community .15 Therefore, KAP of students regarding COVID-19 Prevention and associated factors have identified by this research. The research finding indicated that the students of higher education need psychological interventions during Covid-19, because they experienced anxiety and depression symptom [16].

## Method

Analytical study design was conducted on higher education students in Ethiopia from June to August. In this study four university's student as Wollega University, Diredawa University, Dambidolo university and Debre Birhan University have been participated. Those selected university is from four different regions in Ethiopia. In this case all higher government students in Ethiopia have been considered as source population. Study population was students in those selected universities with study unit were those students who have accessed the link and respond the questions. Those students outside the Ethiopia during study period were not included in the study. Those links

that represent corresponding universities are: - For Wollega University “[https://www.allcounted.com/s?did=w21bo69ftbdjv&lang=en\\_US](https://www.allcounted.com/s?did=w21bo69ftbdjv&lang=en_US)”, For Bule hora university University “[https://www.allcounted.com/s?did=cahm80io6mlxf&lang=en\\_US](https://www.allcounted.com/s?did=cahm80io6mlxf&lang=en_US)”, Dambidolo university “[https://www.allcounted.com/s?did=cflmv69xnm8d7&lang=en\\_US](https://www.allcounted.com/s?did=cflmv69xnm8d7&lang=en_US)” For Debra Birhan University [https://www.allcounted.com/s?did=kxnmj6frumxnf&lang=en\\_US](https://www.allcounted.com/s?did=kxnmj6frumxnf&lang=en_US). Those links were sent to corresponding university instructor in evolved in this research and each instructor forms his own campaign to get the required number of the students. The survey has been commenced in May 1 20/20 and end in July 25 2020 when the sample size have completed.

## Sample size determination

Sample size of the study was determined by using single population proportion formula by considering p (50%) with the allowed margin of error 5% and 95% level of confidence as the following formula.

$$n = \frac{Z_{\alpha/2}^2 p (1-p)}{d^2}$$

Where

n= Sample size

Z<sub>α/2</sub> = Z<sub>α/2</sub> value corresponding to a 95% level of confidence =1.96

P=expected outcome of twins pregnancy=50% =0.5

d= absolute precession 5%

n= (1.96)<sup>2</sup> (0.5)(0.5) / (0.05)<sup>2</sup> = 384

## Sampling technique and Data Collection Procedures

Fist all counted online survey was created and the question was developed. For this online survey the questionnaire was accepted from previously conducted research (17). In this the study there was four category of question as seven socio-demographic questions, twelve Knowledge questions( each answered as 1= yes,2=no, 3= I don't know ) eight Attitude question (Each answered as agree=1,disagree=2,eitheragree/disagree=3) and eleven practices questions were used and each were answered as (1=yes, 2=no). For all knowledge attitudes and practice mean value was calculated. Value less than mean were considered as Unknowledgeable, poor attitude and poor practice for dependent variables of knowledge, attitude and practice . First the question was evaluated by one public health provider and one university instructors. Then the pretest was conducted on thirty five students from other university. For this pretest Cronbach's alpha was computed and gives the result of 0.089. For all four involved universities their own links were created. For all four participated university four instructors have been selected and quota was given for them. From one university 96 students were accepted. Those students were selected from all involved university by the campaign created by corresponding university instructors. From every involved university at the time of the quota is filled data collection was stopped. The data will be obtained by online self-administered questionnaire distributed to specific Facebook groups according to the created campaign by all involved government university students. The recent day means any events regarding to the most recent during complete this survey.

## Data Analysis

Short online analytical cross-sectional survey was conducted in higher education students in Ethiopian University from June, 2020 to August, 2020. The online survey's response was collected by creating the campaign that represents the individual included university. For this campaign all involved university have their own instructor to links the address on their page or invite their students. Those involved universities instructors were post those links on their corresponding pages as face book and email. Descriptive statistic as mean or media and percentages was computed. On line collected data were interred into EpiData and exported to Stata /SE version 14 for analysis.

For dependent variables as knowledge, attitude and practice first their mean of score have been calculated. Then the value below the mean is recoded as one (1) and value above the mean is recoded as zero (0). This recoding was performed separately for knowlage, attitude and practice based on their own mean value. Then those recoded and generated variables were used as dependent variables.

From binary logistic regression variables with p value ≤ 0.25 were candidate for multiple logistic regression. Variable in the final model was selected by step-wise backward selection procedure. Model of goodness of fit was done by log likelihood goodness of fit test. COR and AOR with 95% confidence intervals was computed and statistical significance variables was considered with P-value <0.05. Then finally, Variables with a p-value ≤ 0.05 was considered as statistically significant.

## Ethical Clearance

The Ethical clearance letter was obtained from ethical review committee of Wollega University. The letter was send to every involved university with correspondence link. Any information obtained has been kept strictly confidential and was not exposed to any others. On the introduction parts of survey question the participants have informed that participation is volunteer based. There was no means for identify the individual participated on the study. Consent for participation was obtained by being included in the campaign created by correspondent participated university instructors. Those who were no wish to participate were removed from the created campaign

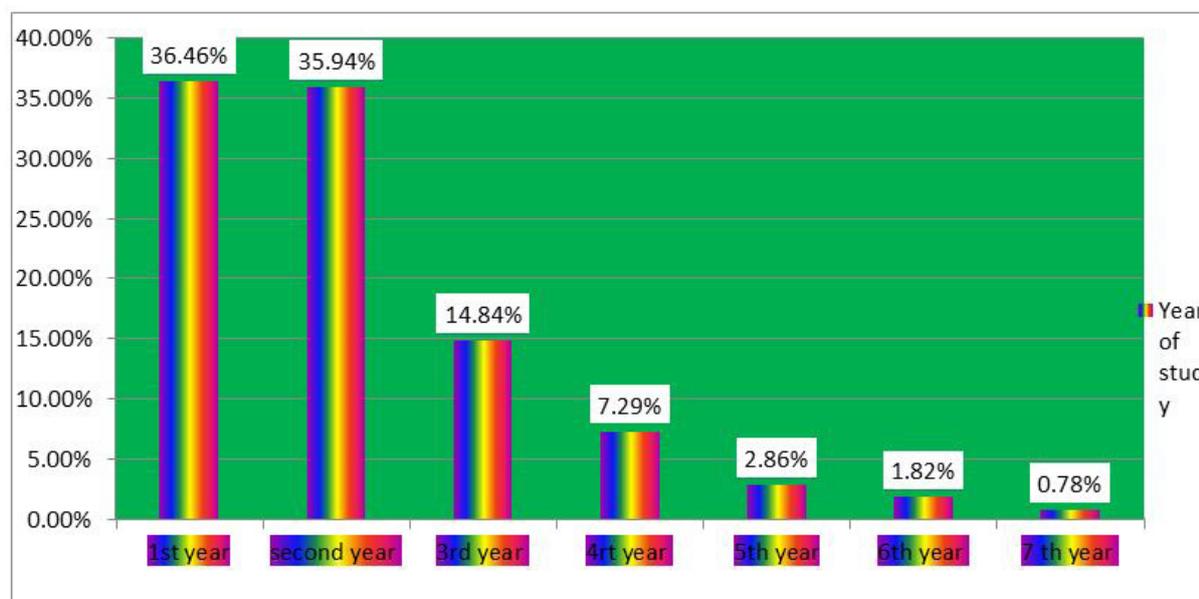
## Results

In this study 384 respondents were participated and give response rate of 100%. Regarding to age of the students the mean was 23 (SD 21, 25). Greater than half of those students were male 232 (60.42%). concerning to marital status most of them were single 312 (81.25%). Greater than half of them were from rural area 207 (53.91%). Again in this study around three fourth of them are natural students based on preparatory categorization 289 (75.26%). In the current academic year most of the students are learning their first degree 351 (91.41%) Table 1.

Variables	Option	Frequency (%)	Percent
Age	1. ≤ 23 years	238	61.98
	2. >23 years	146	38.02
Sex	1. Male	232	60.42
	2. female	152	39.58
Marital status	1. single	312	81.25
	2. married	71	18.49
	3. others	1	0.26
Residences	1. Urban	177	46.09
	2. Rural	207	53.91
Field of study based on preparatory categorization	1. Natural sciences	289	75.26
	2. Social sciences	95	24.74

**Table 1:** Socio-demographic factors of selected higher university students in Ethiopia, 2020

Regarding to academic year of 2019/2020 most proportion of the students were learning first year 140 (36.46%) and second year 138 (35.94%) Figure 1.



**Figure 1:** Year of study based on academic year of 2019/2020 of selected higher university students in Ethiopia/2020

## Knowledge of the students regarding to COVID-19

In this study greater than three fourths of the students know that the main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and myalgia 345 (89.84%). Greater than half of the students know that common cold, stuffy nose, runny nose, and sneezing are more common in persons infected with the COVID-19 virus 314 (81.77%). Regarding to managements of this diseases most of them know that currently there is no curative treatment for COVID-19 diseases but, early intervention can recover the patients

from infection 223 (58.07%). Regarding to severity of the diseases around quarter of the students know as there is no different severity among different age category of the peoples 111 (28.91%). Greater than half of the students know that this disease can be transmitted to human beings by either contact or eating of their products if they are contaminated 260 (67.71%). Regarding to one ways of transmission of this diseases almost all of the students know that as it can be transmitted by droplet 372 (96.88%). Again quarter of the students do not know as early isolation of infected person is good 110 (28.65%) Table 2

Variables	Option	Frequency (%)	Male	female	chi2	df	P
The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and myalgia	yes	345(89.84)	213	132	2.484	2	0.115
	No	39 (10.16 )	19	20			
Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus.	Yes	66 (17.19)	33	33	10.24	2	0.006
	No	314(81.77 )	199	115			
	Idon't know	4 (1.04)	0	4			
Currently no effective cure for COVID-2019, but early symptomatic and supportive treatment can help most patients recover from the infection	yes	223 (58.07)	144	79	6.614	2	0.037
	No	140 (36.46)	80	60			
	Idon't know	21 (5.47)	8	13			
Not all persons with COVID-2019 will develop to severe cases. Only those who are elderly, have chronic illnesses, and are obese are more likely to be severe cases	yes	257 (66.93)	156	101	3.847	2	0.146
	No	111 (28.91)	70	41			
	Idon't know	16 (4.17)	6	10			
Eating or contacting wild animals would result in the infection by the COVID-19 virus	yes	260(67.71 )	168	92	7.982	2	0.018
	.no	105 (27.34)	57	48			
	Idon't know	19 (4.95 )	7	12			
Persons with COVID-2019 cannot infect the virus to others when a fever is not present	yes	61(15.89)	34	61	0.663	2	0.415
	No	323(84.11 )	198	323			
The COVID-19 virus spreads via respiratory droplets of infected individuals	yes	372(96.88 )	228	144	3.799	2	0.051
	No	12 (3.13 )	4	8			
Ordinary residents can wear general medical masks to prevent the infection by the COVID-19 virus	yes	247 (64.32)	153	94	0.855	2	0.652
	No	120 (31.25)	70	50			
	Idon't know	17 ( 4.43 )	9	8			
It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus.	yes	3 (0.78 )	1	2	0.927	2	0.336
	No	381 (99.22)	231	150			
To prevent the infection by COVID-19, individuals should avoid going to crowded places such as train stations and avoid taking public transportations	yes	368 (95.83 )	224	144	1.872	2	0.392
	No	15 ( 3.91)	8	7			
	I don't know	1 (0.26 )	0	1			
People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. In general, the observation period is 14 days	yes	258 ( 67.19 )	156	102	3.990	2	0.136
	No	110 (28.65 )	70	40			
	I don't know	16 (4.17 )	6	10			

Table 2: Knowledge of the students regarding to COVID-19 prevention with gender difference, 2020

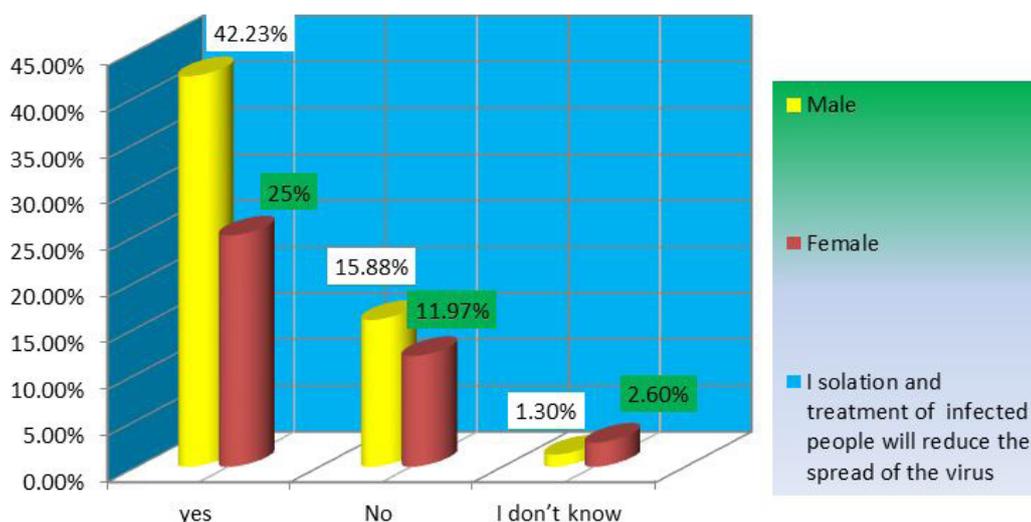


Figure 2: gender difference knowledge of the students regarding to isolation

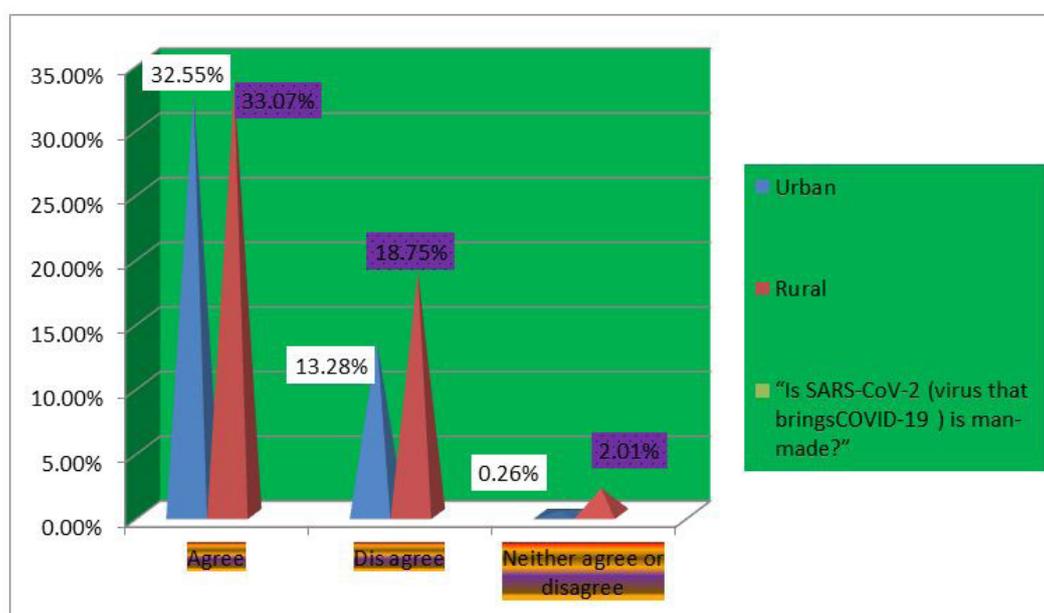
This research also showed that knowledge of the students was different among gender. Regarding to the question “Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus” more proportion of the male students were agreed that 42.23% and 25% male and female respectively Figure 2.

### Attitude of the students regarding to COVID-19

The finding from this study showed that almost half of the students disagree that this disease can be successfully controlled 193 (50.26 %). Again in this research greater than half of the students agree that SARS-CoV-2 is man –made virus 252 (65.63%). The finding also showed that more percent of the students are considered the diseases as it is very dangerous 251 (65.36%). Some students worry that their family will be infected with this virus 249 (64.84%). More proportion of the students are afraid to going to common place expose is expose the person to this diseases 241 (62.76%) Table 3

Variables	Option	Frequency (%)	Urban	Rural	chi2	df	P
Do you agree that COVID-19 will finally be successfully controlled?	Agree	180 (46.88)	102	78	18.82	2	0.000
	Dis agree	193(50.26)	74	119			
	Neither of agree/disagree	11 (2.86)	1	10			
Do you have confidence that Ethiopia can win the battle against the COVID-19 virus?	Agree	134 (34.90)	62	72	1.469	2	0.480
	Dis agree	242 (63.02)	113	129			
	Neither of agree/disagree	8 (2.08)	2	6			
Do you think that the disease is dangerous?	Agree	251 (65.36)	118	133	2.828	2	0.243
	Dis agree	123 (32.03 )	57	66			
	Neither of agree/disagree	10 (2.60)	2	8			
Are you worried about one of your family members can get infection?	Agree	249 (64.84)	122	127	4.48	2	0.106
	Dis agree	128 (33.33)	54	74			
	Neither of agree/disagree	7 ( 1.82 )	1	6			
Are you afraid to go to common places in order to avoid infection?	Agree	241 (62.76 )	119	122	3.010	2	0.222
	Dis agree	134 (34.90)	55	79			
	Neither of agree/disagree	9 ( 2.34 )	3	6			
Is the available information about MERS-CoV2 is sufficient in Ethiopia?	Agree	248 (64.58 )	126	122	6.344	2	0.042
	Dis agree	129 (33.59)	48	81			
	Neither of agree/disagree	7( 1.82)	3	4			
Are the protective measures in Ethiopia sufficient for prevention?	Agree	254 ( 66.15)	124	130	2.685	2	0.261
	Dis agree	123( 32.03 )	51	72			
	Neither of agree/disagree	7 ( 1.82 )	2	5			

**Table 3:** Attitude of the students regarding to COVID-19 prevention with residence difference in selected hospitals in Ethiopia, 2020



**Figure 3:** Residence based difference among attitude of the students regarding to how SARS-COV-2 is formed

There is residence based difference regarding to attitude of COVID-19. For attitude question of “Is SARS-CoV-2 (virus that brings COVID-19) is man-made?” there is no more difference response based on being urban residence students and rural residence students. Both categories agreed that this SARS-CoV-2 is man-made 32.55% urban students versus 33.07% rural students (Figure 3).

### Practice of the students regarding to COVID-19 prevention

Regarding to any activity related to this disease the finding showed that around seventy percent of the students have gone to crowded place in the recent days 256 (66.67%). In the recent days of complete this survey greater than thirty percent of the students didn't use face mask during going outside 142 (36.98%). Three fourth of the students were not at the state of staying at home during this data collection 281 (73.18%). Greater than half of the students have sanitizer in their home during conducting this survey 253 (65.89%) and greater than three fourth of them have no history of shaking some bodies hand during complete this survey 326 (84.90%) Table 4

Variables	Option	Frequency (%)	Natural	Social	chi2	df	P
In recent days, have you gone to any crowded place?	Yes	256 (66.67)	199	57	2.524	2	0.112
	No	128 (33.33)	90	38			
Are you frequently washing your hands with soap and water for at least 20 seconds. When soap and running water are unavailable, use an alcohol-based hand rub with at least 80% alcohol?	Yes	167 (43.49)	128	39	0.305	2	0.581
	No	217 (56.51)	161	56			
In the past one week did you touch your eyes, nose, or mouth with unwashed hands?	Yes	251 (65.36)	191	60	0.271	2	0.602
	No	133 (34.64)	98	35			
Are you practicing good respiratory requirements, including covering coughs and sneezes?	Yes	160 (41.67)	119	41	0.115	2	0.734
	No	224 (58.33)	170	54			
Did you closely contact with people who are sick in any kinds of diseases?	Yes	155 (40.36)	123	32	2.34	2	0.126
	No	229 (59.64)	166	63			
Are you currently staying at home?	Yes	103 (26.82)	78	25	0.016	2	0.898
	No	281(73.18 )	211	70			
Are you maintaining making social distance when walking with the people in the past one week?	Yes	45 (11.72)	31	14	1.111	2	0.292
	No	339 (88.28)	258	81			
Did you shake some bodies hand in the past one week?	Yes	58 (15.10 )	46	12	0.601	2	0.438
	No	326 (84.90)	243	83			
Do you have sanitizer in your home?	Yes	253 (65.89)	190	63	0.010	2	0.919
	No	131 (4.11)	99	32			

Table 4: Practice of the students regarding to COVID-19 prevention with field of study difference

In this practice of the students there is also different finding among fields of the students. In one of the question “In recent days, have you worn a mask when leaving home?” there is great difference among the responses 48.17% natural science students agree versus 14.84% social science students agree Figure 4.

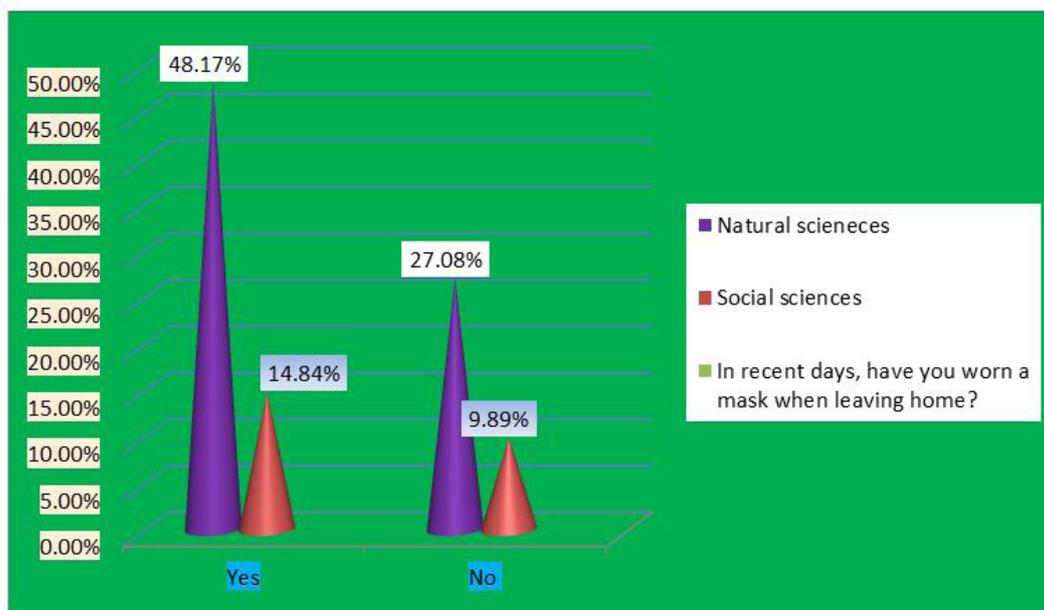


Figure 4: Fields of study based difference among practice of the students regarding to wearing face masks

## Knowledge, attitude and practice of the students toward covid-19 and associated factor

Concerning to knowledge of the students to prevent COVID-19 as recommended by WHO ; the result from this research finding showed that 155 (40.25%) of the students are knowledgeable, 165(42.85) of the students have good attitude regarding COVID-19 and 161(48.81%) of them have good practice for COVID-19 prevention.

Regarding to factors associated with KAP of the students to prevent COVID-19 infection as recommended by WHO; knowledge of the students is affected by residence. That is those students who are from urban area were 45% less likely unknowledgeable 0.55(95%CI 0.34, 0.86). Attitude of the students is also affected by fields of study and knowledge that the students have regarding to COVID-19. Students from fields of natural sciences are 54 % less likely have poor attitude for covid-19 prevention OR= 0.46(95%CI

Variables	Option	Knowledge about COVID-19		COR(95%CI)	AOR(95%CI)	P value
		Good n (%)	Poor n (%)			
Age	<=23	103(15.03)	136 (35.32)	1		
	>=23	52(13.50)	94 (24.41)	1.36(0.89, 2.09)	1.26(0.817, 1.96)	0.28
Marital status	Married	20(5.19)	52(13.50)	1		
	Single	135(35.06)	178(46.23)	0.50(0.28,0.88)	0.57(0.30, 1.06)	0.08
Residence	Rural	57 (14.80)	120(32.46)	1		
	Urban	98(25.45)	110(28.57)	0.53(0.35,0.80)	0.55(0.34,0.86)	0.010
Fields of study	social science	47 (12.20)	90(23.37)	1		
	Natural sciences	108(28.05)	140(36.36)	0.67(0.43,1.04)	1.04(0.62,1.74)	0.86
Attitude of the students toward COVID-19 and associated Factors						
Variables	Option	Attitude about COVID-19		COR(95%CI)	AOR(95%CI)	Pvalue
		Good	Poor			
Sex	Male	95	138	1		
	Female	70	82	0.80(0.53,1.21)	0.88(0.53,1.46)	0.64
Age	<=23	110	129	1		
	>=23	55	91	1.41(0.92,2.14)	1.17(0.72,1.9)	0.52
Marital status	Married	21	51	1		
	Single	144	169	48(0.27,0.84)	0.85(0.43,0.67)	0.64
Residence	Urban	64	113	1		
	Rural	10	107	0.6(0.39, 90)	1.03(0.60,1.74)	0.90
Fields of study	social sciences	41	96	1		
	Natural sciences	124	124	0.42(0.27,0.66)	0.46(0.26,0.81)	<0.01
Knowledge	Knowledgeable	107	48	1		
	Unknowledgeable	58	172	6.61(4.2,10.39)	6.47(4.06,10.33)	<0.01
Practice of the students toward COVID-19 and associated Factors						
Variables	Option	Practice about COVID-19		COR(95%CI)	AOR(95%CI)	P value
		Good practice	Poor Practice (%)			
Sex	Male	94	139	1		
	Female	67	85	0.85(0.56,1.29)	1.06(0.63,1.77)	0.810
Marital status	Married	24	48	1		
	Single	137	176	0.64(0.37,0.1)	1.11(0.56,2.22)	0.753
Residence	Urban	65	112	1		
	Rural	96	112	0.67(0.44,1.01)	0.85(0.49,1.46)	0.572
Fields of study	Natural sciences	46	91	1		
	Social sciences	115	133	0.58(0.37,0.90)	0.9(0.50,1.62)	0.742
Age	<=23	114	125	1		
	>=23	47	99	1.92(1.24,2.95)	1.88(1.13,3.1)	0.014
Knowledge	Knowledgeable	90	65	1		
	Unknowledgeable	71	159	3.1(2.02,4.73)	1.43(0.85,2.38)	0.169
Attitude	Good	114	51	1		
	Poor	47	173	8.2(5.18,13.05)	6.95(4.17,11.5)	<0.01

**Table 5:** Multivariable analysis of Knowledge, attitude and practice and associated factor of the students toward covid-19

0.26, 0.81). Students who are Unknowledgeable about COVID-19 are 6.47 times more have poor attitude for covid-19 AOR= 6.47 (95% CI 4.06, 10.33).

Age and attitude of the students are factors associated with practice of the students concerning COVID-19 prevention. That is those students with age greater than 23 are 1.88 times have poor practice for covid-19 prevention AOR= 1.88 (95% 1.13, 3.1). Those students who have poor attitude about covid-19 are 6.95 times more likely having poor practice for COVID-19 prevention (Table 5).

## Discussion

This research is the first research to be conducted in Ethiopia among higher universities students regarding Knowledge attitude and practice of higher education students toward prevention of COVID-19 and associated factors as recommended by WHO in Ethiopia. The aim of this study was to assess the knowledge, attitude and practice of higher university students toward COVID-19 prevention as recommended by World health organization and associated factors for that KAP of the students toward covid-19.

This research finding showed that university students from urban are more knowledgeable regarding covid-19 than students from rural area. This finding is in line with study conducted in Indonesian among undergraduate students [18] This may be due to during this survey the students were living with their parent due to closure of the university and those from urban parents have chance of getting more information than students from rural area. Again students from urban area update themselves frequently than rural students. The students from urban are relatively from society with great risk due to from overcrowded area. Again the governments concern is on urban then rural area and due to this the students from urban area are more knowledgeable about Covid-19 then students from rural area.

Regarding to attitude of the students regarding covid-19, this research finding indicated that students in the field of natural sciences have good attitudes than social sciences students. This finding is again supported with study conducted among undergraduate students in Indonesian, Bangladesh and Egypt [18-20]. This may be due to students from fields of natural sciences area have more information regarding severity of Corona virus infection. Natural science students have more knowledge regarding infectious diseases than social science students. This field of study may create gap regarding attitude of the students regarding Covid-19. Again the finding from this research showed that those students who have poor knowledge about covid-19 have poor attitude regarding Covid-19.

Concerning to practice to prevent corona virus infection, this study showed that those students with age greater than 23 years olds are less likely practice corona virus infection prevention. This study is in line with study conducted in Egypt [19]. This may be due to those students who are older and stayed in the university ignore every thing and consider them as simple. Again relatively younger students are freshman and they fear everything.

## Conclusion and recommendation

Knowledge of the students for covid-19 is affected by residence of the students that is students from rural area have poor knowledge. Attitude of the students regarding covid-19 is affected by fields of study and knowledge of the students about covid-19. Again practice of the students for covid-19 prevention is affected by attitude of the students regarding COVID-19 and ages of the students. Still there is no adequate achievement regarding to knowledge attitude and practice of higher university students in Ethiopia. There is also different KAP of the students based on gender, residence and fields of study. If the government is going to open the university it is better to identify in this weakness area among the students and act upon it.

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