ORIGINAL RESEARCH

Knowledge, Attitude, and Precautionary Measures Towards COVID-19 Among Medical Visitors at the University of Gondar Comprehensive Specialized Hospital Northwest Ethiopia

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Background: Novel coronavirus disease 2019 (COVID-19) is an emerging respiratory disease caused by severe acute respiratory syndrome coronavirus. It was designated a public health emergency of international concern on January 30, 2020. COVID-19 has no effective treatment; nonetheless, early recognition of the disease and applying prevention strategies will help to mitigate the virus propagation.

Objective: This study aimed to assess the knowledge, attitude, and precautionary measures of medical center visitors at the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia.

Methods: An institutional-based cross-sectional study was conducted from July 15 to August 15, 2020. A consecutive sampling technique was used to select the study participants. Data were collected by using a pre-tested structured, self-administered questionnaire. Data were analyzed using SPSS version 20. To explain the study variables, frequency tables, figures, and percentages were used. Bivariable and multivariable logistic regressions were used to see the association between independent and dependent variables.

Results: The prevalence of poor knowledge, attitude, and precautionary measures was 42.2%, 39%, and 41.6%, respectively. Being female (AOR=2.79, 95% CI=1.752–4.44), divorced (AOR=0.29, 95% CI=0.09–0.88), and residing in a rural location (AOR=1.93, 95% CI=1.07–3.26) were significantly associated with poor knowledge. Being female (AOR=95%, CI=1.21–2.98), a farmer (AOR=4.13, 95% CI=1.60–10.63), residing in a rural location (AOR=2.53, 95% CI=1.31–4.88), poor knowledge (AOR=2.38, 95% CI=1.52–3.72), and negative attitude (AOR=3.25, 95% CI=2.07–5.09) were significantly associated with poor precautionary measures. Increasing income in one unit of Ethiopian birr (ETB) (AOR=0.26, 95% CI=0.031–0.051) was significantly associated with negative attitude.

Conclusion: The finding of this study showed that more than one-third of the participants had poor knowledge, attitude, and precautionary measures towards COVID-19 disease. A comprehensive health education program concerning knowledge, attitude, and precautionary measures toward COVID-19 ought to be strengthened.

Keywords: coronavirus, COVID-19, attitude, knowledge, precautionary measures

Introduction

Novel Coronavirus disease 2019 (COVID-19) is an emerging respiratory disease caused by a positive-sense of Ribonucleic Acid (RNA) virus, Severe Acute Respiratory Syndrome Coronavirus (SARS 2-COV-2) virus.[1] This disease was

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originally classified under zoonotic diseases, which is transmitted animal to human, and human to human. Those patients confirmed with COVID-19 have a clinical symptom of fever, cough, shortness of breath, and sore throat within 14 days of the incubation period.[2,3] COVID-19 is transmitted from human to human through feco–oral, direct contact, and air way droplets.[4]

According to the World Health Organization (WHO), COVID-19 has been a public health emergency of international concern since January 30, 2020.[5] Globally, there were an estimated 21,294,845 confirmed cases and nearly one million (761,779) deaths according to a WHO report on August 21, 2020, in 216 countries.[6] Ethiopia became one of the COVID-19 affected countries on March 15. As the Ethiopia Ministry of Health report on August 23, 2020, there were a notified 39,033 cases and over 662 deaths in Ethiopia.[7]

After the pandemic nature of the diseases, countries take different preventive measures including, people movement restriction, staying at home and closure of the schools and different social services.[8,9] Following the WHO declaration, Ethiopia has implemented preventive measures to halt the pandemic nature of this disease. This includes school closure, staying at home, keeping social distance, appropriate handwashing in places of common use, like the bank, market, and church/mosques, and declaring it a state emergency at national level.[10,11]

COVID-19 has no effective treatment, nonetheless early recognition of the symptoms of the disease and timely looking for supportive care and the preventive measures will help to mitigate the virus propagation. Older people with medical comorbidities are more likely affected and lead to poor outcomes. A severe case of the disease can lead to respiratory failure, acute respiratory distress syndrome, cardiac failure, and finally death of the patient.[12,13] Studies show that COVID-19 can be associated with factors like sex, educational level age, residency level income, and marital status of the study participants.[14–16]

Appropriate knowledge, attitude, and precautionary measures towards COVID-19 have been recommended to control the spread of this disease.[17] Good knowledge, attitude, and precautionary measures (KAP) towards COVID-19 plays an essential role to determine the public readiness to assess the behavioral change measures from health experts. Up to the knowledge of the researcher, this study was not done in the study setting, so it can provide the baseline information to determine the type of intervention that may be acquired to change misunderstandings about the virus.

Even though there is a strong recognition of public health importance towards COVID-19 by the Ethiopia government, there is a strong need to emphasize community awareness and precautionary measures to stop the nationwide spread of the virus. Therefore, this study intended to assess KAP that inform communication and community commitment efforts to combat against COVID-19 transmission.

Assessment of KAP of COVID-19 among the public would provide a better understanding to address the poor knowledge, attitude, and precautionary measures about the disease and develop preventive strategies to tackle further transmission of the disease.

Furthermore, the survey predicts that the overall picture of COVID-19 prevention and readiness of the government for future preparation of health crises and pandemic control measures.

Methods

Study Design and Period

An institutional-based cross-sectional study design was conducted from July 15 to August 15, 2020.

Study Setting

The study was conducted at the University of Gondar Comprehensive Specialized Hospital (UOGCSH) medical unit visitors Gondar town, Northwest Ethiopia. As other health institutions of the country, UOGCSH gives referral and specialized diagnostic and treatment services for clients. The UOGCSH gives quarantine of the suspected cases, treatment, and follow-up of COVID-19 patients by providing more than 320 beds.

Population and Sample

All visitors who attended the UOGCSH were the source population, whereas all visitors who attended the UOGCSH during the study period were the study population. The visitors' were selected from different wards, which were from the emergency, inpatient, outpatients, and other specialized clinics (maternal, TB/HIV).

Inclusion and Exclusion Criteria

All visitors who attended the UOGCSH during the study period were included in the study, while visitors who were severely ill and health professionals were excluded from the study.

Sample Size and Sampling Method

A single population proportion formula was used to estimate the sample size, $n = (Z\frac{\alpha}{2})2 * p(1-p)/(d)2$.

From the formula "n" denote sample size," $\frac{\alpha}{2}$ " is the reliability coefficient of standard error at 5% level of significance with z=1.96, "p" is proportion, and "d" is the level of standard error. The prevalence (p) used was 41.3%, which was taken from a study done in Jimma medical center.[18] Using these values, the sample size was estimated as 373. By adding a possible non-response rate, the final sample size was estimated to be 392. A consecutive sampling method was employed to recruit the study participants.

Data Collection Tool and Procedure

A data collection tool was adapted from the WHO and similar study done in Ethiopia, which was conducted in Jimma medical center and Addis Zemen hospital.[14,18] The questionnaire incorporates socio-demographic characteristics and KAP questions. The data was collected in the site using a pretested, translated, structured interviewer administered questionnaire by four trained BSc nurses (three actual data collecors and one supervisor) applying preventive practices of COVID-19 transmission.

Knowledge was assessed by using a 16 items questionnaire, with "Yes" (1 point) and "No" (0 point) options. The total knowledge score ranged from 0–16. The overall level of knowledge was assessed using Bloom's cut-off point. Based on this cut-off point, the score between 80–100% (12.8–16 points) was good knowledge, 60–79% (9.6–12.7 points) moderate knowledge, and less than 60% (<9.6 points) was scored as poor knowledge. Likewise, the questionnaire assessed with 15 precautionary measures questions with response of "Yes" (assigned as 1 point) and "No" (assigned as 0 point) options. The total precautionary measures scorewas also assessed using the same Bloom's cut-off point. Based on this cut-off point, 80–100% (12–15 points) good precautionary measures, 60–79% (9–11.9 points) moderate precautionary measures, and less than 60% (<9 points) were scored as poor precautionary measures. Attitude was also assessed by 14 questions. The total attitude score was assessed using the same Bloom's cut-off point as positive attitude if the score was 80–100% (11.2–14 points), fair attitude if the score was 60–79% (8.4–11.1 points), and negative attitude if the score was less than 60% (<8.4 points).[19]

Data Quality Control

Data quality was assured by pretest of the questionnaire at Bahirdar Felege Hiwot referral hospital on 5% (19 visitors) of the total sample before the actual data collection period. Based on the finding, the questionnaire was assessed and modified in a clear context. The Cronbach's alpha of the questionnaire was done, and estimated as 0.83, 0.78, and 0.79 for knowledge, precautionary measures, and attitude questions, respectively, to see the internal consistency of the questionnaire. Trained data collectors collected the data.

Data Processing and Analysis

The collected data was checked for its completeness and entered in the Epi info version 7. The data was exported to Statistical Package for Social Science (SPSS) version 20 software for analysis. The data was then re-coded, cleaned with appropriate statistical analysis using SPSS. Descriptive statistics such as frequency and percentage was used. Tables and graphs were used to describe the sample characteristics and response to questionnaire items. Model fitness was checked by using Hosmer-Lemeshow goodness of fit test (P=0.64) and interpreted as a model fitted. All variables fulfilled the chi-square assumption and checked its odds ratio. Multicollinearity was cheeked using variance inflation factor (VIF) and its values lies within 1–10, which was interpreted as no multicollinearity. Bivariable and multivariate logistic regression analysis were used to identify associated factors. Those variables with P-values less than 0.2 in bivariable analysis were entered to multivariable analysis. A backward selection process was used to see the final associated variables. Those variables with a P-value less than 0.05 with 95% confidence interval were considered as significantly associated with outcome variables. Linear regression analysis also applied for those continuous variables.

Results

Socio-Demographic Characteristics

Among 392 study participants, 387 (98.5%) participated in the study. Out of the 387 participants, 203 (52.5%) were males. The mean age of participants was 29.58 years (SD ±5.62) with a range of 20–49 years. Half (197, 50.9%) of the participants were in the age group of 20–30 years and more than half of the participants (201, 51.9%) were single. Regarding the educational level, the majority (345, 89.1%) of them could read and write. From the

total participants, 133 (34.4%) were farmers. Among the total participants, 336 (86.8%) were living in a rural location. The average monthly income of the participants was 5,765 Ethiopian Birr (ETB) (SD ±1,808.9) (Table 1).

Knowledge of Hospital Visitors Towards COVID-19

The overall prevalence of poor knowledge among hospital visitors towards COVID-19 was 44.2%, with 95% CI=39.3–49.1%. Among the total participants, 224 (57.9%) responded correctly to the main clinical symptoms of COVID-19. About half (189, 48.8%) of participants knew the elderly who had chronic illness and suppressed immunity were more likely infected with COVID-19. Among the total participants, more than half, 230 (59.4) knew that traveling to an infectious area or having contact with someone who had traveled to an area where the infection was present is a risk of developing an infection. About half (212, 54.8%) of the participants knew that people who have contact with someone

infected with the COVID-19 virus should be immediately isolated in the proper place to prevent the spread of COVID-19 transmission (Table 2).

Associated Factors of Visitors Knowledge Towards COVID-19

In multivariable logistic regression analysis, variables such as female sex, divorced marital status, and rural residency were significantly associated with poor knowledge about COVID-19. The odds of poor knowledge towards COVID-19 was 2.9-times more likely (AOR=2.79, 95% CI=1.752–4.44) in female than in male participants. Participants who were divorced (AOR=0.29, 95% CI=0.09–0.88) were 71% less likely to have poor knowledge than a single one. The odds of poor knowledge in rural residency were 1.67-times (AOR=1.93, 95% CI=1.07–3.26) more likely than urban residency (Table 3).

Attitude of Hospital Visitors Towards COVID-19

The overall prevalence of negative attitude among hospital visitors towards COVID-19 was 41.6% with 95% CI=37–46.5%. One hundred and twenty-three (31.8%) participants assumed that they had low risk of infection with COVID-19 and 183 (47.3%) participants perceived they had very low protection from COVID-19. One hundred and fifty-one (39%) participants perceived that they could be infected easily with COVID-19. Among the total participants, 132 (34.1) supposed that they had difficulty in washing hands frequently for 20 seconds with soap or using sanitizer. Avoiding touching face with unwashed hands, shaking others, and attending in a crowded population were assumed easy for about 118 (30.5%), 122 (31.5%), and 155 (40.1%), respectively. Practicing physical distancing, covering the mouth or nose during cough or sneeze elbow/or tissue and avoid close contact with sick people were perceived as very easy by 147 (38%), 124 (32%), and 155 (40.1%), respectively (Table 4).

Associated Factors of Visitors Attitude Towards COVID-19

In this study variable, factors like marital status, residency, and income were entered into multivariable logistic regression. In multivariable logistic analysis, only the level of income was statistically significantly associated with the negative attitude of participants towards COVID-19.

Table 1 Socio-Demographic Characteristics Visitors in UOGCSH, 2020 (N=387)

Variables	Category	N	Percent (%)
Sex	Male Female	203 184	52.5 47.5
Age	Mean (±SD) of age (in years)	29.58	±5.62
Marital status	Single Married Divorced	201 164 22	51.9 42.4 5.7
Occupation	Farmer Government employee Currently unemployed Private employee Student	133 33 52 79 90	34.4 8.5 13.4 20.4 23.3
Educational level	Cannot read and write Read and write Secondary school and above	17 345 25	4.4 89.1 6.5
Residency	Urban Rural	51 336	13.2 86.8
Income (ETB)	Mean (±SD) of age (in years)	5,765	±1,808.9

Abbreviations: ETB, Ethiopian birr; UOGCSH, University of Gondar Comprehensive Specialized Hospital; SD, standard deviation.

Table 2 Knowledge of COVID-19 Among Visitors of UOGCSH, 2020 (N=387)

Knowledge Questions	Frequency	
	Yes, N (%)	No, N (%)
Main clinical symptom of COVID-19 is fever, cough, shortness of breath, and fatigue	224 (57.9)*	163 (42.1)
Unlike the common cold, stuffy nose, running nose, and sneezing are less common in persons infected with COVID-19 virus	198 (51.2)*	189 (48.8)
COVID-19 symptoms appear within 2–14 week	296 (76.5)*	91 (23.5)
Currently, there is no effective treatment or vaccine for COVID-19, but early supportive treatment can help most patients to recover from infection	300 (77.5)*	87 (22.5)
Not all persons with COVID-19 will develop severe cases. Those who are elderly, have chronic illness, and suppressed immunity are more likely to have severe cases	189 (48.8)*	198 (51.2)
Touching or shaking hands of an infected person would result in being infected by COVID-19	161 (41.6)*	226 (58.4)
Touching an object or surface with the virus on it, touching your mouse,nose, or eye with unwashed hands would result in infection by COVID-19 virus	217 (56.1)*	170 (43.9)
The COVID-19 virus was spread via respiratory droplet of infected individuals	192 (49.6)*	195 (50.4)
Persons with COVID-19 cannot spread the virus to others if they have no symptoms of COVID-19	235 (60.7)	152 (39.3)*
Wearing a mask when moving out of home is important to prevent infection with COVID-19 virus	201 (51.9)*	186 (48.1)
Children and young adults do not need to take measures to prevent the infection by COVID-19 virus	216 (55.8)	171 (44.2)*
Washing hands frequently with soap and water for at least 20 seconds or use of an alcohol based sanitizer (60%) is important to prevent infection with COVID-19	205 (53)*	182 (47)
To prevent COVID-19 infection individuals avoid going to crowded place such as public transportation, market, religious place hospital, and work place	202 (52.2)*	185 (47.8)
Traveling to an infectious area or having contact with someone who has traveled to an area where infection is present is a risk for developing infection	157 (40.6)*	230 (59.4)
Isolation and treatment of COVID-19 patients are effective ways to reduce the spreadof the COVID-19 virus	210 (54.3)*	177 (45.7)
People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place	212 (54.8)*	175 (45.2)
The overall level of knowledge		
Good	135 (34.8)	
Moderate	81 (21)	
Poor	171 (44.2)	

Note: *Indicates that frequency of correct response.
Abbreviations: COVID-19, novel coronavirus disease 2019; UOGCSH, University of Gondar Comprehensive Specialized Hospital.

In this study a one ETB increase of the monthly income was associated with a 74% decrease (AOR=0.26, 95% CI=0.031–0.051) of having poor attitude (Table 5).

Precautionary Measures of Hospital Visitors

The overall prevalence of poor precautionary measures among hospital visitors towards COVID-19 was 39%, with 95% CI=34.9–43.7%.

Among the total participants, the majority (228, 58%) of them participate or visit crowded places like church/mosque, market, bank, and others. In recent days, around 293 (75.7%) participants had worn a mask when leaving home, however about 207 (53.5%) and 245 (63.3) participants were touching the front of the mask when taking it off and reuse the mask for a long time, respectively. Among the total participants, 263 (68%) were well used precautionary measures of washing hands with soap and water frequently for at least 20 seconds

Table 3 Cross-Tabulation of Socio-Demographic Variables with Participants' Knowledge About COVID-19 Among Visitors of UOGCSH, 2020 (N=387)

Variables	Poor Knowledge		OR (95%) CI	
	Yes (n=171)	No (n=216)	COR	AOR
Sex				
Male	113 (29.2)	90 (23.2)	1	1
Female	58 (15)	126 (32.6)	2.73 (1.79–4.14)	2.79 (1.75–4.44)**
Age	31.47±6.4	28.09±4.4	0.25 (0.107–1.240)	0.17 (0.10–1.23)
Marital status				
Single	79 (20.4)	122 (31.5)	1	1
Married	76 (19.7)	88 (22.7)	0.75 (0.49–1.14)	0.72 (0.42–1.2)
Divorced	16 (4.1)	6 (1.6)	0.24 (0.09–0.65)	0.29 (0.09–0.88)*
Occupation				
Government employed	19 (4.9)	14 (3.6)	1	1
Private employed	30 (7.8)	49 (12.7)	2.22 (0.970–5.07)	1.43 (0.57–3.63)
Farmer	65 (16.8)	68 (17.6)	1.42 (0.658–3.06)	0.84 (0.35–1.99)
Currently unemployed	19 (4.9)	33 (8.5)	2.36 (0.96–5.75)	1.79 (0.662–4.87)
Student	38 (9.8)	52 (13.4)	1.86 (0.828–4.16)	1.23 (0.49–3.08)
Educational level				
Cannot read and write	5 (1.3)	12 (3.1)	1	1
Read and write	152 (39.3)	193 (49.9)	0.52 (0.182–1.53)	0.53 (0.167–1.707)
Secondary and above	14 (3.6)	11 (2.8)	0.33 (0.09–1.21)	0.36 (0.08–1.59)
Residency				1
Urban	30 (7.8)	21 (5.4)	1	
Rural	141 (36.4)	195 (50.4)	1.97 (1.08–3.59)	1.67 (1.07–3.26)*
Income (ETB)	5929.3±2073.7	5635.1±1560.8	0.59 (0.11–0.1.5)	0.57 (0.01–1.2)

Notes: *Statistically significant (*P*-value<0.05); **Statistically highly significant (*P*-value<0.01).
Abbreviations: AOR, adjusted odds ratio; COR, crude odds ratio; ETB, Ethiopian birr; UOGCSH, University of Gondar Comprehensive Specialized Hospital.

or use sanitizer/60% sanitizer. The majority, 263 (68%) of the participants were touching their eyes, nose, and mouth frequently with unwashed hands. One hundred and sixty-three (42.1%) participants were practiced in cleaning and disinfecting frequently touched objects or surfaces. More than half (198, 51.2%; and 226, 58.4%) of the participants were applying the precautionary measures of physical distancing by 2 meters away at all times and eat or drink in bar and restaurant, respectively. Among the total participants, about 178 (46%) preferred not to stay at home during the transmission period. Less than half (164, 42.4%) of participants listened to and followed the direction of state local authorities (Table 6).

Associated Factors of Visitors Precautionary Measures Towards Prevention of COVID-19

In the multivariable logistic regression analysis, variables such as sex, occupation, residency, poor knowledge, and

poor attitude were statistically significantly associated with poor precautionary measures towards COVID-19.

The odds of poor precautionary measures were 1.9-times (AOR=1.9, 95% CI=1.21–2.98) more likely in female participants than male participants. Participants who were currently unemployed were 4.13-times (AOR=4.13, 95% CI=1.60–10.63) more likely to have poor precautionary measures than government employees. The odds of poor precautionary measures were 2.62-times (AOR=2.62, 95% CI=1.08–6.33) higher in farmers than their counterparts. In rural residency participants, the odds of poor precautionary measures were 2.53-times (AOR=2.53, 95% CI=1.31–4.88) more likely than urban residence participants. The odds of poor precautionary measures were 2.38-times (AOR=2.38, 95% CI=1.52–3.72) higher in those having poor knowledge than their counterparts. Participants who had a negative attitude were 3.25-times (AOR=3.25, 95% CI=2.07–5.09) more likely to use poor precautionary measures than their counterparts (Table 7).

Table 4 Attitude of COVID-19 Among Visitors of UOGCSH, 2020 (N=387)

Attitude Questions	High	Moderate	Low	Very Low
	N (%)	N (%)	N (%)	N (%)
Level of risk of infection with COVID-19	93 (24)	66 (17.1)	123 (31.8)	105 (27.1)
How much you protect yourself from the disease?	60(15.5)	62 (16)	82 (21.2)	183 (47.3)
Being infected with COVID-19 to you is	68 (17.6) Highly threatening	48 (12.4) Moderately threatening	151 (39) Easy	120 (31) Not known
Washing hands frequently for 20 seconds with soap or using sanitizer is	87 (22.5) very easy	73 (18.9) Easy	132 (34.1) Difficult	94 (24.3) Very difficult
Avoiding touching face with unwashed hands	117 (30.2)	83 (21.4)	118 (30.5)	69 (17.8)
Avoid shaking others	124 (32)	84 (21.7)	122 (31.5)	57 (14.7)
Avoiding attending in a crowded population	105 (27.1)	68 (17.6)	155 (40.1)	59 (15.2)
Practicing physical distancing	147 (38)	92 (23.8)	110 (28.4)	38 (9.8)
Covering mouth or nose during cough or sneeze elbow/or tissue	124 (32)	77 (19.9)	126 (32.6)	60 (15.5)
Avoid close contact with sick people	155 (40.1)	104 (26.9)	77 (19.9)	51 (13.2)
Using a mask when leaving home	122 (31.5)	91 (23.5)	122 (31.5)	52 (13.4)
Listening and following the direction of state and local authorities	148 (38.2)	92 (23.8)	95 (24.5)	52 (13.4)
Isolating oneself if get sick to avoid the spread	109 (28.2)	81 (20.9)	146 (37.7)	51 (13.2)
Staying at home to minimize infection	155 (40.1)	87 (22.5)	102 (26.4)	43 (11.1)
The Overall level of attitude				
Positive	118 (30.4)			
Fair	108 (28)			
Negative	161 (41.6)			

Abbreviations: COVID-19, novel coronavirus disease 2019; UOGCSH, University of Gondar Comprehensive Specialized Hospital.

Discussion

This study assessed the knowledge, attitude, and precautionary measures of COVID-19 following the pandemic nature of the disease. Therefore, this study would inform public health education and commitment to mitigate the spread of COVID-19 virus.

The overall prevalence of poor knowledge towards COVID-19 among hospital visitors was 44.2%. This finding was higher than the studies done in Ethiopia,[14,15,18] Kenya,[20] Uganda,[21,22] China,[23] India,[24] Italy,[25] and Saudi Arabia.[26] The finding was in line with the study done in the US.[16] This might be due to the assessment tool used and studies data collection time. In studies done in China, India, Italy, and Saudi Arabia, data collection was done in the meantime of the outbreak in which most of the study

population were aware of a lot of information about COVID-19. However, most of this study population were rural residents, who had no access towards COVID-19 related information due to the lack of mobile network and mass media.[27,28] In addition, the majority of these study participants were farmers. This group of participants mostly illiterate and had difficulty to access information about COVID-19.[29]

The odds of poor knowledge towards COVID-19 was 2.9-times more likely in females than male participants. This finding was in line with the studies done in Ethiopia,[14,18] Malaysia,[30] Saudi Arabia,[26,31] Paraguay,[32] and the US.[16] The possible explanation might be due to extraordinary activities of females as compared with males such as cooking, washing, and preparing for daily home consumption. Therefore, they

Table 5 Cross-Tabulation of Socio-Demographic Variables with Participants' Attitude About COVID-19 Among Visitors of UOGCSH, 2020 (N=387)

Variables	Negative Attitude		OR (95%) CI	
	Yes (n=161)	No (n=226)	COR	AOR
Sex				
Male	88 (22.7)	115 (29.8)	1	
Female	73 (18.7)	111 (28.8)	1.16 (0.77–1.74)	
Age	29.31±5.21	29.96±6.157	0.12 (0.02–1.29)	0.07 (0.04–1.23)
Marital status				
Single	74 (19.1)	127 (32.8)	1	1
Married	75 (19.4)	89 (23)	0.69 (0.45–1.05)	0.890 (0.560–1.41)
Divorced	12 (3.1)	10 (2.6)	0.49 (0.20–1.18)	0.48 (0.19–1.22)
Occupation				
Government employed	12 (3.1)	21 (5.4)	1	
Private employed	33 (8.5)	46 (11.9)	0.79 (0.34–1.84)	
Farmer	56 (14.5)	77 (19.9)	0.79 (0.36–1.73)	
Currently unemployed	20 (5.2)	32 (8.3)	0.91 (0.37–2.25)	
Student	40 (10.3)	50 (12.9)	0.71 (0.31–1.62)	
Educational level				
Secondary and above	6 (1.6)	11 (2.8)	1	1
Read and write	143 (36.9)	202 (52.2)	0.77 (0.28–2.131)	
Cannot read and write	12 (3.1)	13 (3.4)	0.59 (0.17–2.09)	
Residency				
Urban	17 (4.4)	34 (8.8)	1	1
Rural	144 (37.2)	192 (49.6)	1.50 (0.806–2.79)	1.49 (0.782–2.83)
Income (ETB)	5,409.42±403.94	6,264.32±2,166.4	0.230 (0.041–0.061)	0.26 (0.031–0.051)**

Note: **Statistically significant (*P*-value less 0.05).
Abbreviations: AOR, adjusted odds ratio; COR, crude odds ratio; ETB, Ethiopian birr; UOGCSH, University of Gondar Comprehensive Specialized Hospital.

might have less time to read and scale up their knowledge by far.[33]

Participants with divorced marital status (AOR=0.29, 95% CI=0.09–0.88) were 71% less likely to have poor knowledge than a single one. This finding was supported by the study done in Ethiopia.[14] The possible explanation might be due to those divorced being less equipped, with better-shared information being available when married than being single.

The odds of poor knowledge in rural residency were 1.673-times more likely than urban residency. This result was in line with the studies done in Ethiopia,[14,15] Kenya,[34] Sub- Saharan,[35] and China.[36] This might be due to a lack of health information to an individual being accessed by the online technology to develop their knowledge and practice level. Such a group population could not access information due to the poor mobile network system and lack of mass media in the rural area.[29] In addition, the rural population in Ethiopia were illiterate, making it too difficult to understand and access health information.[37,38]

The overall prevalence of negative attitude among hospital visitors towards COVID-19 was 41.6%. This finding was lower than the study conducted in Uganda.[21,22] The possible explanation might be due to the majority of the participants in Uganda (54%), and were secondary level education which might have positive attitude towards COVID-19.

In this study a one-unit increase in ETB of the monthly income was associated with a 74% decrease (AOR=0.26, 95% CI=0.031–0.051) of having a poor attitude. This might be due to the economical level of an individual, can influence the behavioral aspect of the health status of an individual.[39] This finding was also supported by pieces of evidence, which highlights low monthly income, and can influence once feeling towards behavioral aspects of an individual's.[40–42]

The prevalence of poor precautionary measures among hospital visitors towards COVID-19 was 39%. This finding was lower than the study done in Ethiopia[14] and higher

Table 6 Precautionary Measures of COVID-19 Among Participants' of UOGCSH, 2020 (N=387)

Questions	Frequency	
	Yes, N(%)	No, N(%)
Do you participate in meeting in any crowded place in areas with ongoing community transmission?	228 (58.9)	159 (41.1)*
In recent days, have you worn a mask when leaving home?	293 (75.7)*	92 (23.8)
If you yes, do you touch the front of the mask when taking it off?	207 (53.5)	178 (46)*
Do you reuse the mask?	245 (63.3)*	142 (36.7)
Do you wash your hands with soap and water frequently for at least 20 second or use sanitizer/60% sanitizer?	263 (68)*	124 (32)
Do you touch your eyes, nose, and mouth frequently with unwashed hands?	263 (68)	124 (32)*
Do you clean and disinfect frequently touched objects or surfaces?	163 (42.1)*	224 (57.9)
Do you practice "physical distancing" by 2 meters away at all time?	198 (51.2)*	189 (48.8)
Do you use other workers phone, desk office, or other equipment?	162 (41.9)	225 (58.1)*
Do you limit contact (such as handshake)?	180 (46.5)*	207 (53.5)
Do you eat or drink in bar and restaurant?	226 (58.4)*	161 (41.6)
Do you cover your mouth and nose during coughing and sneezing with elbow or tissue, then throw the tissue in the trash?	160 (41.3)*	227 (58.7)
Do you prefer to stay at home, in room with window open during the transmission period?	178 (46)*	209 (54)
Do you stay at home when you are sick due to common cold-like infection during the transmission period?	191 (49.4)*	196 (50.6)
Do you listen and follow the direction of your state local authorities?	164 (42.4)*	223 (57.6)
The overall level of practice		
Good Moderate Poor	124 (32) 112 (29) 151 (39)	

Note: *Indicates that frequency of correct response.
Abbreviations: COVID-19, novel coronavirus disease 2019; UOGCSH, University of Gondar Comprehensive Specialized Hospital.

than the study done in Uganda.[21,22] The finding was also inconsistent with studies done in China[23] and Iran.[43] The possible reason might be due to the information and knowledge gap to apply recommended actions towards prevention of COVID-19. The health authority commitment towards tackling of COVID-19 might be another discrepancy in the result.

Participants who were currently unemployed had 4.13-times more poor precautionary measures than government employees. The odds of poor precautionary measures were 2.62-times in farmer participants than counterparts. This finding is consistent with the study done in Ethiopia.[15,18] This possible justification might be due to the lack of different sources of information, frequency of media exposure, and the difference in behavior of an individual to apply the recommended prevention mechanism of COVID-19.

In rural residency participants, the odds of poor precautionary measures were 2.53-times more likely than urban residency. This finding is in line with studies in Ethiopia,[14] Kenya,[34] Sub-Saharan,[35] and China.[36] The possible justification might be due to the inadequate availability of basic needs, such as water, drainage, waste collection, and ventilated housing, which leads to poor performance to apply precautionary measures.[44]

Participates with poor precautionary measure were 2.38- and 3.25-times more likely to have poor knowledge and negative attitudes, respectively. This finding is in line with studies done in Ethiopia[14] and China.[23] This might be due to the fact that knowledge is the precondition to have good precautionary measures and a positive attitude towards COVID-19. Conveying equipped knowledge of COVID-19

Table 7 Cross-Tabulation of Socio-Demographic Variables with Participants' Precautionary Measures About COVID-19 Among Visitors of UOGCSH, 2020 (n=387)

Variables	Poor Precautionary Measures		OR (95%) CI	
	Yes (N=151)	No (N=236)	COR	AOR
Sex				
Male	94 (24.3)	109 (28.2)	1	1
Female	57 (14.7)	127 (32.8)	1.92 (1.27–2.92)	1.9 (1.21–2.98)**
Age	30.03±5.33	29.29±5.8	0.064 (0.014–1.04)	0.063 (0.014–1.03)
Marital status				
Single	76 (19.6)	125 (32.3)	1	1
Married	63 (16.3)	101 (26.1)	0.97 (0.64–1.49)	0.85 (0.53–1.37)
Divorced	12 (3.1)	10 (2.6)	0.51 (0.21–1.23)	0.56 (0.21–1.5)
Occupation				
Government employed	24 (6.2)	9 (2.3)	1	1
Private employed	26 (6.7)	53 (13.7)	5.43 (2.21–13.34)	4.13 (1.60–10.63)*
Farmer	58 (15)	75 (19.4)	3.45 (1.49–7.98)	2.62 (1.08–6.33)**
Currently unemployed	12 (3.1)	40 (10.4)	8.89 (3.26–24.19)	7.41 (2.58–21.19)
Student	31 (8)	59 (15.2)	5.07 (2.10–12.25)	3.64 (1.45–9.19)
Educational level				
Cannot read and write	4 (1)	13 (3.4)	1	1
Read and write	131 (33.9)	214 (55.3)	0.51 (0.16–1.57)	0.55 (0.17–1.79)
Secondary and above	16 (4.1)	9 (2.3)	0.17 (0.04–0.693)**	0.19 (0.04–0.84)
Residency				
Urban	32 (8.3)	19 (4.9)	1	1
Rural	119 (30.7)	217 (56.1)	3.07 (1.67–5.65)	2.53 (1.31–4.88)**
Income (ETB)	5,879.6±2,112.4	5,691.8±1,585.2	0.051 (0.02–0.1.04)	0.038 (0.01–1.03)
Poor knowledgde				
Yes	92 (23.8)	79 (20.4)	3.09 (2.03–4.74)	2.38 (1.52–3.72)
No	59 (15.2)	157 (40.6)	1	1
Negative attitude				
Yes	93 (24)	68 (17.6)	3.96 (2.57–6.10)	3.25 (2.07–5.09)*
No	58 (15)	168 (43.4)	1	1

Notes: *Statistically significant (*P*-value<0.05); **Statistically highly significant (*P*-value,<0.01).
Abbreviations: AOR, adjusted odds ratio; COR, crude odds ratio; ETB, Ethiopian Birr; UOGCSH, University of Gondar Comprehensive Specialized Hospital.

can decrease the risk of infection by improving participants' precautionary measures.[45]

This study had certain limitations. Use of consecutive sampling is one of the limitations of this study. The cross-sectional type of this study is also of the limitation of the study that cannot clearly identify cause and effect relationships between study variables.

Conclusion

The finding of this study showed that more than one-third of the participants had poor magnitude of knowledge, attitude, and precautionary measures towards COVID-19 disease.

Female sex, divorced marital status, and rural residency of the study population were significantly associated with poor knowledge, whereas female sex, farmer, rural residency, poor knowledge, and poor attitude were significantly associated with poor precautionary measures. Furthermore, low monthly income was significantly associated with a negative attitude of the study population.

An inclusive health education program concerning knowledge, attitude, and practice toward COVID-19 should be widened for especially those study populations coming from the rural population. The government and health authorities should aid public knowledge and understanding of COVID-19.

Community engagement is also important to combat COVID-19 by addressing preventive methods. Specific health education also needed for some special groups, which had poor KAP level towards COVID-19 prevention strategies.

Abbreviations

AOR, adjusted odds ratio; COVID-19, novel coronavirus disease 2019; COR, crude odds ratio; KAP, knowledge, attitude, and precautionary measures; SARS 2-COV-2, severe acute respiratory syndrome coronavirus; WHO, World Health Organization; UOGCSH, University of Gondar Comprehensive Specialized Hospital.

Data and Material Availability

The raw data is available in online repositories as supplementary material (see supplementary file1: Table S1).

Ethical Approval and Consent of Participating

The study was performed based on the ethical standards put down in the Declaration of Helsinki. Ethical clearance was obtained from the institutional ethical review committee of the school of nursing and college of health science of University Gondar with ethical clearance letter reference number IRB 00109. The official permission letter was obtained from the University of Gondar hospital administration. After understanding the purpose of the study, written informed consent was obtained from study participants. Confidentiality of participants' information was kept.

Acknowledgment

Our deepest gratitude goes to the University of Gondar for all expenses of this research work and study participants participated in this research. The authors also would like to give togreat appreciation to the data collectors (Misganew Tilahun, Ketemaw Tsegeye, and Jember Ayalew) and supervisor (Eneye Hussien) for their contribution to this paper.

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.

Funding

The study was supported by the University of Gondar College of medicine and health science. The funding had no further role in the design, data collection, analysis, drafting, manuscript, preparation and publication of this paper.

Disclosure

The authors declare that they have no competing interests.

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