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Knowledge, attitude, and preventive practices towards COVID-19 and associated factors among adult hospital visitors in South Gondar Zone Hospitals, Northwest Ethiopia

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Abstract

Background

Coronavirus disease 2019 (COVID-19) is currently the critical health problem of the globe, including Ethiopia. Visitors of healthcare facilities are the high-risk groups due to the presence of suspected and confirmed cases of COVID-19 in the healthcare setting. Increasing the knowledge, attitude, and practices towards COVID-19 prevention among hospital visitors are very important to prevent transmissions of the pandemic despite the lack of evidence remains a challenge in Ethiopia. Therefore, this study was designed to investigate the status of knowledge, attitude, and preventive practice towards COVID-19 and associated factors among hospital visitors in South Gondar Zone Hospitals, Northwest Ethiopia.

Methods

A facility-based cross-sectional study design was employed during August 1 to 30, 2020 from randomly selected 404 adult hospital visitors in South Gondar Zone Hospitals, Northwest Ethiopia. The data was collected using interviewer-administered questionnaire. The outcome of this study was good or poor knowledge, positive or negative attitude and good or poor preventive practice towards COVID-19. Three different binary logistic regression models with 95% CI (Confidence interval) was used for data analysis. For each mode, bivariable analysis (crude odds ratio [COR]) and multivariable analysis (adjusted odds ratio [AOR]) was used during data analysis. From the bivariable analysis, variables with a p-value <0.25 were retained into the multivariable logistic regression analysis. From the multivariable logistic regression analysis, variables with a significance level of p-value <0.05 were taken as

factors independently associated with knowledge, attitude and preventive practices towards COVID-19.

Main findings

About 69.3% of the respondents had good knowledge, 62.6% had a positive attitude, and 49.3% had good preventive practice towards the prevention of COVID-19. We found that factors significantly associated with good knowledge about COVID-19 were educational status who can read and write (AOR = 2.78; 95%CI: 1.18–6.56) and college and above (AOR = 6.15; 95%CI: 2.18–17.40), and use of social media (AOR = 2.96; 95%CI: 1.46–6.01). Furthermore, factors significantly associated with a positive attitude towards COVID-19 includes the presence of chronic illnesses (AOR = 5.00; 95%CI: 1.71–14.67), training on COVID-19 (AOR = 3.91; 95%CI: 1.96–7.70), and peer/family as a source of information (AOR = 2.45; 95%CI: 1.06–5.63). Being a student (AOR = 7.70; 95%CI: 1.15–15.86) and participants who had a good knowledge on COVID-19 (AOR = 4.49; 95%CI: 2.41–8.39) were factors significantly associated with good practice towards COVID-19.

Conclusion

We found that knowledge, attitude, and preventive practices towards prevention of COVID-19 among adult hospital visitors were low. Therefore, we recommended that different intervention strategies for knowledge, attitude and preventive practices are urgently needed to control the transmission of COVID-19 among adult hospital visitors. Health education of those who could not read and write about COVID-19 knowledge issues and advocating use of social media that transmit messages about COVID-19 are highly encouraged to increase the good knowledge status of adult hospital visitors. Furthermore, providing training about COVID-19 prevention methods and using various sources of information about COVID-19 will help for improving positive attitude towards COVID-19 prevention, whereas for increasing the status of good preventive practices towards COVID-19, improving the good knowledge about COVID-19 of adult hospital visitors are essential.

Introduction

Corona virus 2019 (COVID-19) is a rapidly emerging pandemic respiratory disease caused by a novel Coronavirus of Severe Acute Respiratory Syndrome (SARS/COV-2). The disease was reported initially in Wuhan city, Hubei Province, China at the end of December 2019 [1–3]. Later on, World Health Organization (WHO) announces the disease as a public health emergency of international concern at the end of January 2020 and then declared as a global pandemic on March 11 [4–6]. Two days later, the government of Ethiopia reported the first confirmed case of COVID-19 [7, 8].

COVID-19 transmits mainly through droplets, airborne transmission, and contact between humans [6, 9–11]. The major sign and symptoms of COVID-19 cases are fever, dry cough, fatigue, myalgia, shortness of breath, and dyspnoea [4–6]. The Severe cases of the disease may lead to the developments of cardiac injury, respiratory failure, acute respiratory distress syndrome, and death. Elders and patients with chronic medical illnesses like hypertension, cardiac

disease, lung disease, cancer, or diabetes have been identified as potential risk factors for disease severity and mortality [6–11].

According to the Worldometer report, as of October 6, 2020, 9:54 am, COVID-19 spreads to more than 214 countries across the world. Worldwide, a total of 35,707,844 confirmed cases were reported. Of them, 26,907,997 were recovered and 1,049,700 died of the pandemic [12]. In the case of Ethiopia, 79,437 confirmed cases of COVID-19 were reported. Of this, 1,230 and 34,016 died and recovered, respectively [13].

Due to the absence of cure [6–11] prevention is recommended as the only strategy to prevent the spread of COVID-19. Different COVID-19 prevention measures are implemented such as respiratory hygiene, hand washing, social distancing, use of Personal Protective Equipment, and environmental disinfection [6, 14–17]. WHO designed different guidelines and online training sessions to increase the awareness of the community towards the prevention of the pandemic [18]. But still, information was deficient mainly for vulnerable groups [6, 17].

The government of Ethiopia has also implemented different prevention measures. Later on, the country declares and enforces a state of emergency for about six months since March 2020. But most populations of Ethiopia perceived that as the disease was eliminated since the termination of a state of emergency. Therefore, prevention measures towards COVID-19 are becoming neglected from time to time. Healthcare facilities are one of the vulnerable areas for transmission of COVID-19. As a result, visitors of healthcare facilities are one of the victim groups of population for COVID-19 due to close contact with suspected and confirmed cases of the disease. Occupation, sex, age, family size, marital status, residence, average monthly income, and alcohol consumption were some of the factors affecting knowledge, attitude and practices of COVID-19 [19, 20].

Even though many researchers were conducted on knowledge, attitude and preventive practices towards prevention of COVID-19, there is limited evidence on knowledge, attitude and preventive practices of healthcare facility visitors. Therefore, assessing knowledge, attitude, and practice are important measures for identifying gaps and taking intervention accordingly [4]. Therefore, the study was designed to assess the knowledge, attitude, and preventive practice of adult visitors towards COVID-19 prevention in South Gondar Zone Hospitals, Northwest Ethiopia.

Methods and materials

Study area description

South Gondar zone is one of the 13 administrative zones in the Amhara regional state of Ethiopia. Debre Tabor is its capital town which is located at 597 km and 105 km from Addis Ababa and Bahir Dar, respectively. According to the Central Statistical Agency projection of 2014–2017, the total population of the study area was 2,484,929 in 2017 of which 1,257,323 (50.6%) were males while 1,227,606 (49.4%) were females [21].

In South Gondar Zone, there are one comprehensive referral hospital found in Debre Tabor Town and seven district government hospitals found in Addis Zemen, Mekane Eyesus, Andabet, Ebenat, Arb Gebeya, Nefas Mewcha, and Wegeda twns. In addition, there are 98 government health centers, and 76 private clinics in South Gondar Zone [22]. According to the reports of hospitals in the South Gondar Zone, the average number of monthly visitors during COVID-19 was 13,440.

Study design and population

Institution-based cross-sectional study design was conducted among hospital visitors in South Gondar Zone Hospitals, Northwest Ethiopia from August 1 to 30, 2020. The source population

was all adult visitors with age of 18 and above in hospitals of South Gondar zone while the study population was adult visitors of Debre Tabor comprehensive referral hospital and Mekane Eyesus hospitals. Those who were seriously ill at the time of data collection were not included in the study.

Sample size determination and sampling methods

The sample size was determined using the single population proportion formula by taking the following assumptions.

$$n = \frac{(z_{a/2})^2 * p(1-p)}{d^2}$$

$Z_{\alpha/2}$ is the standard normal variable value at $(1-\alpha)$% confidence level (α is 0.05 with 95% CI, $Z_{\alpha/2}$ = 1.96), an estimate of the proportion of knowledge, attitude and preventive practice, was considered as 50% as there were no similar studies conducted and 5% margin of error was considered. The sample size became 384 and after considering 10% non-response rates, the adequate sample final sample size becomes 422.

After selecting the two hospitals randomly out of the 8 hospitals, we proportionally allocated the sample size based on the total estimated visitors of hospitals in the last three months. Then, 303 sample size was allocated for Debre Tabor comprehensive referral hospital and 117 for Mekane Eyesus hospitals. Then hospital visitors data during the previous 3 months in the emergency ward, surgical ward, medical ward, gynecology/obstetrics ward, and pediatrics ward considered for sample size allocation for each hospital's departments. Finally, the randomly selection of visitors for each ward was applied until the allocated sample size was achieved.

Operational definitions

Good or poor knowledge. Knowledge was measured by using 15 items of questions consisted of signs and symptoms, risk groups and prognosis, method of transmission, and /preventive methods towards COVID-19. Each question was consisted of 'Yes', 'No', and 'I do not know' options. Respondents who answered correctly were given 1 point while others were given 0 points. The total knowledge score ranges from 0–15 and a cut-off level of ≥12 (80% and above) was considered as good knowledge while <12 (80%) was considered as poor knowledge towards COVID-19 prevention [23].

Positive or negative attitude. Attitude was measured by using 11 items of questions about precautions methods for preventive practices towards COVID-19 and the response was categorized based on 3 scale measurements with agree (3 points), neutral (2 points), and disagree (1 point). The score of attitude varied from 11 to 33, with an overall mean score of ≥ 27 (81.8%) was considered as a positive attitude about precautions for preventive practices towards COVID-19, whereas a score of less than 27 (81.8%) was considered as negative attitude towards COVID-19 prevention [27].

Good or poor preventive practice. The preventive practice was measured using 10 items of questions and those who respond as yes were given 1 point while no was marked as 0. The total prevention practice score ranges from 0–10 and a score with a cut-off ≥ 8 (80%) was considered as good practice while <8 was taken as a poor practice [24, 25].

Data collection and quality assurance

Data were collected using a pre-tested structured questionnaire which was adapted from published articles in reputable journals and WHO COVID-19 guidelines [26–31]. The questionnaire consists of five sections including; part I: socio-demographic characteristics of the participants; part II; Pre-existing medical condition and sources of information towards COVID-19; part III: knowledge of the participants; part IV: Attitude of the participants; and part V: Prevention practice of COVID-19. The tool was prepared in the English version and translated to the Amharic version (local language), and re-translated back to English to ensure consistency. The tool was pre-tested using 5% of the final sample size in Andabet hospital visitors to establish the validity of the questionnaire. Based on the pre-test, appropriate amendments such as order arrangement of questions, editing of unclear questions, and avoiding irrelevant questions were done accordingly.

The data was collected using interviewer-administered method using four BSc in Environmental Health professionals and supervised by two Public Health experts (one supervisor for one hospital). Two days of training were given for data collectors and supervisors on the overall aim of the study, contents of the tool, data collection procedures and about ethical issues. Supervision was carried out on daily basis, and appropriate corrections of the collected data were done accordingly. Furthermore, double data entry was done to control data entry errors and data cleaning was carried before statistical analysis. The reliability coefficient of Cronbach's alpha was 0.76 which is an acceptable range.

Statistical analysis

Data was entered into EpiData version 4.6 and exported to the Statistical Package of the Social Science (SPSS) version 25.0 for data cleaning analysis. Descriptive statistics such as frequencies and percentages were calculated for categorical variables and mean with standard deviations for continuous variables to examine the overall distribution.

Associations between independent variables with the outcomes of knowledge, attitudes, and preventive practices towards COVID-19 were determined using a binary logistic regression model at 95% CI (Confidence interval) independently. We used three different logistic regression models: The first model (Model 1) identified factors associated with good knowledge about COVID-19, the second model (Model II) identified factors associated with positive attitudes towards precautions measures of COVID-19 and the third model (Model III) identified factors associated factors with good preventive practices towards COVID-19. For each model, bivariable analysis with (crude odds ratio [COR]) and multivariable analysis (adjusted odds ratio [AOR]) was used.

From the bivariable analysis, variables with a p-value <0.25 were retained into the multivariable logistic regression analysis. From the multivariable analysis of each model, variables with a significance level of p-value <0.05 were taken as factors independently associated with knowledge, attitude, and practices towards COVID-19. The presence of multicollinearity among independent variables was checked using standard error at the cutoff value of 2 and we found that a maximum standard error of 0.97, which indicated no multi-collinearity. Model fitness was checked using the Hosmer-Lemeshow test for Models I, II and III knowledge, had a p-value of 0.650, 0.871, and 0.913, respectively, and indicated that all models were fit.

Ethics approval and consent to participate

The study was approved by the ethical review committee of College of Health Sciences, Debre Tabor University. Permission to conduct the study was obtained from the respective hospital managers of the study site. Before the data collection, the purpose of the study was explained

and written informed consent was obtained from the study participants. Individuals who were volunteer to participate in the study were also told as they have the right to withdraw from the study at any stage of the interview. The confidentiality of the study participants was ensured by avoiding possible identifiers. Data collectors wear a facemask and keep a physical distancing of two feet. Facemask was provided for the study participants who did not wear it during the data collection.

Result

Socio-demographic characteristics of hospital visitors

A total of 404 visitors participated in the study with a response rate of 95.7%. Nearly one-third 117 (29.0%) of the study participants were lived in rural areas. Nearly two-thirds 241 (59.7%) of the study participants were females and about one-fifth 92 (22.8%) of the hospital visitors were in the age range of 20–29 years. Furthermore, the educational status of 66 (16.3%) of the study participants cannot read and write, 68 (16.8%) of the study participants occupation were farmers. and 117 (29.0%) of the respondents. Fifty six (13.9%) of the participants had either one or more chronic medical illness history (Table 1).

Knowledge of hospital visitors towards COVID-19 prevention

More than two-thirds 280 (69.3%; 95%CI; 65.1–73.8%) of the visitors had good knowledge, whereas 124 (30.7%; 95%CI; 27.2–34.9%) of them had poor knowledge about COVID-19. Almost all 388 (96.0%) of the participants heard about COVID-19 and more than three-fourth 322 (79.7%) of the participants knew as COVID-19 is a viral disease and 339 (83.9%) of them knew the major sign and symptoms of COVID-19 cases. Furthermore, more than three-fourth 320 (79.2%) of the participants knew that elders, those who had a chronic medical illness and being obese are more likely to have severe cases of COVID-19. Similarly, 283 (70.0%) of the respondents knew that COVID-19 can be transmitted from one person to another even in the absence of COVID-19 (Table 2).

Attitude of hospital visitors towards COVID-19 prevention

About two-thirds 62.6% (95%CI; 57.2–67.6%) of the hospital visitors had a positive attitude towards COVID-19 prevention, whereas 37.4% (95%CI: 32.4–42.8%) respondents had negative attitude towards COVID-19 prevention. About half 203 (50.3%) of the participants agree that the black race is not protective against COVID-19. Similarly, less than half 180 (44.6%) of the participants agreed that Ethiopia is in a good position to contain the spread of the COVID-19. About two-thirds, 274 (67.8%) of the participants believed COVID-19 does not cause stigma. More than half 221 (54.7%) of the respondents agree that they can get infected with COVID-19 if they contacted infected patients despite their good immunity. On the other hand, 55 (13.6%) of the respondents believed that COVID-19 has occurred as a result of our sin (Table 3).

Preventive practice of hospital visitors towards COVID-19 prevention

Half of the respondents 199 (49.3%) practiced the recommended COVID-19 prevention methods. The majority 378 (93.6%) of the participants washed their hands with water and soap for at least 20 seconds. Furthermore, almost nine out of ten respondents avoid handshaking practice for the prevention of COVID-19. But a relatively lower number of 338 (83.7%) participants used facemasks when they leave their home and 333 (82.4%) practiced respiratory hygiene

Table 1. Socio-demographic characteristics of adult visitors in hospitals of South Gondar zone Northwestern Ethiopia, August 1 to 30, 2020.

Variable	Category	Frequency (*n*)	Percent (%)
Sex	Male	163	40.3
	Female	241	59.7
Age (years)	<20	24	5.9
	20–29	92	22.8
	30–39	111	27.5
	40–49	94	23.2
	50–59	48	11.9
	≥60	35	8.7
Religion	Muslim	30	7.4
	Orthodox	331	82.0
	Protestant	43	10.6
Marital status	Single	83	20.5
	Married	295	73.0
	Divorced	26	6.5
Educational status	Cannot read and write	66	16.3
	Read and write	95	23.5
	Primary (1–8 grade)	36	8.9
	Secondary (9–12 grade)	29	7.2
	College and above	178	44.1
Occupation	Farmer	68	16.8
	Student	45	11.1
	Unemployed	55	13.6
	Government employer	129	32.0
	Private business worker	107	26.5
Resident	Urban	287	71.0
	Rural	117	29.0
Monthly income ($, USD)	<13.82	127	31.4
	13.82–55.26	101	25.0
	>55.26	176	43.6,
History of chronic medical illness	Yes	56	13.9
	No	348	86.1
Obtained training on COVID 19	Yes	137	33.9
	No	267	66.1
Use social media	Yes	252	62.4
	No	152	37.6
Peer as a source of information of COVID19	Yes	345	85.4
	No	59	14.6
Use TV/radio as a source of information	Yes	321	79.5
	No	83	20.5
Use religious institution as source of information	Yes	130	32.2
	No	274	67.8

*1 $USD (United States Dollars) exchange rate was 36.1914 Ethiopian Birr (ETB) during August 1 to 30, 2020.

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while coughing and sneezing. Furthermore, less than half 177(43.8%) of the participants applied to keep the recommended physical distance for the prevention of COVID-19. Staying at home was also another challenge and only less than one-third 121(30%) of the participants applied it (Table 4).

Table 2. Knowledge of hospital visitors towards COVID-19 prevention in hospitals of South Gondar zone, Northwestern Ethiopia, August 1 to 30, 2020.

Questions*	Response					
	Yes		No		I do not know	
	Frequency (*n*)	Percent (%)	Frequency (*n*)	Percent (%)	Frequency (*n*)	Percent (%)
Did you hear about COVID-19?	388	96.0	16	4.0	0	0
COVID-19 is a viral disease.	322	79.7	40	9.9	42	10.4
The major sign and symptoms of COVID-19 are dry cough, fever, and shortness of breathing.	339	83.9	33	8.2	32	7.9
Runny nose and sneezing are less common symptoms of COVID-19.	275	68.1	88	21.8	41	10.1
Elder, those who have a chronic medical illness and obese are more likely to sever the case of COVID- 19.	320	79.2	57	14.1	27	6.7
Currently, there is no effective cure for COVID-19.	331	81.9	50	12.4	23	5.7
COVID-19 virus can spread via respiratory droplets.	375	92.8	29	7.2		
Eating and contacting wild animals would result COVID-19 infection	308	76.2	53	13.2	43	10.6
Persons with COVID 19 virus can transmit the virus to others when a fever is not present	283	70.0	71	17.6	50	12.4
Proper washing hand with soap and water is one method of preventing COVID-19.	375	92.8	18	4.5	11	2.7
Wearing general masks can prevent one from acquiring infection by the COVID 19 virus	354	87.6	35	8.7	15	3.7
Children and young adults must take measures to prevent the infection by Covid 19 virus	337	83.4	45	11.1	22	5.5
To prevent the infection by COVID 19 virus individuals should avoid going to crowded places such as bus parks and avoid public transportation	352	87.1	50	12.4	2	.5
People who have contact with someone infected with COVID 19 virus should be immediately isolated in a proper place in general the observation period is 14 days	273	67.6	95	23.5	36	8.9
Isolation and treatment of people who are infected with the COVID 19 virus are effective ways to reduce the spread of the virus	295	73.0	80	19.8	29	7.2

*Mean± standard deviation = 12.25±2.45; Minimum = 2 and maximum = 15

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Table 3. Attitude of adult visitors towards COVID-19 prevention in hospitals of South Gondar zone, Northwest Ethiopia, August 1 to 30, 2020.

Questions*	Agree		Neutral		Disagree	
	Frequency (*n*)	Percent (%)	Frequency (*n*)	Percent (%)	Frequency (*n*)	Percent (%)
Black races are not protected from COVID 19 disease.	203	50.3	146	36.1	55	13.6
Wearing a well-fitting face mask are effective in preventing COVID 19 virus	268	66.4	81	20.0	55	13.6
Hand wash can prevent you from COVID 19 virus	321	79.4	77	19.1	6	1.5
Ethiopia is in a good position to contain COVID 19 virus	180	44.6	144	35.6	80	19.8
COVID 19 is not stigma and I should not hide my infection	274	67.8	90	22.3	40	9.9
If I get infected with COVID 19, I will go to the hospital as advised.	221	54.7	141	34.9	42	10.4
I can get infected with COVID 19 if I contacted an infected patient despite my good immunity.	230	56.9	100	24.8	74	18.3
COVID 19 is fatal	215	53.2	105	26.0	84	20.8
During the outbreak of COVID 19 eating well cooked and safely handled meat is safe.	249	61.6	96	23.8	59	14.6
COVID 19 patients should share their recent travel history with a health care provider.	256	63.4	85	21.0	63	15.6
Do you think that the cause of Covid-19 is not spiritual/ is it happened because of our sin?	262	64.9	87	21.5	55	13.6

* Mean ±standard deviation = **27.11±4.08**; Minimum = **17**; Maximum = **33**

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Table 4. Preventive practice of adult visitors towards COVID-19 prevention in hospitals of South Gondar zone, Northwest Ethiopia, August 1 to 30, 2020.

Questions*	Yes		No	
	Frequency (*n*)	Percent (%)	Frequency (*n*)	Percent (%)
Do you avoid handshaking to prevent covid 19?	363	89.9	41	10.1
Have you washed your hands often with soap and water for at least 20 seconds especially after you have been in a public place or after blowing your nose, coughing, or sneezing?	378	93.6	26	6.4
If soap and water are not readily available, are you applying a hand sanitizer that contains at least 60% alcohol?	309	76.5	95	23.5
Do you wear face masks repeatedly when you leave your home?	338	83.7	66	16.3
Do you coughing and sneezing into the elbow or within clothing?	333	82.4	71	17.6
In recent days have you avoid going to any crowded place?	281	69.6	123	30.4
Do you avoid eating raw animal products to prevent the COVID 19 virus?	336	83.2	68	16.8
Do you avoid touching your mouth nose and eyes with unwashed hands?	323	80.0	81	20.0
Do you keep your self 2m away from the others when you got to the public area?	177	43.8	227	56.2
Do you stay at your home after the emergent of covid 19?	121	30.0	283	70.0

*Mean ±standard deviation was 7.32±1.60 for the correctly responded questions; minimum questions correctly answered was 1 and maximum questions correctly answered was 10

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Factors associated with knowledge, attitude, and preventive practice towards COVID-19 from multivariable analysis

A multi-variable analysis from the first model indicated that educational status and use of social media as a source of information were statistically significant with the knowledge of COVID-19. The fining revealed that those who can read and write were 2.78 times more likely to have good knowledge on COVID-19 prevention methods than those who could not read and write. Similarly, participants who have college and above educational level were 6.15 (AOR = 6.15; 95%CI: 2.18–17.40) times more likely to have good knowledge than those who could not read and write. Furthermore, participants who used social media as a source of information towards COVID-19 were 2.96 (AOR = 2.96; 95%CI: 1.46–6.01) times more likely to have good knowledge than those who did not use social media (Table 5).

A multi-variable analysis from the second model revealed that those who had primary education were 6.49 (AOR = 6.49; 95%CI: 1.52–27.78) times more likely to have a positive attitude than those who could not read and write while being college and above graduated were 6.91 (AOR = 6.91; 95%CI: 2.58–14.5) times more likely to have a positive attitude than the corresponding reference group. Furthermore, visitors who had chronic medical illnesses were 5 times (AOR = 5; 95%CI: 1.71–14.67) more likely to have a positive attitude than those who did not have a chronic illness. Furthermore, participants who took training on COVID-19 prevention were 3.9 (AOR = 3.9; 95%CI: 1.96–7.70) times more likely to have a positive attitude than those who didn't take the training. Additionally, participants who used peer as a source of information towards COVID-19 prevention were 2.45 (AOR = 2.45; 1.06–5.63) times more likely to have a positive attitude than those who didn't use peers as a source of information for COVID-19 prevention (Table 6).

From the multivariable analysis of model three, we found that being a student was 7.7 times (AOR = 7.7; 95%CI: 1.15–51.86) more likely to have a good practice than farmers. Furthermore, participants who had good knowledge were 4.49 (AOR = 4.49; 95%CI: 2.41–8.39) times more likely to have a good practice about COVID-19 prevention than those who poor knowledge (Table 7).

Table 5. Factors associated with knowledge towards COVID-19 prevention among adult visitors in hospitals of South Gondar zone, Northwest Ethiopia, August 1 to 30, 2020.

Variable	Knowledge status		COR (95% CI)	AOR (95% CI)	P-value
	Good	Poor			
Age (years)					
<20	12	12	1	1	
20–29	70	22	3.18(1.25–8.09)	1.98(0.54–7.29)	0.312
30–39	82	29	2.83(1.14–6.99)	1.08(0.30–3.87)	0.091
40–49	58	39	1.61(0.65–3.97)	1.06(0.31–3.68)	0.921
50–59	33	15	2.20(0.80–6.02)	1.21(0.30–4.82)	0.793
≥60	25	10	2.50(0.84–7.40)	0.69(0.16–2.95)	0.610
Marital status					
Single	61	22	1	1	
Married	205	90	0.82(0.48–1.42)	0.88(0.42–1.82)	0.724
Divorced	14	12	0.42(0.17–1.05)	0.92(0.29–2.98)	0.891
Education					
Cannot read and write	25	41	1	1	
Read and write	54	41	2.16(1.14–4.12)	2.78(1.18–6.56)	0.021
Primary (1–8 grade)	26	10	4.26(1.76–10.31)	2.42(0.56–10.44)	0.245
Secondary (9–12 grade)	21	8	4.31(1.66–11.18)	1.54(0.25–9.56)	0.656
College and above	154	24	10.52(10.52–5.45)	6.15(2.18–17.40)	0.001
Occupation					
Farmer	23	45	1	1	
Student	33	12	5.38(2.35–12.34)	1.64(0.28–9.72)	0.591
Currently unemployed	38	17	4.37(2.04–9.36)	1.50(0.49–4.58)	0.488
Government worker	111	18	12.07(5.95–24.48)	0.83(0.16–4.19)	0.827
Private business	75	32	4.59(2.39–8.80)	0.91(0.25–3.30)	0.896
Resident					
Urban	216	71	2.52(1.60–3.96)	1.43(0.75–2.71)	0.281
Rural	64	53	1	1	
Monthly income ($, USD)					
<13.82	73	54	1	1	
13.82–55.26	67	34	1.46(0.85–2.51)	1.272(0.52–3.09)	0.600
>55.26	140	36	2.88(1.73–4.78)	1.29(0.46–3.60)	0.630
Obtained training on COVID 19					
Yes	113	24	2.82(1.70–4.67)	1.74(0.89–3.42)	0.110
No	167	100	1	1	
Use social media					
Yes	204	48	4.25(2.72–6.65)	2.96(1.46–6.01)	0.003
No	76	76	1	1	
Use of peer as a source of information of COVID19					
Yes	252	93	3.00(1.71–5.27)	1.09(0.48–2.51)	0.840
No	28	31	1	1	
Use TV/radio as a source of information					
Yes	243	78	3.87(2.34–6.40)	1.07(0.43–2.65)	0.885
No	37	46	1	1	
Use religious institution as source of information					
Yes	98	32	1.55(0.97–2.48)	0.93(0.50–1.73)	0.834
No	182	92	1	1	

1, reference category

Table 6. Factors associated with attitude towards COVID-19 prevention among adult visitors in hospitals of South Gondar zone, Northwest Ethiopia, in August 1 to 30, 2020.

Variable	Attitude		COR (95% CI)	AOR (95% CI)	p-value
	Positive	Negative			
Age (years)					
<20	12	12	1	1	
20–29	57	35	1.63(0.66–4.02)	0.42(0.12–1.46)	0.171
30–39	66	45	1.47(0.61–3.56)	0.51(0.14–1.82)	0.302
40–49	57	37	1.54(0.63–3.79)	0.94(0.28–3.21)	0.933
50–59	32	16	2.00(0.74–5.44)	1.10(0.28–4.27)	0.895
≥60	29	6	4.83(1.47–15.87)	1.65(0.33–8.42)	0.554
Religion					
Muslim	25	5	3.27(1.05–10.20)	2.18(0.50–9.58)	0.302
Orthodox	202	129	1.02(0.53–1.96)	1.49(0.64–3.48)	0.361
Protestant	26	17	1	1	
Education					
Cannot read and write	22	44	1	1	
Read and write	47	48	1.96(1.02–3.76)	2.39(0.99–5.79)	0.053
Primary (1–8 grade)	27	9	6.00(2.41–14.93)	6.49(1.52–27.78)	0.012
Secondary (9–12 grade)	21	8	5.25(2.01–13.74)	2.32(0.39–13.74)	0.35
College and above	136	42	6.48(3.49–12.01)	6.91(2.58–14.50)	<0.001
Occupation					
Farmer	22	46	1	1	
Student	36	9	8.36(3.44–20.36)	1.87(0.33–10.72)	0.481
Currently unemployed	33	22	3.14(1.50–6.58)	0.54(0.18–1.68)	0.292
Government worker	105	24	9.15(4.66–17.96)	0.61(0.12–3.05)	0.553
Private business	57	50	2.38(1.26–4.50)	0.29(0.07–1.12)	0.075
Resident					
Urban	193	94	1.95(1.26–3.02)	1.23(0.66–2.23)	0.514
Rural	60	57	1	1	
Monthly income ($, USD)					
<13.82	72	55	1	1	
13.82–55.26	61	40	1.17(0.69–1.98)	0.89(0.33–2.38)	0.826
>55.26	120	56	1.64(1.02–2.63)	0.57(0.19–1.70)	0.312
History of chronic illness					
Yes	48	8	4.19(1.92–9.12)	5.00(1.71–14.67)	0.003
No	205	143	1	1	
Obtained training on COVID-19					
Yes	113	24	4.27(2.59–7.05)	3.9(1.96–7.70)	<0.001
No	140	127	1	1	
Use social media					
Yes	179	73	2.59(1.70–3.93)	1.20(0.59–2.44)	0.631
No	74	78	1	1	
Use of peer as a source of information about COVID-19					
Yes	231	114	3.41(1.92–60.5)	2.45(1.06–5.63)	0.042
No	22	37	1	1	
Use TV/radio as a source of information about COVID-19					
Yes	221	100	3.52(2.13–5.81)	2.091(0.85–5.16)	0.113
No	32	51	1	1	

(*Continued*)

Table 6. (Continued)

Variable	Attitude		COR (95% CI)	AOR (95% CI)	*p*-value
	Positive	Negative			
Use religious institution as source of information about COVID-19					
Yes	100	30	2.64(1.64–4.23)	1.725(0.93–3.21)	0.094
No	153	121	1	1	

1, reference category

Discussion

We conducted institution based cross-sectional study to examine the status of knowledge, attitude, preventive practices and associated factors among hospital visitors in South Gondar Zone Hospitals. We found that 69.3% of the study participates had good knowledge, 62.6% of them had a positive attitude and less than half (49.3%) of had good preventive practice towards the prevention of COVID-19.

The finding of this study revealed that 69.3% (CI; 65.1–73.8) of the participants had good knowledge on COVID-19 prevention which was in line with the study conducted in India (70.0%) [32]. On the other hand, this study finding was lower than a multicenter study conducted among health care workers in Ethiopia with 88.2% [15] and Nigerian residents in an urban setting (99.7%) [36]. This deviation may be due to variations in socio-demographic characteristics of the study population and sources of information towards COVID-19.

In this finding, about 81.67% of the knowledge questions were correctly replied to by the respondents. This finding was in line with the study conducted in Saudi Arabia (80.5%) (4) and in Nigeria (77.36) [33]. The finding of this study was lower than the study conducted in China (90%) [34]. This discrepancy may be due to variation in the study population's characteristics, government commitment, and health care system. On the contrary, this study result was higher than in the Egyptian population (71.26%) [35]. This discrepancy might be due to the variation in socio-demographic characteristics of the population.

This study also revealed that about 80% of participants knew that the elderly, those who had chronic medical illnesses, and obese are more likely to develop severe cases of COVID-19. This finding was slightly higher than the study conducted in Ethiopia (72.5%) [11]. This variation may be due to the change in the study period, socio-demographic characteristics of the study population, and coverage of awareness creation towards COVID-19 prevention. Even though children and young adults are vulnerable groups, only 83.4% of the participants knew that these groups need to take preventive measures towards COVID-19. Neglecting such types of population may wide-spreading the transmission of the pandemic [11].

Regarding the attitudes, 62.6% (95% CI; 57.2–67.6) of respondents had a positive attitude towards COVID-19 prevention which was lower than the study conducted in Ethiopia (94.7%) [15], Nigeria 79.5% [36], and Pakistan (82.16%) [37]. This discrepancy may be due to a change in the socio-demographic characteristics of the study population, government commitment towards COVID-19. On the other hand, less than half (44.6%) of the participants believed that the government of Ethiopia can control the spread of COVID-19 within a short time. This finding was lower than the study conducted in China 97.1% [23] and India 87.2% [38]. This deviation may be due to the variation in the quality of the health care system, socio-demographic characteristics of the study population, and government preparedness towards the control of the COVID-19 pandemic.

Table 7. Factors associated with preventive practice towards COVID-19 prevention among adult visitors in hospitals of South Gondar zone, Northwest Ethiopia, in August 1 to 30, 2020.

Variable	Preventive practice status		COR (95% CI)	AOR (95% CI)	P-value
	Good	Poor			
Age (years)					
<20	9	15	1	1	
20–29	48	44	1.82(0.72–4.57)	0.87(0.24–3.38)	0.842
30–39	49	62	1.32(0.53–3.26)	0.43(0.12–1.67)	0.221
40–49	41	53	1.29(0.51–3.24)	0.75(0.20–2.56)	0.671
50–59	27	21	2.14(0.79–5.85)	0.99(0.23–4.24)	0.982
≥60	25	10	4.17(1.38–12.58)	1.31(0.28–6.11)	0.731
Education					
Cannot read and write	17	49	1	1	
Read and write	25	70	1.03(0.50–2.11)	0.93(0.36–2.43)	0.881
Primary (1–8 grade)	16	20	2.31(0.98–5.44)	0.39(0.08–1.80)	0.231
Secondary (9–12 grade)	17	12	4.08(1.62–10.27)	0.82(0.16–4.19)	0.821
College and above	124	54	6.62(3.50–12.52)	1.90(0.67–5.17)	0.212
Occupation					
Farmer	6	62	1	1	
Student	24	21	11.81(4.25–32.83)	7.70(1.15–15.86)	0.042
Currently unemployed	20	35	5.91(2.17–16.08)	2.35(0.58–9.57)	0.234
Government worker	93	36	26.70(10.62–67.12)	2.49(0.42–14.61)	0.316
Private business	56	51	11.35(4.52–28.47)	2.15(0.45–10.2)	0.348
Resident					
Urban	166	121	3.49(2.19–5.56)	1.54(0.79–3.00)	0.217
Rural	33	84	1	1	
Monthly income ($, USD)					
<13.82	39	88	1	1	
13.82–55.26	50	51	2.21(1.29–3.81)	2.05(0.71–5.93)	0.196
>55.26	110	66	3.76(2.32–6.12)	1.99(0.62–6.39)	0.253
Obtained training on COVID-19					
Yes	86	51	2.30(1.51–3.51)	0.88(0.47–1.64)	0.684
No	113	154	1	1	
Use social media					
Yes	160	92	5.04(3.23–7.87)	1.54(0.76–3.10)	0.231
No	39	113	1	1	
Use of peer as a source of information about COVID19					
Yes	184	161	3.35(1.80–6.25)	0.78(0.31–1.97)	0.613
No	15	44	1	1	
Use of Tv/radio as source of information about COVID-19					
Yes	185	136	6.70(3.62–12.41)	1.45(0.53–3.96)	0.462
No	14	69	1	1	
Knowledge					
Poor knowledge	22	102	1	1	
Good knowledge	177	103	7.97(4.73–13.41)	4.49(2.41–8.39)	<0.001
attitude					
Negative attitude	44	107	1	1	
Positive attitude	155	98	3.85(2.50–5.93)	1.04(0.58–1.86)	0.068

1, reference category

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According to the WHO report, the government of Ethiopia scored 52% towards the COVID-19 preparedness response [39] which supports the finding of this study. Furthermore, this study also indicated that almost two-thirds of the respondents believed that the pandemic of COVID-19 leads to the development of social stigma which was lower than a study conducted in Ethiopia at 77% [15] and 83.8% [11]. This deviation may be due to differences in socio-demographic characteristics of the study population and study period. On the contrary, this study finding was higher than the study conducted in the Peruvian population 59.1% [40]. This variation may be due to a change in the socio-demographic characteristics of the study population, study period, awareness creation towards COVID-19, and the burden of the pandemic. The social stigma may be developed due to fear of its mortality and high communicability. The history of social stigma due to pandemics was not a new phenomenon [41, 42].

Regarding the prevention practice of COVID-19, the overall practice score of the respondents was 73.2% which was higher than the study conducted in Ethiopia [25]. The finding of this study revealed that only half of the respondents 49.3% had a positive preventive practice of COVID-19. The finding of this study was lower than other studies conducted in Ethiopia [15, 25] and China [43]. This variation may be due to the change in the study setting, socio-demographic characteristics of the study population, and occupation of the study participant (being a health professional vs. general population), and the commitment of the government towards the prevention of COVID-19. Furthermore, most of the participants 93.6% washed their hands with water and soap for at least 20 seconds which was in line with a study conducted in Nigeria 96.4% [36]. On the contrary, this finding was lower than a study conducted in Nigeria 87.9% [32]. This deviation may be to a change in access and utilization of handwashing facilities in health care facilities.

Furthermore, 83.7% of the participants used face masks for the prevention of COVID-19 which were consistent with the study conducted in Nigeria 84.4% [32], and 82.3% [36]. This finding also revealed that less than half (43.8%) of the respondents applied the recommended physical distance of 2 meters when they go to public crowded areas. This finding was lower than the study conducted in Nigeria 83% [32] and 92.7% [36]. This variation may be due to a change in the socio-demographic characteristic of the study population, the burden of the disease, awareness of the community towards the COVID-19 pandemic, and population way of life.

The finding also revealed that more than two-thirds 70% of the respondents avoid going to crowded places after the emergence of COVID-19 which was higher than the finding in Nigeria 58.9% [32]. in addition to this, 82.4% of the respondents practiced respiratory hygiene which was lower than the finding in India (97.7%) [44]. The variation might be due to a change in a study setting, heterogeneity of population perception of the community, knowledge towards COVID-19, and burden of confirmed COVID-19 cases. Above all, the most common problem which was not applied by the participants was staying at home and only less than one-third (30%) after the occurrence of COVID-19. The possible justification for this might be due to the uncontrolled of the pandemic for a long period of time, poor preparedness of the community towards the pandemic, and subsistence way of life of the community.

Conclusion

Generally, knowledge, attitude, and practice towards the prevention of COVID-19 was low. Factors significantly associated with good knowledge on COVID-19 were educational status who can read and write and college and above and use of social media. Factors significantly associated with a positive attitude towards COVID-19 include presence of chronic illnesses, training on COVID-19, and peer/family as a source of information. Being a student and

participants who had a good knowledge on COVID-19 were factors significantly associated with good practice towards COVID-19. Hence, intervention strategies that could improve the knowledge, attitude, and practice status towards COVID-19 preventions are urgently needed to control the transmission of COVID-19. Health education for improving the status of knowledge, attitude, and preventive practice towards COVID-19 should be a priority agenda for hospitals, and health bureau administrators and other concerned stakeholders. Furthermore, providing training about COVID-19 prevention methods and using various sources of information about COVID-19 will help for improving positive attitude towards COVID-19 prevention, whereas for increasing the status of good preventive practices towards COVID-19, improving the good knowledge of adult hospital visitors are essential. Therefore, hospital administrators should work in collaboration with other concerned stakeholders to enhance the knowledge, attitude, and practice of hospital visitors towards COVID-19 prevention.

Supporting information

S1 Data.
(DOCX)

S2 Data.
(DOCX)

S3 Data.
(XLSX)

Acknowledgments

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