Knowledge, attitude, practice and psychological response toward COVID-19 among nurses during the COVID-19 outbreak in northern Ethiopia, 2020

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Abstract

Coronavirus disease 2019 (COVID-19) is not only a deadly disease outbreak but also affects the mental status of the population, including nurses. Nurses play a vital role in dealing with individuals with COVID-19. Nurses' infection control measures are affected by their knowledge, attitude, practice and psychological responses towards COVID-19. This study aimed to determine the knowledge, attitude, practice and psychological response among nurses toward the COVID-19 outbreak in northern Ethiopia. A hospital-based cross-sectional study design was employed. The data were collected from March to April 2020. Data were collected through a self-administered questionnaire.

The data were entered into Epi-data manager version 4.2 and exported to SPSS v.23 for analysis. Descriptive analysis was reported to describe the demographic, mean knowledge, attitude practice and psychological response score of nurses. A total of 415 nurses participated in this study, resulting in a 100% response rate. Of the participants, 241 (58.1%) were female. Of the 415 nurses, 307 (74%), 278 (67%), 299 (72%) and 354 (85.3%) had good knowledge, good infection prevention practice, a favourable attitude and disturbed psychological response towards COVID-19, respectively.

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Introduction

WHO declared that the coronavirus disease 2019 (COVID-19) outbreak was a public health emergency in December 2019 [1]. COVID-19 is an infectious respiratory illness caused by a novel coronavirus first identified in Wuhan, China, in December 2019. Coronaviruses are a large class of viruses that have been relatively widespread worldwide. The Chinese authorities in Wuhan City, the capital of the province of Hubei, China, first announced this at the end of December 2019 [2–4]. This virus has low pathogenicity and high transmissibility capability [5]. According to the WHO, the outbreak of COVID-19 is a pandemic that has infected more than 3 million people at the time of writing this research paper and caused more than 200 000 deaths 38 million cases and deaths are currently >1 million.–> worldwide [6]. In Africa, morbidity and mortality have reached >30 000 and 1200, respectively. Of those, 122 morbidities and three deaths were in Ethiopia [6].

Transmission of microbes among nurses is affected by hand disinfection, mask wearing, overcrowding, lack of single rooms for isolation, and is enhanced by the fact that some nurses have inadequate awareness of infection control practices [7]. Knowledge of disease can influence nurses' attitudes and practices, and disturbed psychological responses and incorrect attitudes and practices directly increase the risk of infection [8]. Extensive media coverage of the epidemic can now influence the public's physical and psychological response to the

infectious disease threat, which inevitably amplifies apprehension while serving as a pivotal tool to encourage precautionary and preventive measures [9].

Understanding nurses' knowledge, attitudes and practices, and psychological response, helps to predict the outcomes of planned behaviour. This study aimed to investigate knowledge, attitudes and practices, and psychological response towards COVID-19 among nurses. If nurses' knowledge, attitudes and practices concerning the virus and the factors that affect their attitudes and behaviors can be determined promptly in the early stages of the epidemic, then this information could be used to inform relevant training and policies during the outbreak and guide nurses in prioritizing protection and avoiding occupational exposure.

Methods

Study setting and period

A hospital-based cross-sectional study design was used at governmental public hospitals in northern Ethiopia. The study was conducted at Aksum St Mary General Hospital and Aksum Comprehensive Specialized Hospital. The study period was from March to April 2020. The source population was all nurses who were working in the study area, and the study population was all selected nurses from the selected health facilities.

Eligibility criteria

Inclusion criterion was all nurses. The exclusion criteria were nurses who did not present during the study (because of sick leave or annual leave).

Sample size and sampling technique

A single population proportion formula was used, and the following assumptions were made: 56.5% of nurses had good knowledge regarding COVID-19 from previous studies conducted in Iran [10], and 5% marginal error (*d*) with 95% confidence was employed as a parameter. By assuming a 10% non-response rate, the final sample size was 415 nurses. A simple random sampling technique was used to select the study participants. The sample size was proportionally allocated to each public health facility.

Data collection tools and procedures

A self-administered structured questionnaire was used to collect the knowledge, attitude and practice, and psychological response towards the COVID-19 outbreak. The questionnaire was adopted from other published articles [10−16], and further modification was carried out to fit the local context and

research objective. Two nurses with BScs were recruited for data collection, and one with an MSc was recruited as a supervisor. Overall, the data collection process was coordinated and supervised by the principal investigator.

Study variables

Dependent variables were knowledge, attitude, practice and psychological response. Independent variables were socio-demographic and personal factors.

Operational definitions

Knowledge of COVID-19. The total knowledge score for the nurses varied between 0 (with no correct answer) and 18 (for all correct answers); a cut-off level of ≤9 was evaluated as poor knowledge and >9 indicated good knowledge [13−17].

Attitude towards COVID-19. The question regarding attitude was no. 11 (with a minimum score of 11 and a maximum score of 55). The attitude score was based on a five-point Likert scale, in which a score of 1 to 5 was given from strongly disagree to strongly agree. A mean score >33 (answering for strongly agree or agree) was described as a favourable attitude, and a score of 11 to 33 indicated an unfavourable attitude (answering strongly disagree, disagree or neutral) [11,13,15,16].

Practice to prevent COVID-19. Question 14 concerned practice (with minimum score 14 and maximum score 70). The score of the practice was based on a five-point scale, in which a score of 1 to 5 was given from never to always. A mean score >42 (answering for always or most of the time or sometimes) was carried out as having good practice, and a score of ≤42 indicated poor practice (answering never or occasionally) [13,15,16].

Psychological response to COVID-19. Question 9 was about the psychological response (with minimum score 9 and maximum score 36). The psychological response score was based on a four-point scale, in which a score of 1 to 4 was given from not disturbed at all to almost daily disturbance. A mean score >18 (answering for almost daily disturbance or disturbed for more than 7 days) was described as having psychological disturbance, and a score of ≤18 indicated having no psychological disturbance (answering not disturbed at all or only a few days of disturbance) [16].

Data quality control

Data collectors were trained about the aim of the study and methods of data collection. The English version of the questionnaire was prepared. The supervisor and principal investigator performed continuous follow up and supervision for completeness and consistency of the data.

Data processing and analysis

The collected data were checked for completeness manually and then entered into EPI-DATA MANAGER version 4.2.1 and analysed using the SPSS version 23 statistical software package. Descriptive statistics including proportion, percentage, ratios, frequency distribution, the mean and standard deviation were used to describe the normally distributed data, whereas for the skewed data, the median and interquartile range were used.

Results

Sociodemographic characteristics

In all, 415 nurses fulfilled the inclusion criteria and were included in this study. More than half (241; 58.1%) were women. The median age of the participants was 30 years (±3 interquartile range). Out of the total nurses, 334 (80.5%) were orthodox Christians and the others were Muslims. Regarding participants' marital status, 335 (80.7%) were married. Of the participants, 380 (91.6%) and 35 (8.4%) were Tigrian and Amharan, respectively, in their ethnicity. Finally, 241 (58.1%) of the participants had more than 5 years of work experience (Table 1).

Nurses' knowledge of COVID-19

Nurses' knowledge of COVID-19 was measured using 18 questions and providing a numerical value for each question—1, Yes (correct); 0, No (incorrect answer) (Table 2).

Practice toward COVID-19

The infection prevention practices towards COVID-19 were measured by 14 questions using five criteria and by proving numerical value (1, never; 2, occasionally; 3, sometimes; 4, most of the time; 5, always) (Table 3).

Nurses' attitudes and psychological responses toward COVID-19

The nurses' attitude towards the COVID-19 was measured using 11 questions, each using five criteria and by proving

TABLE 1. Socio-demographic characteristics among nurses at Tigray teaching hospitals, Ethiopia, 2020 (n = 415)

Variables	Category	Number	%
Sex	Male	174	41.9
	Female	241	58.1
Marital status	Married	335	80.7
	Single	80	19.3
Religion	Christian orthodox	334	80.5
	Muslim	81	19.5
Ethnicity	Tigray	380	91.6
	Amhara	35	8.4
Work experience	<5 years	174	41.9
	≥5 years	241	58.1

numerical value (1, strongly disagree; 2, disagree; 3, neutral; 4, agree and 5, strongly agree) (Table 3).

The psychological response towards COVID-19 was measured using nine questions using four criteria and by proving numerical value (1, not disturbed at all; 2, a few days of disturbance; 3, disturbed for >7 days; 4, almost daily disturbance) (Table 4).

Discussion

This study attempted to assess the knowledge, attitude, practice, and psychological response toward COVID-19 outbreaks among nurses. Sociodemographic characteristics, knowledge level, attitude, infection prevention practical level, and psychological responses of 415 nurses were analysed.

TABLE 2. Knowledge of coronavirus disease 2019 (COVID-19) in nurses during the COVID-19 outbreaks in northern Ethiopia, 2020

Questions	Response	n (%)
COVID-19 is a virus infection	Yes	388 (93.5)
	No	27 (6.5)
COVID-19 vaccine is available in markets	Yes	210 (50.6)
	No	205 (49.4)
Antibiotics are the first-line treatment	Yes	218 (52.5)
	No	197 (47.5)
Washing hands with soap and water, and using face masks can help in the prevention of disease transmission	Yes	319 (76.9)
	No	96 (23.1)
Health-care workers are at a higher risk of infection	Yes	315 (75.9)
	No	100 (24.1)
COVID-19 could be fatal	Yes	300 (72.3)
	No	115 (27.7)
The main clinical symptoms of COVID-19 are fever, cough, sore throats and shortness breath and myalgia/ fatigue	Yes	374 (90.1)
	No	41 (9.9)
Unlike the common cold, stuffy nose, runny nose and sneezing are less common in persons infected with the COVID-19 virus	Yes	308 (74.2)
	No	107 (25.8)
There currently is no effective cure for COVID-2019, but early symptomatic and supportive treatment can help most patients recover from the infection	Yes	208 (50.1)
	No	207 (49.9)
Elderly patients and patients with underlying chronic diseases are at a higher risk of severe infection and death	Yes	308 (74.2)
	No	107 (25.8)
Eating or contacting wild animals would result in the infection by the COVID-19 virus	Yes	225 (54.2)
	No	190 (45.8)
Persons with COVID-2019 cannot infect the virus to others when a fever is not present	Yes	201 (48.4)
	No	214 (51.6)
COVID-19 is transmitted by close contact and via respiratory droplets with the infected person	Yes	316 (76.2)
	No	99 (23.8)
Ordinary residents can wear general medical masks to prevent the infection by the COVID-19 virus	Yes	204 (49.2)
	No	211 (50.8)
Children and young adults don't need to take measures to prevent the infection by the COVID-19 virus	Yes	215 (51.8)
	No	200 (48.2)
To prevent the infection by COVID-19, individuals should avoid going to crowded places such as train stations and avoid taking public transportations	Yes	205 (49.)
	No	210 (50.6)
Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus	Yes	198 (47.7)
	No	217 (52.3)
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	210 (50.6)
	No	205 (49.4)
Knowledge (mean knowledge 9.9 ± 4.6 SD; range 1−16)	Good	307 (74)
	Poor	108 (26)

TABLE 3. Infection prevention practice of nurses toward coronavirus disease 2019 (COVID-19) during the COVID-19 outbreaks in northern Ethiopia, 2020

Questions	Never frequency (%)	Occasionally Frequency (%)	Sometimes frequency (%)	Most of the time frequency (%)	Always frequency (%)
Have you gone to any crowded place?	40 (9.6)	55 (13.3)	240 (57.8)	20 (4.8)	60 (14.5)
Have you worn a mask when leaving home?	325 (78.3)	14 (3.4)	25 (6)	26 (6.3)	25 (6)
Do you always remove protective equipment carefully?	11 (2.6)	87 (20.9)	46 (11.1)	86 (20.7)	185 (44.6)
Do you cover mouth when coughing and sneezing in the past 14 days?	15 (3.6)	77 (21)	51 (12.3)	87 (21).	185 (44.6)
Do you avoid public transportation in the past 14 days?	77 (21)	182 (43.9)	86 (20.7)	55 (13.3).	15 (3.6)
Do you wash hands with soap and water in the past 14 days?	21 (5.1)	71 (17.1)	42 (10.1)	83 (20).	198 (7.7)
Do you wash hands immediately after coughing, rubbing the nose, or sneezing in the past 14 days?	177 (42.6)	87 (20.9)	82 (19.7)	55 (13.3).	14 (3.4)
Do you wear a mask regardless of the presence or absence of symptoms in the past 14 days?	41 (9.9)	97 (23.4)	52 (12.5)	182 (43.9).	43 (10.4)
Do you wash hands after touching contaminated objects in the past 14 days?	11 (2.6)	42 (10.1)	86 (20.7)	84 (20.2).	192 (46.3)
Do you avoid using the elevator in the past 14 days?	0	0	0	0	415 (100)
Do you sit in one row while having a meal in the past 14 days?	40 (9.6)	50 (12)	245 (59)	18 (4.3)	62 (14.9)
Do you avoid meeting with more than ten people in the past 14 days?	21 (5.1)	87 (21)	42 (10.1)	83 (20).	182 (43.9)
Do you feel that too much worry or anxiety has been made about COVID-19?	11 (2.6)	87 (20.9)	46 (11.1)	86 (20.7)	185 (44.6)
Do you stay at home to avoid COVID-19 rather than a normal situation (family quarantine)?	21 (5.1)	87 (21)	42 (10.1)	83 (20).	182 (43.9)
Practice (mean 42.9 ± 12.5 SD, range 17−68)	Good	278 (67)			
	Poor	137 (33)			

TABLE 4. Attitude and psychological response of nurses toward coronavirus disease 2019 (COVID-19) during the COVID-19 outbreaks in northern Ethiopia, 2020

Questions regarding attitude	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Do you agree that COVID-19 will finally be successfully controlled?	15 (3.6)	68 (16.4)	62 (14.9)	169 (40.7)	101 (24.3)
Do you have confidence that Ethiopia can win the battle against the COVID-19 virus?	20 (4.8)	67 (16.1)	60 (14.5)	168 (40.5)	100 (24.1)
You think you will probably get the illness	25 (4.8)	66 (16.1)	59 (14.5)	167 (40.5)	98 (24.1)
You are worried one of your family members may get an infection	21 (5)	60 (14.5	63 (15.2)	169 (40.7)	102 (24.5)
If getting COVID-19, you will accept isolation in health facilities	9 (2.2)	60 (14.5)	60 (14.5)	178 (42.9)	108 (26)
Transmission of COVID-19 can be prevented by washing hands with soap frequently	15 (3.6)	68 (16.4)	62 (14.9)	169 (40.7)	101 (24.3)
Prevalence of COVID-19 can be reduced by the active participation of health-care workers in hospital infection control programmes	9 (2.2)	60 (14.5)	60 (14.5)	178 (42.9)	108 (26)
If a COVID-19 vaccine was available, I would have it	20 (4.8)	67 (16.1)	60 (14.5)	168 (40.5)	100 (24.1)
COVID-19 patients should be kept in isolation	25 (4.8)	66 (16.1)	59 (14.5)	167 (40.5)	98 (24.1)
Patients should disclose their exposure	8 (4.8)	60 (14.5)	68 (16.4)	173 (41.7)	106 (25.5)
Medical staff are ready to participate in anti-epidemic procedures in the community	21 (5)	60 (14.5	63 (15.2)	169 (40.7)	102 (24.5)
Attitude (mean 33.8 ± 11.6 SD, range 12−55) Favourable attitude 299 (72%) Unfavourable attitude 116 (28%)					

Questions regarding psychological response	Not disturbed	For a few days disturbance	Disturbed for more than 7 days	Almost daily disturbance
Seemed to have no interest or pleasure in doing work or leisure activities	30 (7.2)	181 (43.6)	182 (43.8)	22 (5.3)
I felt depressed and hopeless/ level of fear of COVID-19	25 (6)	184 (44.3)	183 (44.1)	23 (5.5)
I found it difficult to fall asleep or kept sleeping or slept too much suddenly	35 (8.4)	185 (44.6)	173 (41.7)	22 (5.3)
I felt tired or had little energy/ feelings of fatigue after the outbreak	40 (9.6)	171 (41.2)	178 (42.9)	26 (6.3)
I tended to have no appetite or overeat	54 (13)	168 (40.5)	175 (42.2)	18 (4.3)
I felt that I have no confidence / I felt like I am a failure and let myself or my family down/ Confidence in defeating the virus	67 (16.14)	164 (39.5)	172 (41.4)	12 (2.9)
It was difficult to concentrate on such things as reading newspapers or watching television	73 (17.6)	151 (36.4)	182 (43.8)	11 (2.6)
When someone was watching me, I felt like moving or talking slowly. On the contrary, I was more active than usual, too restless or impetuous	44 (10.6)	174 (41.9)	179 (43.1)	18 (4.3)
I thought that it is better to die or that I would harm myself anyway	61 (14.7)	161 (38.8)	172 (41.4)	21 (5.1)
Psychological response (mean 18.3 ± 5.1 SD, range 9−36) Disturbed 354 (85.3) Undisturbed 61 (14.7)				

Of the 415 nurses, 307 (74%), 278 (67%), 299 (72%) and 354 (85.3%) had good knowledge, good infection prevention practice, a favourable attitude and disturbing psychological response towards COVID-19, respectively.

In this study, 74% (with 95% CI 70%−78.1%) of the participants had good knowledge regarding the COVID-19 outbreaks. This is higher than with the study conducted in Iran [14,17] and Saudi Arabia [18]. This might be due to the time of the study and differences in the study populations.

Our study findings regarding the knowledge level of nurses towards COVID-19 are consistent with the study conducted in Pakistan [19].

Among the nurses, 67% (95% CI 62%−71.8%) had good infection prevention practices towards COVID-19.

Our findings showed that 72% (95% CI 67.8%–76.4%) of the study participants had favourable attitudes towards COVID-19. These findings are in line with the studies conducted in China and Iran [12,14] and Saudi Arabia [18].

In our study, 85.3% (95% CI 82.2%–88.7%) of the nurses had disturbed psychological responses towards COVID-19. This result is similar to the study conducted in Singapore on COVID-19 [20] and China on the first severe acute respiratory syndrome [13], and this study is lower than with a study conducted in Hong Kong on COVID-19 [21]. This might be due to the same characteristics of infection as this is respiratory distress disease.

Conclusions

Nearly three-quarters of nurses had good knowledge and favourable attitudes regarding COVID-19. More than two-thirds of the nurses had good infection prevention practices towards COVID-19. Nurses had an almost disturbed psychological response to COVID-19. The WHO and the Ministry of Health must provide more information for better control of this infectious disease.

Limitations

The data presented in this study are self-reported and partly dependent on the participants' honesty and recall ability; they may be subject to recall bias.

Ethics approval and consent to participate

Ethical clearance was obtained from the College of Health Sciences, Aksum University. Written consent was obtained from the respondents. Confidentiality was assured for all the information provided, and no personal identifiers were used on the questionnaire.

Conflicts of interest

The authors declare that they have no competing interests.

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Consent for publication

Not applicable.

Availability of data and materials

The data sets used and/or analyses during the current study are presented within the manuscript and available from the corresponding author on reasonable request.

Authors' contributions

DBT conceived and designed the initial study. All authors contributed to the conceptualization and design of the study. DBT, GTG and GTD drafted the initial manuscript. All authors contributed to the development of the selection criteria, the risk of a bias assessment strategy, and data extraction criteria. DBT is the guarantor of the review. All authors read, provided feedback on, and approved the final manuscript before submission.

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