

Research Article

Poor COVID-19 Preventive Practice among Healthcare Workers in Northwest Ethiopia, 2020

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Background. The novel coronavirus disease (COVID-19) pandemic outbreak affects the global social, economic, and political context and becomes a significant threat to healthcare providers who are among the exposed groups to acquire and transmit the disease while caring and treating patients. It is crucial to comply with prevention recommendations so as to stay safe and protected. Therefore, this study aimed to assess COVID-19 preventive practice and associated factors among healthcare workers in Northwest Ethiopia. **Methods.** An institution-based cross-sectional study was conducted among 630 healthcare workers in Northwest Ethiopia from March to April 2020. A multistage sampling technique was used to select study participants. A pretested and structured self-administered questionnaire was used to collect data. The data were entered using Epi Info 7 and analyzed using STATA 16 statistical software. Both bivariate and multivariable logistic regression analyses were employed to identify associated factors. Adjusted odds ratio (AOR) with 95% confidence interval was used to determine independent predictors of COVID-19 preventive practice. In multivariable analysis, a variable with a *P* value of less than 0.05 was considered as statically significant. **Result.** Among 630 healthcare workers participated in the study, the overall good preventive practice towards COVID-19 was found to be 38.73% (95% CI: 34.8, 42.5). Being a male healthcare provider (AOR = 1.48; 95% CI: 1.02, 2.10), having work experience of 6–10 years (AOR = 2.22; 95% CI: 1.23, 4.00), and having poor attitude towards COVID-19 (AOR = 2.22; 95% CI: 1.03, 2.22) were found to be significantly associated with poor COVID-19 preventive practice among healthcare workers. **Conclusion.** Overall compliance towards COVID-19 preventive practice among healthcare workers was found to be low. Multiple education and training platforms with focus on COVID-19 preventive measures and adequate personal protective equipment and supplies should be provided for healthcare providers.

1. Introduction

The novel coronavirus disease (COVID-19), defined as an illness caused by severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2), was first identified as an outbreak of respiratory illness cases and first confirmed in December 2019 in Wuhan, Hubei Province, China [1, 2]. Astonishingly, in the

first three months after COVID-19 emerged, a devastating number of new cases were reported across China and several countries around the world [3], and it was finally declared as a global pandemic by the World Health Organization (WHO) on March 2020 [4]. Evidence indicates that COVID-19 transmitted through respiratory droplets via contact routes such as the mouth, nose, and conjunctiva or eyes [5, 6].

According to the Worldometer report, the outbreak has been confirmed in over 21,628,638 individuals worldwide and resulted in more than 769,128 deaths as of August 16, 2020, of which 99% cases were found in mild condition. More than 213 countries reported laboratory-confirmed coronavirus cases. In Africa, 1,113,246 confirmed cases and 25,385 deaths were reported. Moreover, in Ethiopia, 28,894 confirmed cases and 509 deaths were reported [7].

Even though the outbreak is a global pandemic, it is important to note that the problem needs more attention in Africa because the African countries have limited healthcare system capacity to control the pandemic [8]. Measures to prevent transmission in healthcare settings are an immediate priority to slowdown the demand for specialized healthcare such as intensive care unit beds, safe guarding risk groups, protecting healthcare workers, and minimizing the export of the cases to other healthcare facilities and the wider community [9].

Healthcare workers (HCWs) are at a high risk of exposure to COVID-19 due to their direct contact with patients, so the triage of the patient with acute respiratory symptoms should be determined, the contact distance should be arranged to be at least 2 meters, and patients should wear face masks. During the care of these patients, the HCW should wear necessary personal protective equipment (PPE) and keep hand hygiene [10]. Thus, poor WASH (Water, Sanitation, and Hygiene) and infection prevention and control (IPC) lead to hospital-acquired infections and transmission of disease from health facilities to the community that will exacerbate the outbreak and spread of infections [6].

A Cochrane trusted evidence showed that long and constantly changing local guidelines, low level of support by the management, lack of enough space for isolation, lack of quality and adequate PPE, and fear of the patients being stigmatized if mask is worn are important impeding factors to follow the IPC guidelines by the healthcare workers [11].

Ultimately, HCWs play a pivotal role in averting acquired infections from hospitals via practicing effective and evidence-based infection prevention and control strategies [12]. However, despite limited data available on practice compliance of HCWs for other infectious diseases [13], no data are available on practice compliance of HCWs against the predefined COVID-19 preventive measures in the study area and the country at large. Therefore, the study will be the first of its kind in informing the healthcare taskforce about the status of HCWs in preventing COVID-19 and an immediate action will be taken. HCWs will take an alarming precaution to protect themselves, as well as the community as a whole.

2. Methods

2.1. Study Design and Setting. This institution-based cross-sectional study was conducted from March to April 2020 in Northwest Ethiopia, Central and South Gondar zones of the Amhara regional state, to explore the preventive practice of healthcare providers towards COVID-19. The administrative zones have an estimated population of 5, 137, 443, and

there are 18 public hospitals and 181 public health centers (North Gondar: 10 hospitals and 85 health centers; South Gondar: 8 hospital and 96 health centers).

2.2. Sampling Strategy. Sample size was calculated using the single population proportion formula by considering a 95% confidence interval (CI), 5% margin of error (d), proportion (P) 50%, and 1.5 of design effect. Considering 10% of nonresponse rate, the final sample was 634 HCWs. A multistage sampling technique was used to select participants. From the total 18 hospitals and 181 health centers, 5 hospitals and 20 health centers were selected using simple random sampling. Then, based on the number of HCWs in each facility, the total sample was proportionally allocated to each facility, and then, each study participant was selected from the list of HCWs in each respective facility using simple random sampling.

2.3. Data Collection. The self-reported questionnaire was developed through reviewing different literatures that included sociodemographic characteristics such as age, sex, ethnicity, religion, marital status, types of working facility and level of education, knowledge questions on the clinical presentations and transmission routes, attitude of HCWs, and preventive practice towards COVID-19 outbreak. A pretest was conducted among providers out of the study area. Training was provided on data collection, and necessary COVID-19 precautions were provided during data collection. Six BSc public health officers and two master of public health holders collected data and supervised data collection, respectively.

2.4. Measurements. The dependent variable is preventive practice towards COVID-19. Preventive practices of HCWs were measured by 5 practice-related questions (Table 1). A correct answer was assigned 1 point, and an incorrect/unknown answer was assigned 0 points. The total score ranged from 0 to 5, with a higher score based on the mean value (≥ 3.13) denoting a “good preventive practice” of COVID-19.

Attitudes towards COVID-19 were measured by six questions (Table 2) about the agreement on the final control and confidence in winning the battle against COVID-19. A correct answer was assigned 1 point, and an incorrect/unknown answer was assigned 0 points. The total attitude score ranged from 0 to 6, with a score above the mean value (≥ 4.02) denoting a “good attitude” towards COVID-19.

The COVID-19 knowledge of HCWs was assessed by using 15 questions (Table 2). A correct answer was assigned 1 point, and an incorrect/unknown answer was assigned 0 points. The total knowledge score ranged from 6 to 15, with a higher mean score (≥ 13.56) denoting a “good knowledge” of COVID-19.

2.5. Statistical Analysis. Data were entered into Epi Info 7 and analyzed using STATA 16. Descriptive statistics were used to describe participants’ sociodemographics and response of knowledge, attitude, and preventive practice

TABLE 1: Preventive practice of healthcare professions towards COVID-19.

Preventive practice questions	Response	
	Yes (%)	No (%)
In the past 4 weeks, had travel history out of my town	536 (85.08)	94 (14.92)
In the past 4 weeks, had been in any crowded place	273 (43.33)	357 (56.67)
In the past 4 weeks, had consistently used face mask in the working place	228 (36.19)	402 (63.81)
In the past 4 weeks, had shaken hands with friends/staff	404 (64.13)	226 (35.87)
In the past 4 weeks, had washed hands frequently with soap/used sanitizers	529 (83.97)	101 (16.03)

Note. Good preventive practice if the mean value ≥ 3.13 .

TABLE 2: Descriptive statistics of knowledge and attitude of HCWs towards COVID-19.

Knowledge questions	Response	
	Yes (%)	No (%)
Fever is one of the possible typical symptoms of COVID-19	610 (96.83)	20 (3.17)
Dry cough is the possible typical symptom of COVID-19	559 (88.73)	71 (11.27)
Fatigue is the possible typical symptom of COVID-19	467 (74.13)	163 (25.87)
Myalgia is the possible typical symptom of COVID-19 is	410 (65.08)	220 (34.92)
Hand washing and/or sanitizer use frequently can help to protect you from COVID-19	611 (96.98)	19 (3.02)
Covering the nose with hands during sneezing can help to protect you from COVID-19	545 (86.51)	85 (13.49)
Wearing a face mask can help to protect you from COVID-19	552 (87.62)	78 (12.38)
Keeping physical distance can help to protect you from COVID-19	569 (90.32)	61 (9.68)
Asymptomatic persons with COVID-19 can transmit the disease	611 (96.98)	19 (3.02)
The isolation period for a COVID-19 suspect case is 2 weeks	615 (97.62)	15 (2.38)
Risk of death from COVID-19 is higher among patients with an underlying chronic illness	574 (91.11)	56 (8.89)
Healthcare workers are at higher risk for COVID-19 infection	620 (98.41)	10 (1.59)
Covid-19 is transmitted via respiratory droplets	611 (97.98)	19 (3.02)
There are specific vaccines to prevent COVID-19 as of today	589 (93.49)	41 (6.51)
Antibiotics are effective in treating COVID-19	603 (95.71)	27 (4.29)
Overall having good knowledge	404 (64.13)	226 (35.87)
<i>Attitude questions</i>		
Believe that COVID-19 will finally be successfully controlled	437 (69.37)	193 (30.63)
Hand hygiene is important in controlling the spread COVID-19	603 (95.71)	27 (4.29)
Wearing masks is important in controlling the spread COVID-19	597 (94.76)	33 (5.24)
Think you may probably get infected with COVID-19	445 (70.63)	185 (29.37)
Had confidence that Ethiopia can win the battle against COVID-19	347 (55.08)	283 (44.92)
Think the government of Ethiopia is doing enough to prevent and control COVID-19 outbreak	105 (16.67)	525 (83.33)
Overall good attitude	445 (70.63)	185 (29.37)

Note. Good knowledge if the mean value ≥ 13.56 , and good attitude if the mean value ≥ 4.02 .

questions. Cronbach’s alpha coefficient of the knowledge questionnaire was checked. Age of the respondents, knowledge, attitude, and preventive practice data were reported as mean \pm SD. A binary logistic regression model was fitted to identify the associated factors. Then, variables with a *P* value less than 0.2 were fitted to multivariable analysis. The goodness of fit was checked by using the Hosmer–Lemeshow goodness of fit. Multivariate logistic regression analysis with the enter method was used to identify predictors of preventive practice of COVID-19. A *P* value less than 0.05 was considered as statistically significant.

3. Results

3.1. Sociodemographic Characteristics of Study Participants. A total of 630 HCWs participated in the study, with the response rate of 99.2%. Of these, 395 (62.7%) were male providers. The mean age of participants was 31.2 ± 7 years. More than one-third of the participants were working in the

health center. A highest proportion of respondents were found to be 20–30 years old (62.22%), have a bachelor’s degree (BSc) in their current level of education (56.35), were Orthodox Christian followers (92.38%), and have one to five years of work experience (51.11%) (Table 3).

3.2. Participants’ Knowledge and Attitude towards COVID-19. Almost all 621 (98.6%) ever heard about COVID-19 virus. The most common source of information was news from television and radio. About two-thirds (67.3%) of the respondents reported that they use social media (Facebook, Twitter, WhatsApp, YouTube, and Instagram) to obtain information about COVID-19 (Figure 1).

Table 2 presents the response of the respondent’s knowledge and attitude. HCWs were generally knowledgeable, and almost 64.1% of the participants had good knowledge on the cause, clinical symptoms, and prevention mechanisms. Moreover, 445 (70.63%) respondents had positive attitude towards COVID-19 (Table 2).

TABLE 3: Sociodemographic characteristics of HCWs in Northwest Ethiopia, 2020 ($n = 630$).

Variables	Number (N)	Percentage (%)
<i>Age of study participants</i>		
20–30	392	62.22
31–40	180	28.57
≥41	58	9.21
<i>Type of working health facility</i>		
Health center	210	33.33
Hospital	420	66.67
<i>Level of education</i>		
Diploma	116	18.41
BSc	355	56.35
MSc	53	8.41
Physician	106	16.83
<i>Profession</i>		
Nurse	245	38.90
Midwife	120	19.0
Physician	102	16.20
Laboratory technician	69	11.0
Pharmacist	41	6.50
Anesthetist	16	2.50
Health officer	29	4.60
Radiography	8	1.30
<i>Ethnicity</i>		
Amhara	574	91.11
Qimant	26	4.13
Oromo	17	2.70
Others	13	2.06
<i>Religion</i>		
Muslim	33	5.24
Orthodox Christian	582	92.38
Protestant	15	2.38
<i>Year of experience</i>		
1–5 years	322	51.11
6–10 years	174	27.62
≥11 years	134	21.27

3.3. *Preventive Practice towards COVID-19.* The overall COVID-19 preventive practice among HCWs found was to be 244 (38.7%) (95% CI; 34.8, 42.5%). In the previous 4 weeks, about 84% of the participants washed their hands frequently with soap/hand sanitizers before and after contacting patients and entering their home and 36.3% of healthcare providers were not using face mask in the working place (Table 1).

3.4. *Factors Associated with HCWs' COVID-19 Preventive Practice.* Both bivariate and multivariable logistic regression analyses were used to see the effect of those variables on preventive practice towards COVID-19. In bivariate logistic regression analysis, variables such as sex, age, level of education, years of working experience, and attitudes of HCWs were associated with COVID-19 preventive practice. After controlling for the effects of potentially confounding variables using multivariate logistic regression sex, years of working experience and attitude were found to be significantly associated with poor COVID-19 preventive practice.

In comparison with female, male HCWs had higher odds of having poor preventive practice (AOR = 1.48; 95% CI: 1.02, 2.10). The odds of having poor COVID-19 preventive practice was 2.22 times higher among HCWs with 6–10 years working experience (AOR = 2.22; 95% CI: 1.23, 4.00) as compared to 11 or more years of working experiences. Moreover, HCWs having poor attitude towards COVID-19 virus were 1.51 times more likely (AOR = 2.22; 95% CI: 1.03, 2.22) to have poor preventive practice as compared to those having good attitude (Table 4).

4. Discussion

HCWs are at significant risk of COVID-19 infection during patient care delivery [14]. As consistent application of prevention mechanisms, use of PPE can diminish the risk of infection for healthcare workers [11]. This study assessed HCWs' compliance with the recommendations of COVID-19 preventive practice in Northwest Ethiopia.

The finding of this study showed that the overall good COVID-19 preventive practice among HCPs was found to be 38.7% (95% CI: 34.8, 42.7). This finding was lower than that of a study conducted among HCWs in China (87%) [15], and Uganda (74%) [16]. The possible explanation for the disparity might be due to the difference in the economic status of the country, which increases the capacity and distribution of protective equipment of the healthcare system. Moreover, the compliance towards COVID-19 prevention recommendations among those HCWs could be due to differences in measurement, country context, and disease burden. In the Uganda study, all samples were taken from a single facility.

In this study, only 36.1% reported consistent use of face masks in the workplace which significantly facilitate the chance to acquire and transmit the disease. This could be because some HCPs may find it difficult to use masks and other equipment when it made patients feel isolated, frightened, or stigmatized and some HCWs even found masks uncomfortable to use [11]. Even though the WHO and other partners announced there will be a global shortage of PPE due to increased demand [17], there are suggestions that facemasks may be used intermittently or continuously for around eight hours [18]. Adverse effects of facemasks increase with more than eight hours of use [19]; however, in this study, the median duration of using a single face mask was found to be 6 days, which contradicts with evidence that pathogens may be present on the outer surface of around 10% masks and risks increase with prolonged mask use [20].

Moreover, 84% of HCPs had practiced frequent hand washing with soap and water or using sanitizer before and after contacting patients and entering their home. This could be a good practice in the context of a country with limited resources. However, in the recent 4 weeks prior to data collection, 43.3% providers reported that they had been in a crowded place as in churches, markets, and funeral ceremonies and 64.1% had shaken hands with staff, friends, or other people. This could be due to the influences from cultural and social intimacy in the community and being absent from such social and cultural events might cause misunderstanding and get stigma from the community.

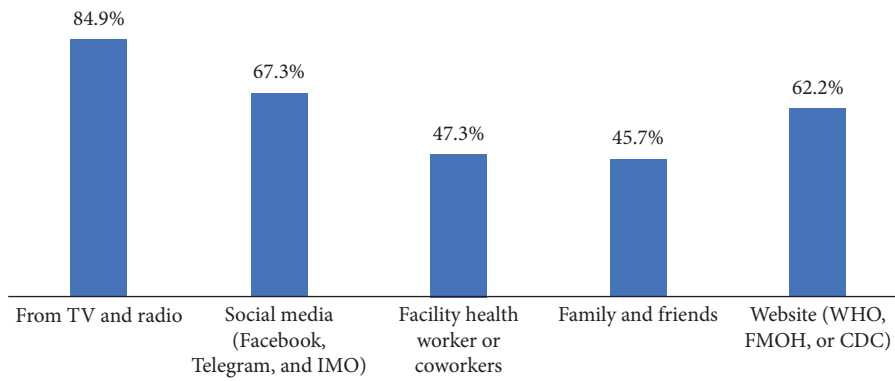


FIGURE 1: Source of information about COVID-19 virus.

TABLE 4: Bivariate and multivariate logistic regression analysis for factors associated with poor COVID-19 preventive practice among HCWs in Northwest Ethiopia, 2020.

Variables	Poor preventive practice		COR (95% CI)	AOR (95% CI)	P value
	Yes	No			
<i>Age</i>					
20–30	273 (43.33)	119 (18.89)	2.63 (1.51, 4.61)	1.46 (0.65, 3.28)	0.357
31–40	86 (13.65)	94 (14.92)	1.05 (0.58, 1.90)	0.72 (0.35, 1.45)	0.355
41	27 (4.29)	31 (4.92)	1.0		
<i>Sex</i>					
Female	133 (21.11)	102 (16.19)	1.0	1.0	
Male	253 (40.16)	142 (22.54)	1.37 (0.98, 1.90)	1.48 (1.02, 2.10)	0.031
<i>Level of education</i>					
Diploma	60 (9.5)	56 (8.9)	0.53 (0.31, 0.91)	0.68 (0.38, 1.28)	0.207
BSc	228 (36.2)	127 (20.2)	0.89 (0.56, 1.40)	1.05 (0.64, 1.72)	0.846
MSc	27 (4.3)	26 (4.1)	0.51 (0.26, 1.00)	0.85 (0.40, 1.80)	0.670
Physician	71 (11.3)	35 (5.6)	1.0	1.0	
<i>Year of working experience</i>					
1–5 years	218 (34.6)	104 (16.5)	3.16 (2.05, 4.71)	1.71 (0.90, 3.24)	0.102
6–10 years	114 (18.1)	60 (9.5)	2.82 (1.77, 4.48)	2.22 (1.23, 4.00)	0.008
≥11 years	54 (8.6)	80 (12.7)	1.0	1.0	
<i>Attitude</i>					
Poor	130 (20.6)	55 (8.7)	1.75 (1.21, 2.52)	1.51 (1.03, 2.22)	0.035
Good	256 (40.6)	189 (30.0)	1.0	1.0	

In this study, compliance towards COVID-19 prevention was significantly affected by sex. Female HCWs were found to better comply with prevention recommendations. This finding is consistent with that of a community-based study conducted among Chinese residents [21] that female participants implemented preventive practice than males. Moreover, in another study in Malaysia, females were found to better practice hand washing than males [22]. This could be due to the women’s responsibility in taking care of children and family in the Ethiopian culture, which may influence them to fear and comply with prevention recommendations.

HCPs having 6–10 years of experience had reported better compliance with COVID-19 prevention recommendations than providers with 11 or more years of experience. This finding is also supported by a study conducted among the Malaysian community [22] that those older people with the age of greater than 50 years were found to be less likely to wear facemasks. This could be because as the HCPs age and

experience increases, the exposure and fear for such outbreaks will reduce and may tend to normalize things as normal.

Attitude towards COVID-19 transmission, prevention, and control was among the factors that showed a significant association with compliance, and those providers who had poor attitude towards the disease, its transmission, and controlling movements were less likely to comply with the COVID-19 prevention recommendations. This finding was in line with studies conducted among communities in China [21] that those who were hopeful and confident that the disease will finally be controlled successfully were more likely to implement preventive practices.

5. Conclusions

Multiple education and training platforms with a focus on COVID-19 preventive measures need to be provided for HCPs. As a risk group for acquiring and transmitting the

diseases and the absence of any vaccine or treatment as of today, HCPs should comply with COVID-19 preventive measures and should rely on infection prevention and patient safety measures. A lack of or poor quality PPE is a serious concern for healthcare providers [11]. This would contribute to the reduced utilization of facemasks in the work place, which requires the need to avail the required protective supplies.

Abbreviations

AOR:	Adjusted odds ratio
CDC:	Centers for Disease Control and Prevention
COVID-19:	Coronavirus disease 2019
CI:	Confidence interval
COR:	Crude odds ratio
FMOH:	Federal Ministry of Health
HCW:	Healthcare worker
WHO:	World Health Organization.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Additional Points

As this area is not well studied, there was no any standard tool to investigate the HCPs' preventive practice. We developed the tool from different literature. We did not find adequate studies to compare and contrast, which makes our discussion shallow. Also, the findings of this study were based on HCPs' self-report. The self-report could be prone to social desirability and recall bias for preventive practice.

Ethical Approval

Ethical clearance was obtained from the Institutional Ethical Review Board of Debre Tabor University on 17 February 2020, Ref No. HSC/87/2012.

Consent

Informed consent was obtained from each healthcare provider after being informed all the purpose, benefits, risks, the confidentiality of the information, and the voluntary nature of participation in the study. Participants were informed that they have the right to discontinue at any point of the data collection.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

Authors' Contributions

BAK and AKB conceived the study. All teams were involved in proposal development and coordinated the data collection activity. Statistical analysis was carried out by EAK, AA, and BAK. The manuscript was developed by BAK, AKB, EAK,

and ASA. All authors critically reviewed, revised, and finally approved the manuscript.

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