Risk Management and Healthcare Policy

Dovepress
open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

Occupational Health Safety of Health Professionals and Associated Factors During COVID-19 Pandemics at North Showa Zone, Oromia Regional State, Ethiopia

This article was published in the following Dove Press journal:
Risk Management and Healthcare Policy

Dejene Hailu[1]
Mengistu Benayew[1]
Tiliksew Liknaw[1]
Muluken Ayenew[1]
Agumas Fentahun Ayalew[2]
Bizuneh Ayano[2]
Addis Adera[2]
Mengistu Tesema[2]
Andualem Gezahegn[3]
Tadesse Birhanu[4]
Eshetu Wendimu[5]

[1]Department of Nursing, College of Health Sciences, Salale University, Fitche, Ethiopia; [2]Department of Public Health, College of Health Sciences, Salale University, Fitche, Ethiopia; [3]Department of Midwifery, College of Health Science, Salale University, Fitche, Ethiopia; [4]Tropical and Infectious Disease, Salale University, Fitche, Ethiopia; [5]Research and Community Services Vice President, Salale University, Fitche, Ethiopia

Background: Coronavirus disease 19 was observed as a pandemic and caused many community health problems that resulted in Global issues. It causes death for many individuals including health professionals. This study aimed to determine the occupational health safety of health professionals and associated factors during COVID-19 pandemic at North Showa.

Methods: Institutions-based Cross-sectional study was conducted using a simple random sampling technique from May 10 to June 15, 2020. Interviewer-administered questioners were used, and data were entered into Epi-data version 3.1 and exported to SPSS 23 for analysis. Bi-variable logistic regression was carried out to select candidate variables with a cutoff point < 0.2. Finally, multivariable logistic regression was conducted to identify significant variables. An adjusted odds ratio with 95% CI at a 5% level of significance was used to measure the strength of association. P-value <0.05 indicated a significant association between variables.

Results: A total of 280 health professionals participated with a 92.72% response rate. Of which 57.9% (n=162) were males while 42.1% (n=118) females. Of total 48.9% (n=137) (95% CI: 43.2, 55.0) health professionals had poor occupational health and safety. Availability of soap and bleach (AOR=2.50; 1.439, 4.356), Possibility of isolate COVID-19 suspected clients (AOR=2.525; 1.690, 5.062), Availability of infections prevention and control program standards and policy (AOR=2.329; 1.325, 4.092), Availability of policy and procedure to prevent COVID-19 (AOR= 2.427; 1.389, 4.240) were significantly associated.

Conclusion: The result suggested that occupational health safety was generally low in the study area. Therefore, a preventive measure such as the use of personal protective equipment and adherence to hand hygiene practice and Infection prevention policy could reduce the spread of COVID-19 and further study should be conducted to generate more evidence on determinants of occupational health safety.

Keywords: occupational health, COVID-19, safety, Ethiopia

Introduction

Coronavirus had been observed as an epidemic disease since 2003 and it has also caused many community health problems that resulted in Global serious issues. Moreover, these cases consecutively occurred as severe acute respiratory syndrome (SARS), middle east respiratory syndrome (MERS), and Coronavirus diseases 2019 (COVID-19).[1]

Correspondence: Dejene Hailu
Email dejenehailu77@yahoo.com

submit your manuscript | www.dovepress.com
DovePress
http://doi.org/10.2147/RMHP.S292830

Public health disasters are threatening the world with the emergence and spread of 2019 novel coronavirus (2019-nCoV) or the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The virus originated in bats and was transmitted to humans through yet unknown intermediary animals in Wuhan, Hubei province, China in December 2019.[2]

According to the Worldometer report, the outbreak has been confirmed in over 8,708,008 cases (of which 183,020 new cases) worldwide and resulted in more than 461,715 deaths. In Africa, 216,999 confirmed cases, and 4874 deaths were reported. Moreover, in Ethiopia, 4469 total confirmed cases of which 399 confirmed new cases and 72 deaths were reported as of June 21, 2020, and that was at the community transmission stage.[3]

As the outbreak is a global pandemic, it is important to note that the problem needs more attention all over the world especially in Africa because African countries have limited healthcare structure to control the pandemic.[4] Prevention of transmission in healthcare settings is the priority to slow down the demand for particular healthcare setting such as intensive care unit beds, safeguarding risk groups, protecting healthcare workers, and minimizing the transfer of the cases to other healthcare facilities.[5] Healthcare professionals are at the front line of the COVID-19 due to their direct contact with patients during triage on acute respiratory symptoms, so they should keep the distance at least 2 meters, and patients should wear face masks. During the care of these patients, the healthcare workers (HCW) should wear necessary personal protective equipment (PPE) and adherence to hand hygiene practice.[6]

Thus, poor WASH (Water, Sanitation, and Hygiene) and infection prevention and control (IPC) lead to hospital-acquired infections and transmission of disease from health institutions to the community that worsens the outbreak and spread of infections.[7]

According to World Health Organization Ethiopia is identified as one of the 13 high-risk African countries for coronavirus. According to a statement issued on Friday, February 1, 2020, WHO said the identified African nations have direct links or a high volume of travel to China. WHO put Ethiopia 12th risk nation among these 13 countries.[8]

Ethiopia confirms the first coronavirus case on 13 March 2020 in the country and the victim was later identified as a Japanese citizen who comes from Burkina Faso, after 43 days of WHO put under risk African country and after 103 days China confirmed the case in its territory. Ethiopia has reported its first case of the brand new coronavirus; the rustic's public wellbeing institute informed Reuters Information Company. The mayor of the capital Addis Ababa reported that "Eastern citizen was once the individual affected".[9] After 2 days of confirmed first coronavirus case, March 15 2020, three additional cases of the coronavirus were reported.[10]

Occupational Health Safe Work Practices

Are types of administrative controls that include procedures for safe and proper work used to reduce the duration, frequency, or intensity of exposure to a hazard. Safe work practices for SARS-CoV-2 include providing resources and a work environment that promotes personal hygiene, requiring regular hand washing, or using alcohol-based hand rubs that are used to minimize the transmission of infection in the working environment.[11]

Coronavirus disease 19 is a leading cause for the death of many individuals worldwide and many health professionals in Italy including doctors. More than 100 physicians and nurses were died due to COVID-19 and half of this were from Italy. A report from CDC indicates the United States of America 19% of the total COVID-19 infected individuals were health professionals of which three-quarters were females. However, there is no evidence for the magnitude of COVID-19 infection in Ethiopia.[12]

In the beginning, the Ethiopian government and Ethiopian airlines do not take any measures even if the virus was widely spread among 134 countries. According to the Health Minister of Ethiopia, despite worsening situations in other countries, Ethiopia will not be enforcing a travel ban, although stating that the virus is in 134 countries.[12] But the contact tracing started after the first confirmed case in Ethiopia.[13] As soon as three additional confirmed cases the government of Ethiopia reacts as the following, on 16 March 2020, the office of the prime minister announced that schools, sporting events, and public gatherings shall be suspended for 15 days.[14] On 20 March 2020, Ethiopian Airlines stopped flights to 30 countries affected by the coronavirus and announced that anyone entering the country should undergo a mandatory self-quarantine for 14 days. Night clubs in Addis Ababa are also to remain closed.[14]

The study on OHS of health professionals was the key to the improvement of the safety of health professionals and clients at the health institution. Also, used to reduce the spread of COVID-19 infection and decrease other

work hazards; besides, health professionals must implement OHS at work and within the offices to make sure that their employees and clients are safe and healthy. Therefore, this study was aimed to assess the occupational health safety of health professionals and associated factors during COVID-19 epidemic in North Showa Zone, Oromia Regional State, Ethiopia.

Research Questions

- Do health professionals maintain their occupational health and safety during COVID-19 pandemics?
- What are the factors which affect the occupational health and safety of health professionals during COVID-19 Pandemics?

Methods

Study Setting

The study was conducted at all Public Hospitals in the North Shoa zone. North Shoa zone is one of the 20 zones found in the Oromia regional state. It has 24 districts and a total population of 1431,305.

The zone has 63 Health centers and 5 public hospitals. Seven hundred and fifteen health professionals were working in these hospitals.

Study Design and Period

Institutional based cross-sectional study was conducted from May 10-June 15, 2020 on public Hospitals among health professionals.

Source Population

All health professionals working at all public hospitals in the North Shoa zone during the data collection period.

Study Population

All randomly selected professionals recruited and working at all public hospitals in the North Shoa zone during the data collection period were the study population.

Inclusion and Exclusion Criteria

Health professionals working at public hospitals in the North Shoa zone during the data collection period and who were volunteers to participate in this study were included. Health professionals who were on annual leave and severely sick were excluded from the study.

Sample Size Determination and Sampling Procedure

Sample Size Determination

The sample size was calculated using single population proportion formula using a proportion of 50% since no study was not conducted earlier. Considering 95% confidence interval and 5% marginal error with a 20% non-response rate, the sample size used in this study was calculated using simple population proportion formula.

$$n_i = \left\{ \frac{[(z_{\alpha/2})^2 .(p(1-p)]}{d^2} \right\}$$

ni= initial sample size.

Z= standard normal value at 95% CI which is 1.96

P=proportion of occupational health safety which is 0.5 since no study was done previously.

d=possible margin of error tolerated which is 5%.

$$n = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2} = 385$$

Since the total population or the total number of health professionals in North Showa Zone hospitals 715 which is less than 10 thousand sample size correction formula considered.

nf=n/1+n/N = 385/1+385/715 =385/1+0.53846154=385/1.53846154 = 250.25=251.

By adding a 20% non-response rate the final smallest required sample size will be

= 251+251*20/100= 251+250.2=301.2= 302.

Sampling Procedure

The study was conducted in five Hospitals; Fitche hospital, Muke Turi hospital, Shano hospital, Kuyu hospital, and Gundo Meskel hospital which were located in the North Shoa zone. The number of study participants allocated proportionally to each Hospital based on the number of health professionals each hospital owns. Therefore, the sample of each Hospital was calculated by multiplying the number of health professionals all hospitals have with the total sample size (n=302), dividing by the total number of health professionals each hospital had. Based on their number of health professionals we involved, 71, 51, 68, 63, and 49 study participants from each hospital, respectively. The study participants were selected from each public Hospital by using a simple random sampling technique or lottery method (Figure 1).

Data Collection Tool and Procedure

Data were collected through interviewer-administered structured questionnaires. The data collection tools were

originally prepared by the authors of this manuscript, through adapting and modifying from various works of literature. The questionnaire is prepared in English and translated to Afan Oromo and translated back to the English version to check the consistency. Fifteen health professionals were selected for data collection and supervision, ten for data collection, and five health professionals for supervision. The study participants were selected from each public Hospital by using a simple random sampling technique (lottery method).

Data Quality Assurance

Two days of training were given to data collectors and supervisors on the objective of the study, contents of the questionnaire (original tool prepared by authors of this manuscript), confidentiality, the right of respondents, and how to collect data. The pretest was conducted on 5% of the sample at Degem Health Center and the Cronbachs alpha value was 0.78. To identify the reliability of the data collection instruments and findings, data collectors and supervisors were discussed on the questionnaire so that the tool was modified for any inconsistencies and ambiguity before actual data collection.

Study Variables

Dependent Variable

Occupational health safety

Independent Variables

Socio-economic variables: age, sex, educational level, religion, profession, monthly income, work experience, marital status, and ward

Availability of PPE and other disinfectants: accessibility of supplies; like Availability of PPE, water wash station, presence of IPCP policy and procedure towards COVID-19 prevention, staff training, screening, and monitoring, presence of staff infection, and prevention surveillance.

Engineering and administrative control: Restricting the number of staff entering the room, minimizing staff

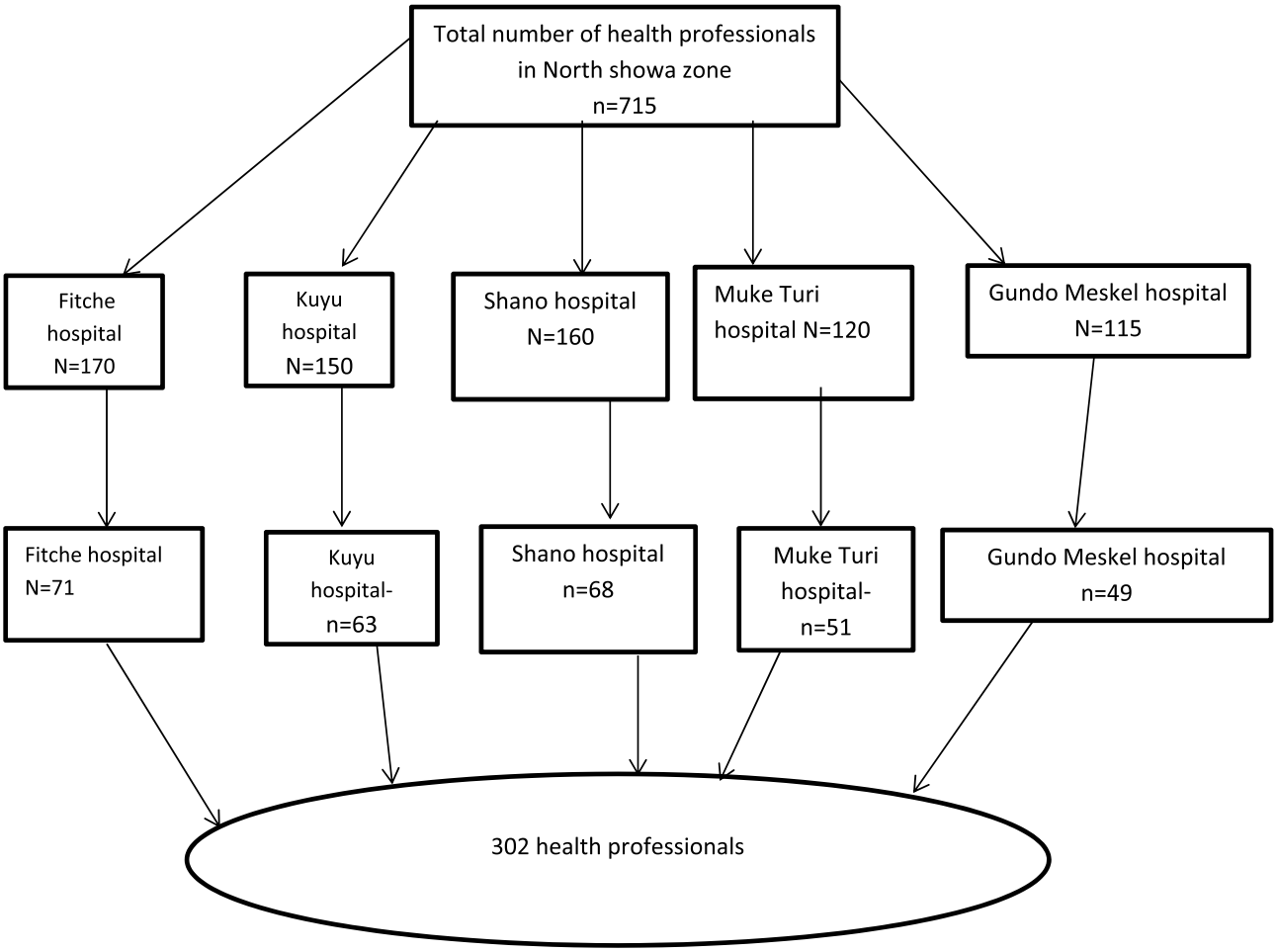

Figure 1 Schematic presentation of sampling procedure of a research project.

Table 1 Socio-Demographic Characteristic of Health Professionals at Hospitals in North Showa Zone, Oromia Regional State, Ethiopia, 2020

Variables	Category	Occupational Health and Safety			
		Unfavorable	Favorable	Total	X^2, p-value
		Frequency (%)	Frequency (%)	Frequency (%)	
Age	18–29	78 (56.9)	97 (67.8)	175 (62.5)	5.283, 0.152
	30–39	47 (34.3)	36 (25.2)	83 (29.6)	
	40–49	11 (8.0)	7 (4.9)	18 (6.4)	
	≥50	1 (0.7)	3 (2.1)	4 (1.4)	
Sex	Male	89 (54.9)	73 (45.1)	162 (57.9)	2.300, 0.129
	Female	54 (45.8)	64 (54.2)	118 (42.1)	
Religion	Orthodox	104 (75.9)	102 (71.3)	206 (73.6)	4.865, 0.301
	Muslim	13 (9.5)	12 (8.4)	25 (8.9)	
	Catholic	3 (2.2)	1 (0.7)	4 (1.4)	
	Protestant	13 (9.5)	25 (17.5)	38 (13.6)	
	Others	4 (2.9)	3 (2.1)	7 (2.5)	
Educational level	Diploma	47 (34.3)	41 (28.7)	88 (31.4)	1.031, 0.310
	Degree and above	90 (65.7)	102 (71.3)	192 (68.6)	
Work experience	<5	74 (54.0)	96 (67.6)	170 (60.9)	7.845, 0.020
	5–10	41 (29.9)	23 (16.2)	64 (29.2)	
	>10	22 (16.1)	23 (16.2)	45 (16.1)	
Monthly income	<5000	59 (43.1)	69 (48.3)	128 (45.7)	1.996, 0.369
	5000–9999	75 (54.7)	68 (47.6)	143 (51.1)	
	≥10,000	3 (2.2)	6 (4.2)	9 (3.2)	
Profession	Pharmacy	11 (8.0)	17 (11.9)	28 (10.0)	6.211, 0.184
	Nurse	66 (48.2)	76 (53.1)	142 (50.7)	
	Laboratory	22 (16.1)	11 (7.7)	33 (11.8)	
	Midwifery	23 (16.8)	20 (14.0)	43 (15.4)	
	MD and other Masters	15 (10.9)	19 (13.3)	34 (12.1)	
Ward	Medical	32 (23.4)	28 (19.6)	60 (21.4)	5.618,0.230
	Surgical	26 (19.0)	24 (16.8)	50 (17.9)	
	Pediatrics	12 (8.8)	17 (11.9)	29 (10.4)	
	Oby/gyn	25 (18.2)	16 (12.1)	41 (14.6)	
	OPD and NICU	42 (30.7)	58 (40.6)	100 (35.7)	
Marital status	Single	54 (39.4)	77 (53.8)	131 (46.8)	7.874, 0.049
	Divorced	8 (5.8)	4 (2.8)	12 (4.3)	
	Windowed	6 (4.4)	2 (1.4)	8 (2.9)	
	Married	69 (50.4)	60 (42.0)	129 (46.1)	
Family size	1	62 (45.3)	69 (48.3)	131 (46.8)	1.760, 0.415
	2	42 (30.7)	34 (23.8)	(76 (27.1)	
	≥3	33 (24.1)	40 (28.0)	73 (26.1)	

present in the room, the possibility of isolating suspected cases separately, and availability of engineering control to shield health care workers from clients.

Operational Definition

Occupational Health and Safety

According to WHO (1995), occupational safety and health can be defined as a multidisciplinary activity aiming at Protection

Table 2 Availability of Personnel Protective Equipment at Hospitals During COVID-19 Pandemics in North Showa Zone, Oromia Regional State, Ethiopia, 2020

Variables	Category	Occupational Health and Safety			
		Unfavorable	Favorable	Total	X^2, p-value
		Frequency (%)	Frequency (%)	Frequency (%)	
Do you have appropriate personnel protective equipment?	No Yes	69 (50.4) 68 (49.6)	44 (30.8) 99 (69.2)	113 (40.4) 167 (59.6)	11.162,0.001
Do you have a face mask to wear during serving the client?	No Yes	40 (29.2) 97 (70.8)	26 (18.2) 117 (81.8)	66 (23.6) 214 (76.4)	4.712, 0.030
Do you have enough gloves in your room?	No Yes	80 (58.4) 57 (41.6)	55 (38.5) 88 (61.5)	135 (48.2) 145 (51.8)	11.134,0.001
Do you have eye/face protection (eg, goggles, face shield)	No Yes	94 (68.6) 43 (31.4)	76 (53.1) 67 (46.9)	170 (60.7) 110 (39.3)	7.017, 0.008
Do you have disinfectants around your working area?	No Yes	65 (47.4) 72 (52.6)	43 (30.1) 100 (69.9)	108 (38.6) 172 (61.4)	8.915, 0.003
Do you have antiseptics around your working area?	No Yes	68 (49.6) 69 (50.4)	33 (23.1) 110 (76.9)	101 (36.1) 179 (63.9)	21.401, <0.001
Do you have an accessible handwashing facility in your working room?	No Yes	67 (48.9) 70 (51.1)	37 (25.9) 106 (74.1)	104 (37.1) 176 (62.9)	15.896, <0.001
Do you have soap or bleach in your room?	No Yes	85 (62.0) 52 (38.0)	41 (28.7) 102 (71.3)	126 (45.0) 126 (55.0)	31.485, <0.001

and promotion of the health of workers by eliminating occupational factors and conditions hazardous to health and safety at work, Enhancement of physical, mental, and social well-being of workers and support for the development and maintenance of their working capacity, as well as professional and social development at work, Development and promotion of sustainable work environments and work organizations.

In this study, participant's OHS issues were assessed with 19 questions each weighs equal value. The maximum score for each participant was 19 and the minimum score will be 0 points. At last, the scores of each question were categorized into two levels of OHS:

- Favorable OHS: a score of above the mean
- Unfavorable OHS: a score of mean and below OHS

Data Processing and Analysis

After data collection, data were checked for completeness and coded, cleaned, and entered into EPI data, and transported to SPSS version 23 for data cleaning and analysis. Descriptive statistics such as tables and proportions were used to present the data. Bivariate and multivariate logistic regression analyses were done to see the association between dependent and independent variables.

Results

Socio-Demographic Characteristics of Respondents

A total of 280 study participants participated in the study with a 92.7% response rate. Of which 57.9% were males while 42.1% of study participants were females. The mean age of study participants was 29.60 ±5.86. Regards to the profession of study participants half of the study participants 50.7% were nurses (Table 1).

Availability of Personnel Protective Equipment

Regards to availability of personnel protective equipment from these hospitals during COVID-19 Pandemics, 48.2% of respondents lack gloves or they had a shortage of gloves, incase 45% of study participants had no soap or

Table 3 Engineering and Administrative Control of Hospitals During COVID-19 Pandemics in North Showa Zone, Oromia Regional State, Ethiopia, 2020

Variables	Category	Occupational Health and Safety			
		Unfavorable	Favorable	Total	X^2, *p*-value
		Frequency (%)	Frequency (%)	Frequency (%)	
Do you restrict the number of personnel entering the room of a patient?	No Yes	73 (47.1) 70 (56)	82 (52.9) 55 (44)	155 (55.4) 125 (44.6)	2.195, 0.138
Do you minimize the number of staff present when performing aerosol-generating procedures?	No Yes	77 (46.1) 66 (58.4)	90 (53.9) 47 (41.6)	167 (59.6) 113 (40.4)	4.080, 0 0.043
Is it possible isolating suspected cases separately to help prevent transmission	No Yes	40 (32) 103 (66.5)	85 (68) 52 (33.5)	125 (44.6) 155 (55.4)	32.867,<0.001
Is their engineering controls to shield healthcare workers from patients, especially at triage areas	No Yes	65 (39.4) 78 (67.8)	100 (60.6) 37 (32.2)	165 (58.9) 115 (41.1)	21.923,<0.001
Is there infection prevention and control program standards and policies in your organization?	No Yes	34 (32.4) 109 (62.3)	71 (67.6) 66 (37.7)	105 (37.5) 175 (62.5)	23.486,<0.001
Does your organization have a policy and procedure for COVID-19 prevention?	No Yes	37 (32.7) 106 (63.5)	76 (67.3) 61 (36.5)	113 (40.4) 167 (59.6)	25.469,<0.001
Does the facility's policy include notifying if there are clusters of respiratory illness of COVID	Yes No	40 (35.1) 103 (62)	74 (64.9) 63 (38)	114 (40.7) 166 (59.3)	19.659,<0.001

bleach in their room. Contemporarily, 76.4% of study participants respond as they had face mask to wear during serving the client (Table 2).

Engineering and administrative control

The majority of the participants 55.4% were not restricted the number of personnel entering into the patient's room. When we assess the number of staff present during the aerosol-generating procedure, 167 (59.6%) respondents respond as they had not minimized their staff. The largest proportion of the participants with a total number of 165 (58.9%) were not had engineering control (Table 3).

Occupational Health and Safety of Health Professionals During COVID-19 Pandemics

Occupational health and safety of health professionals are mandatory mainly at this time since there was a highly contagious COVID-19 pandemic worldwide, to save the life of health professionals and other individuals in the community. Here is 48.9% of health professionals had unfavorable occupational health and safety, whereas 51.1% had favorable occupational health and safety (Table 4).

Factors Associated with Occupational Health and Safety Among Health Professionals

The effects of different independent variables were tested for the presence of association with occupational health and safety of health professionals using bivariate logistic regression analysis. Variables having P-values < 0.2 in the bivariate logistic regression analysis were included in multivariable analysis.

At this step, sex of respondents, availability of appropriate PPE, availability of face masks, availability of enough gloves, availability of eye protection, availability of disinfectants around their working area, availability of antiseptics, availability of accessible handwashing facility in their room, availability of soap or bleach, restrict the number of personnel entering the room of a patient, minimizing the number of staff present when performing activities, isolating suspected

Table 4 Safe Working Practices of Health Professionals During COVID-19 Pandemics at Hospitals in North Showa Zone, Oromia Regional State, Ethiopia, 2020

Variables	Category		
	No	Yes	X^2, *p*-value
	Frequency (%)	Frequency (%)	
Do you wear gloves when you have contact with patients?	40 (14.3%)	240 (85.7%)	21.048, <0.001
Do you wear a proper face mask when you are serving the client?	91 (32.5%)	189 (67.5%)	13.651, <0.001
Do you clean and disinfect reusable instruments after each client?	66 (23.6%)	214 (76.4%)	37.382, <0.001
Do you wash your hand appropriately with water before wearing PPE?	89 (31.8%)	191 (68.2%)	57.183, <0.001
Do you perform hand hygiene before contact with the patient? (even if gloves are used)	81 (28.9%)	199 (71.1%)	64.107, <0.001
Do you perform hand hygiene after contact with the patient? (even if gloves are used)	81 (28.9%)	199 (71.1%)	77.399, <0.001
Do you perform hand hygiene after removing PPE (eg, gloves, gown, and facemask)?	72 (25.7%)	208 (74.3%)	80.355, <0.001
Do you use an alcohol-based hand rub after you serve each client?	76 (27.1%)	204 (72.9%)	60.005, <0.001
Do you change gloves when indicated and performed hand hygiene?	66 (23.6%)	214 (76.4%)	52.428, <0.001
Removed and discarded PPE after resident care and prior to leaving room appropriately	55 (19.6%)	225 (80.4%)	44.181, <0.001
Do you wash your hands before and after performing a procedure?	80 (28.6%)	200 (71.4%)	71.074, <0.001
Do you perform routine cleaning and disinfection procedures?	75 (26.8%)	205 (73.2%)	46.662, <0.001
Do you differentiate clean areas where PPE is put on from potentially contaminated areas where PPE is removed?	94 (33.6%)	186 (66.4%)	74.117, <0.001
Do you handle waste and other potentially infectious materials properly?	67 (23.9%)	213 (76.1%)	42.326, <0.001
Do you avoid touching your faces, eyes, noses, and mouth after you have thoroughly washed your hands upon completing work and/or removing PPE?	92 (32.9%)	188 (67.1%)	50.739, <0.001
Have you been tested for COVID-19?	172 (61.4%)	108 (38.6%)	0.205,0.651
Do you have taken any orientation, training or education on COVID-19	130 (46.4%)	150 (53.6%)	8.825, 0.003
Do you maintain social distance during the COVID-19 outbreak?	86 (30.7%)	194 (69.3%)	32.274, <0.001
Do you avoid crowded places like workshop places, bus, and train stations, bank	113 (40.4%)	167 (59.6%)	16.581, <0.001
Total occupational health and safety	Favorable	137 (48.9)	
	Unfavorable	143 (51.1)	

(*Continued*)

Table 4 (Continued).

cases separately, availability of engineering controls to shield healthcare workers from patients, availability of functional infection prevention and control program standards and policy, availability of policy and procedure for COVID-19 prevention, notify if there are clusters of respiratory illness or cases of COVID-19, knowledge and attitude of health professionals had a statistically significant association with occupational health and safety of health professionals at P<0.20.

Finally, multivariable logistic regression at a P-value less than 0.05 with the forward method was used to assess factors associated with occupational health and safety of health professionals, after checking the Hosmer-Lemeshow goodness of fit test (0.783)

Health professionals who had soap and bleach in his/her room were 2.5 times more likely to be occupational

health safe than those who had not soap and bleach (AOR=2.50, 95% CI: 1.439, 4.356).

Health professionals who can isolate the suspected COVID-19 clients were almost 3 times occupationally health safe than the counterpart (AOR=2.525, 95% CI: 1.690, 5.062).

When there were infections prevention and control program standards and policy in hospitals the occupational health safety of health professionals increased by 2.33 than those who had not IPC policy (AOR=2.329, 95% CI: 1.325, 4.092). Additionally, health professionals who had policies and procedures to prevent COVID-19 were 2.43 times to have had favorable occupational health and safety than the counterpart (AOR= 2.427, 95% CI: 1.389, 4.240) (Table 5).

Discussion

At this time when the world is with COVID-19 pandemics, scientific investigations on health professionals' occupational safety are necessary to take appropriate measures and to save their life from this fatal pandemic. Therefore, the study was conducted to assess occupational health safety of health professionals and associated factors during COVID-19 pandemic at North Showa Zone, Oromia Regional State, Ethiopia.

This study revealed that only half of study participants 51.1% (n=143) (95% CI: 45.0–56.8) of health professionals had favorable occupational health and safety, while 48.9% (n=137) (95% CI: 43.2, 55.0) health professionals had unfavorable occupational safety and health. This finding is slightly higher than the previous study conducted in Trabzon, Turkey.[15] This difference might be due to variations in the study setting, socio-cultural difference and there are some considerations to prevent COVID-19 infections of health professionals currently. Even if occupational safety of health professionals showed that improvement when compared with studies conducted before COVID – 19 pandemics, 48.9% unfavorable OHS might affect the life of health professionals, the health of the clients, and the outcome of health service at large. Therefore, the ministry of health, the government, and hospital administrations shall be given great attention to the OHS of health professionals.

In addition to assessing the level of OHS of health professionals, this study also predicts various predictors of OHS among health professionals. In this way, the Availability of soap and bleach, the possibility of isolating suspected cases separately, availability of infections prevention and control program standards and policy, and availability of policy and procedure to prevent COVID-19 had a statistically significant association with OHS in this study. Availability of soap and bleach and the possibility of isolating suspected cases separately were novel or new variables which were showed statistically significant association with OHS, On the other hand being a male healthcare provider, having work experience of and having a poor attitude towards COVID-19 were had statistically significant association on other studies but not on this study.[16]

This study revealed that lack of soap and bleach in health professionals' rooms can decrease health professionals' occupational safety and health (AOR=2.50, 95% CI: 1.439, 4.356). This could be described as shortages of soap and bleach in health professionals "rooms that could influence the handwashing practice of health professionals" before and after patient contact. Hand washing for 20 seconds was one of the WHO recommendations to prevent COVID-19 pandemics. Therefore, lack of handwashing affected occupational safety and health of health professionals'.

The possibility of isolating suspected cases separately was one of the predictor variables for occupational safety and health of health professionals. Health professionals who can isolate the suspected COVID-19 clients were almost 3 times occupationally health safe than the counterpart (AOR=2.525, 95% CI: 1.690, 5.062). This might indicate that health professionals' who can isolate suspected cases separately from other clients and staff tended to decrease the spread of COVID-19 by avoiding direct contact of COVID-19 infected individuals from non-infected ones.

When there were infections prevention and control program standards and policy in hospitals the occupational safety and health of health professionals increased by 2.33 (AOR=2.329, 95% CI: 1.325, 4.092). Because of the availability of these standards and policies used to enhance health professionals' to implement COVID – 19 prevention and control methods like wearing a mask, wearing gloves appropriately, hand washing, physical distancing, and other precaution from other injuries. This finding was supported by another study.[17]

The availability of policy and procedure to prevent COVID-19 had a statistical significant association with both OHS. Health professionals' who respond as there were policy and procedure to prevent COVID-19 were 2.43 times to have had good occupational safety and health than the counterpart (AOR= 2.427, 95% CI: 1.389, 4.240). The possible reason for this association could be the availability of specific policy and procedure to the prevention of COVID-19 can contribute to OHS directly for implementing prevention and control methods or indirectly by increasing knowledge, attitude, and awareness of health

Table 5 Bivariable and Multivariable Analysis of Factors Associated with Occupational Health and Safety Among Health Professionals at Hospitals in North Showa Zone, Oromia Regional State, Ethiopia, 2020

Characteristics	Category	Occupational Health and Safety		COR (95% CI)	AOR (95% CI)
		Unfavorable n (%)	Favorable n (%)		
Sex	Male Female	73 (45.1) 64 (54.2)	89 (54.9) 54 (45.8)	1 1.445 (0.897–2.327)	– –
Availability appropriate PPE	No Yes	69 (61.0) 68 (40.7)	44 (38.9) 99 (59.3)	1 2.283 (1.401–3.720)	– –
Availability of face mask	No Yes	40 (60.6) 97 (45.3)	26 (39.4) 117 (54.7)	1 1.856 (1.058–3.256)	– –
Availability of enough glove	No Yes	80 (59.3) 57 (39.3)	55 (40.7) 88 (60.7)	1 2.246 (1.392–3.623)	– –
Availability of eye/face protection	No Yes	94 (55.3) 43 (39.1)	76 (44.7) 67)60.9)	1 1.927 (1.183–3.139)	– –
Availability of disinfectants	No Yes	65 (60.2) 72 (41.9)	43 (39.8) 100 (58.1)	1 2.099 (1.286–3.427)	– –
Availability of antiseptics	No Yes	68 (67.3) 69 (38.5	33 (32.7) 110 (61.5)	1 3.285 (1.966–5.489)	– –
Accessibility of handwashing facilities	No Yes	67 (64.4) 70 (39.8)	37 (35.6) 106 (60.2)	1 2.742 (1.659–4.531)	– –
Availability of soap and bleach	No Yes	85 (67.5) 52 (33.8	41 (32.5) 102 (66.2)	1 4.067 (2.465–6.708)	1 2.503 (1.439–4.356)**
Restriction of persons entering the room	No Yes	82 (52.9) 55 (44)	73 (47.1) 70 (56)	1 1.340 (0.890–2.295)	– –
Limit persons while doing aerosol-generating procedures	No Yes	90 (53.9) 47 (41.6)	77 (46.1) 66 (58.4)	1 1.641 (1.013–2.658)	– –
Possibility of isolating suspected COVID-19 cases	No Yes	85 (68) 52 (33.5)	40 (32) 103 (66.5)	1 4.209 (2.547–6.956)	1 2.925 (1.690–5.062)***
Presence of engineering control to shield HCW from Pts.	No Yes	100 (60.6) 37 (32.2)	65 (39.4) 78 (67.8)	1 3.243 (1.966–5.350)	– –

(*Continued*)

Table 5 (Continued).

Characteristics	Category	Occupational Health and Safety		COR (95% CI)	AOR (95% CI)
		Unfavorable n (%)	Favorable n (%)		
Presence of IP & control program and policy	No Yes	71 (67.6) 66 (37.7)	34 (32.4) 109 (62.3)	1 3.449 (2.070–5.746)	1 2.329 (1.325–4.092)**
Policy & protocols for COVI-19 prevention	No Yes	76 (67.3) 61 (36.5)	37 (32.7) 106 (63.5)	1 3.569 (2.157–5.906)	1 2.427 (1.389–4.240)**
Does facility' policy and procedure includes when to notify	No Yes	74 (64.9) 63 (38)	40 (35.1) 103 (62)	1 3.025 (1.841–4.98)	– –

Note: **Statistically significant at P<0.01, ***statistically significant at p<0.001.

professionals'. This variable also showed a similar association in the study conducted in Aksum.[17]

Strength of the Study

The main strength of this study was we have addressed all hospitals in the study area during the sampling procedure, which increases the representatives of the sample to the general population.

Limitation of the Study

The main limitation of this study was the discussion part of this study did not synthesize with other research works since a limited study on OHS during COVID-19 pandemics in other areas.

Conclusions

This study achieves that the safety of health professionals was at risk since their OHS and was low. Among the different potential factors, Availability of soap and bleach, the possibility of isolating suspected cases separately, availability of functional infections prevention and control program standards and policy, and availability of policy and procedure to prevent COVID-19 had a statistically significant association with OHS.

Abbreviations

COVID-19, Coronavirus Diseases 2019; CDC, Communicable Disease and Control; HCW, Health Care Workers; ILO, International Labour Organization; IPC, Infection Prevention and Control; IPCP, Interprofessional Collaborative Practice; MERS, the Middle East Respiratory syndrome; NIOSH, National Institute for Occupational Safety and Health; OHS, Occupational Health and Safety; PPE, Personal Protective Equipment; SARS, Severe Acute Respiratory Syndrome; WASH, Water, Sanitation, and Hygiene; WHO, World Health Organization.

Ethical Considerations

Ethical clearance was obtained from Salale University's ethical review board (permit number: SLUERC 229/20/2020). Letters of support were received from this university. The purpose of the study was explained to the hospital managers and the study participants. The study was conducted according to the Declaration of Helsinki. Before collecting the data, written informed consent was secured from each participant. All information obtained from the Hospital & respondents was kept confidential.

Acknowledgment

We would like to acknowledge Salale University, College of Health Sciences, and all individuals who participated in the success of this study.

Funding

Funding was obtained for this study from Salale University.

Disclosure

The authors declare that they have no conflicts of interest.

References

1. Wang HJ, Du SH, Yue X, Chen CX. Review and prospect of pathological features of coronavirus diseases. *Fa Yi Xue Zahi*. 2020;26 (1):16–20.
2. Singhal T. A review of coronavirus disease-2019 (COVID-19). *Indian J Pediatr*. 2020;87 (4):281–286. doi:10.1007/s12098-020-03263-6
3. Worldometers, Available from: https://www.worldometers.info/. Accessed March 12, 2021.
4. Foruem WE. Why sub-Saharan Africa needs a unique response to COVI-19. Switzerland: Worled Economic Foruem Cologny; 2020.
5. ECDC. Infection prevention and control and preparedness for COVID-19 in health care settings. ET Report, editor. Solna Sweden: ECDC; 2020
6. Agalar C, Engin DO. Protective measures for COVID- ¨ 19 for healthcare providers and laboratory personnel,". *Turk J Med Sci*. 2020;50 (1):564–578. doi:10.3906/sag-2004-132
7. UNICEF. COVID-19 emergency preparedness and response, wash and infection prevention and control in health facilities guidance note. New York, NY, USA: UNICEF, Editor; 2020
8. Capital Ethiopia Newspaper. Coronavirus: WHO lists Ethiopia, 12 others as top-risk African nations. Available from: https://www.capitalethiopia.com/capital/coronavirus-who-lists-ethiopia-12-others-as-top-risk-african-nations/. Accessed March 12, 2021.
9. Aljazeera. Ethiopia confirms first coronavirus case. Available from:-https://www.afro.who.int/news/first-case-covid-19-confirmed-ethiopia. Accessed March 22, 2021.
10. Ethiopian Monitor. Coronavirus: 3 New Cases Identified in Ethiopia; 2020. Available from: https://ethiopianmonitor.com/?s=Coronavirus%3A+3+New+Cases+Identified+in+Ethiopia. Accessed March 12, 2021.
11. WHO. Guidance on preparing workplaces for COVID-19; 2020.
12. Newsweek. Over 100 Doctors and Nurses Have Died Combating Coronavirus Across the World. Available from: https://www.newsweek.com/coronavirus-deaths-infections-doctors-nurses-healthcare-workers-medical-staff-1496056. Accessed February 25, 2021
13. Voice of America. Ethiopia Confirms First Case of Coronavirus. Available from: https://www.voanews.com/science-health/coronavirus-outbreak/ethiopia-confirms-first-case-coronavirus. Accessed march 12, 2021.
14. Anadolu Agency. COVID-19: ethiopia closes schools, bans public events. Available from: https://www.aa.com.tr/en/africa/covid-19-ethiopia-closes-schools-bans-public-events/1767683. Accessed March 12, 2021.
15. Havva Ozturk EB. The occupational safety of health professionals working at community and family health centers. *Iran Red Crescent Med*. 2020.
16. Kassie BA, Eskeziaw Abebe Kassahun AA, Ayele AS, Belew AK. Poor COVID-19 preventive practice among healthcare workers in Northwest Ethiopia, 2020. *Adv Public Health*. 2020;2020:7.
17. Gebrezgiabher BB. Awareness of occupational hazards and utilization of safety measures among welders in Aksum and Adwa Towns, Tigray Region Ethiopia. *J Environ Public Health*. 2013;2019:7.