

Psychological Distress and Associated Factors during COVID-19 Vaccine era among Healthcare Professionals, in Southern Ethiopia, 2021. A Multi-center Study

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Abstract:

Background: A coronavirus disease 2019 is a specific type of coronavirus disease which out broke in 2019 and widespread over the globe in short time causing tremendous loss of life for millions. Thehealth care professionals working in any health institutions are exceptionally inclined to develop psychological distress as result of highly infectious nature of COVID-19 viruses, but a limited study has been conducted in Ethiopia. Hence, studying psychological distress among healthcare professionals during this pandemic is very important.

Objective: To assess the prevalence of psychological distress and its associated factors during COVID-19 vaccine era among healthcare professionals working at Hawassa comprehensive specialized referral hospital and other two COVID-19 centers situated at-Southern Ethiopia in 2021.



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Methods: An institutional based cross-sectional study was conducted from May to Jun 2021. A total of 461 healthcare professionals were selected through a systematic random sampling technique. The self-administered questioners were used. The analysis was done using STATA software, version 14. Bivariate and multivariable logistic regression modeling were performed to identify the associated factors with psychological distress. P-value < 0.05 was considered as statistically significant and the strength of associations were presented by COR and AOR.

Results: Prevalence of psychological distress was found to be 38.5% (95%CI; 34.08%, 43.26%). Psychological distress an outcome in current study has demonstrated a significant association with factors, specifically, being a female (AOR=1.97), being a nurse (AOR=3.6), working in COVID-19 centers (AOR= 8.22), work experience of less than 2 years (AOR=3.8), negative clients' attitude toward face mask use (AOR=7.4), low brief resilient coping level (AOR=3.3) and being stigmatized in the neighborhood because of hospital work (AOR=1.97).

Conclusion and recommendation: Being female, being nurse in profession, being frontline worker, neighborhood stigma for working in a hospital, clients' negative attitude to use facemask, and poor coping were suggestive of potential risk factors of psychological distress of healthcare professionals. Therefore, special concern should be given to these variables while undertaking an intervention in order to minimize the risk of healthcare workers.

Key words: Psychological distress, COVID-19 center, Front-line healthcare workers.

1. INTRODUCTION

a. STATEMENT OF THE PROBLEM

Psychological distress is defined as a concept of maladaptive psychological functioning characterized by perceived inability to cope effectively, change in emotional status, communication of discomfort, and harm while facing stressful live events (1). Depression and anxiety are the most notable variety of mental health disorders that encompassed into psychological distress (1).

A coronavirus disease 2019 is a specific type of coronavirus disease which out broke in the late 2019 and widespread over the globe in short time that caused tremendous loss of life for millions; it largely restricted socio-economic movement and bankrupted the world economy and

still remain a challenge to survival to mankind although the emergence of vaccine has brought a promising future (2, 3). The recent reports of the World Health Organization (WHO) in January 2021- indicated that globally, over 4.7 million new cases and over 93000 new deaths. Since the start of the pandemic this rate of infection has brought the overall numbers reported cases to be greater than 93 million and over 2 million deaths globally (4). The current report made by Ethiopia health institution in January 2021 indicated that a cumulative numbers of 136, 365 reported cases, of this 121,987 people have been subsided from the illness while still 12,289 active cases are suffering from the illness and 20,87 people have died due to this virus since the start of pandemic (5).

This coronavirus disease is characterized as an acute severe respiratory syndrome coronavirus-2 (SARS-CoV-2), which is a beta-coronavirus that can be transmitted from human to human, through a droplets or tiny particles called aerosols when an infected person cough, sneezes, or talks (6). The virus was first appeared in Wuhan, Hubei province, China, as an outbreak of pneumonia of unknown cause in December, 2019 (6).

For those people caring for people with respiratory symptoms and COVID-19 cases WHO continues to recommend droplet and contact precaution (7). If handwashing or other method of infection prevention and control measures are not in place health-care workers can be initially at risk and infected when they examine and treat patients who present with a respiratory infection, thus health professionals are at high risk of infection and become the inadvertent carriers to patients who are in hospital for other diseases and treatments, family members, and the community (7).

The health care professionals who are working in any health institutions are exceptionally inclined to develop psychological distress as result of highly infectious nature of COVID-19 viruses (3). This psychological distress among health care professionals is aggravated by severely inadequate personal protective equipment (PPE) in hospitals (8).

According to the study done amid the introductory stage of the COVID-19 widespread, mental distress among health-care laborers common in all nations whether developed or developing and may be a major open wellbeing challenge (9-11). A study carried out in China on healthcare

workers found that the overall Psychological distress among participants amid the COVID-19 widespread was 56.59% (12). A study done in Palestine on mental distress among frontline healthcare experts showed most respondents (74.0%) detailed high-stress level amid COVID-19 flare-up (13). Study conducted at Jimma, in Ethiopia found that 78.3% of healthcare workers have reported psychological distress (14).

2. Materials and Methods

2.1 Study design and period

An institutional based cross-sectional study design was employed to conducted this study, which lasted from May to June, 2021.

2.2. Study area

The study was conducted in Hawassa comprehensive specialized referral hospital (HCSRH), Hawassa COVID-19 center, and Shashemane COVID-19 center, in Southern Ethiopia. HCSRH, situated in Hawassa city which is located at a distance of 273 KM far to the South of Addis Ababa, the capital of Ethiopia and has a total of 157, 879 populations according to national census report made in 2007 (27). In addition to usual healthcare services HCSRH has established COVID-19 center during the early phase of COVID-19 pandemic spread. A total of 782 healthcare professionals were working in the institution during the study period. Hawassa COVID-19 center found in Hawassa city and hosts a total of 85 healthcare professionals who were giving services during the study period. Shashemane is a town of West Arsi Zone that found at distance of 240 KM from Addis ababaand 25KM far from Hawassa city. Shashemane COVID-19 center located at Kuyara kebele and 13 healthcare professionals were giving services during the study period.

2.3. Source population

All healthcare professionals who were working at Hawassa comprehensive specialized referral hospital and Hawasa and Shashemane COVID-19 centers.

2.4. Study population

Healthcare professionals who were working at Hawassa comprehensive specialized hospital, Hawassa and Shashemane COVID-19 centers and who were included into the study sample.

2.5. Study unit

The study unit is an individual healthcare professional who was randomly selected during the study period.

Inclusion and exclusion criteria

Inclusion criteria

- ✓ Healthcare professionals working in the HCSRH, Hawasa and Shashemane COVID-centers during the study period.

Exclusion criteria

- ✓ Healthcare professionals who were in seriously ill state and unable to respond for the questionnaire.
- ✓ Those healthcare professionals who are in quarantine state at their home

2.6 Study variables

Dependent variables

The psychological distress is an intended outcome of the current study and considered as the dependent variable of this study with yes/no options.

Independent variables

- Sociodemographic factors (sex, age, marital status, residence, monthly income, specialty, working unit, and work experience)
- COVID-19 spread related work factors (being frontline workers, exposure history to COVID-19 cases)
- Psychosocial related factors (brief adaptive level, social support level, fear of transmitting the virus to family members, and receiving negative feedback)
- Protection related factors (training, PPE, up to dated information, and facemask usage attitude)
- Clinical related factors (history of MI, DM, HIV/AIDS, hypertension, and life time and current substance use history).

2.7. Operational definition

Psychological distress- is a state of emotional suffering associated with stressors and demands that are difficult to cope with in daily life. On Kessler 10 item scale a score of 20 or above is considered as having psychological distress (28).

Brief resilient coping level: the capacity level of an individuals to cope with stress adaptively and it will be measured by brief resilient coping scale (BRCS) which has four item that has five-point scale response, ranging 1= doesn't describe me at all to 5= describes me very well and the total sum score range from 4 to 20 (29).

Healthcare professionals (HCP): refers to those healthcare workers such as medical doctors, health officers, nurses, midwives, pharmacist, laboratory technician, physiotherapist and radiologist

Frontline healthcare workers: refers to those participants who are directly engaged in clinical activities of diagnosing, treating, or providing nursing care to patients with confirmed COVID-19 viruses

Non-frontline healthcare workers: refers to those participants who are not directly engaged in clinical activities of treating, or providing nursing care to patients with confirmed COVID-19 viruses

2.8. Sample size determination and Sampling techniques

The minimum number of sample required for this study was determined by using single population proportion formula. 95% confidence level, 4% margin of error (d^2), and prevalence (p) of psychological distress among healthcare workers at Jimma, Ethiopia which was 78.3% (14).

$$n = \frac{(Z_{\alpha/2})^2 \times (p)(1-p)}{d^2} = \frac{(1.96)^2 \times (.783)(0.217)}{(0.04)^2} = 407.9 \approx 408$$

Since the total population was less than 10,000 the sample size was reduced slightly by using

$$n = \frac{n_o}{1 + \frac{n_o - 1}{N}} = \frac{408}{1 + \frac{408 - 1}{880}} = 278.9 \approx 279$$

Due to the design effect the sample size was multiplied by 1.5, then it has been 419 by adding 10% of none response rate, the final sample size was 461.

2.9. Data collection tools and procedure

The data was collected by using pretested, structured, self-administered questionnaire. The questionnaire was included:

Kessler psychological distress scale (K10, Ronald C. Kessler, 1992) - this tool which consists of 10 items was used to assess the psychological distress for current study. The instrument was previously adapted in Ethiopian context and used to determine psychological distress in this segment of population during the early phases of COVID-19 pandemic (21). Based on query about anxiety and depressive symptoms that a person has experience in the past 30 days, K10 item questionnaire is aimed to yield global measure of mental distress. The total sum scores for individual participants was range from 10 to 50 (28). The final score was categorized into four level: those who score less than 20 are likely to be well, score 20-24 are likely to have mild mental distress, score 25-29 are likely to have moderate mental distress, score 30 and above are likely to have severe mental distress (28). This tool has validated in Ethiopia among postnatal mothers with sensitivity of 84.2%, specificity 77.8%, misclassification rate 21.0%, and cronbach's alpha 0.90 (31)

Brief resilient coping level (BRCS) (32). This tool was employed to measure brief adaptive level of healthcare professionals toward perceived hazard of COVID-19 during the pandemic vaccine era. "The brief resilient coping scale (BRCS) captures tendencies to cope with stress adaptively. The scale focuses on the tendencies to effectively use coping strategies in flexible, committed ways to actively solve problems despite stressful circumstances". The scale has four item which has five-point scale response, ranging 1= doesn't describe at all to 5= describes me very well and the total sum score range from 4 to 20. Then the total score was categorized into three level: score 4-13 indicate low adaptive level, score 14-16 medium adaptive level, and score 17 and above indicate high adaptive level.

Oslo Social Support scale, three items (OSS3): social supports was assessed by the Oslo-3 social support scale which the total sum score that range from 1 to 14 points and a total score was divided into three groups poor, moderate, and high social support that was 3-8, 9-11 and 12-14 respectively (30). A good reliability and validity of Oslo-3 social support scale has shown with Cronbach's α ranging between 0.83 to 0.86 (33).

Sociodemographic questionnaire:

The range of key socio-demographic factors such as sex, age, residence, marital status, having children, monthly income, specialty, working unit and work-experience were measured.

2.10. Data quality assurance

The standardized self-administered questionnaires were forward translated from the source language (English) into the target language (Amharic) by an independent bilingual expertise. Then, it was translated back into English language by other independent bilingual expertise to ensure semantic validity. To ensure quality of this study pre-test was conducted at Dilla hospital in Gedeo Zone on the 23 participants from target population, taking the 5% of the sample size. The tool was further checked for consistency showed Cronbach's' alpha (0.81). Two days training was given for three facilitators who were recruited by principal investigator. The facilitators checked consistency and completeness of the questionnaire items for each participant on daily basis during data collection on respective study sites. Sufficient information regarding relevance and potential benefits of the study was explicitly informed to the participants as to engage them motivated to participate in the study and minimize the likelihood of attrition rate.

2.11. Data processing and analysis

The collected data were checked for coding error, sorted, and entered into EpiData version 4.6 computer programs. Next the data was exported to STATA version 14 computer programs. Then the data was managed, cleaned and analyzed by using this software. Descriptive statistics (frequency, percent, mean, and standard deviation) were used to summarize data and evaluate distribution of responses. In order to identify associated factors of psychological distress, first participants were classified into dichotomous groups by using cut-off point 20; those- having psychological distress (scored ≥ 20 point on Kessler 10), and those do no psychological distress (scored < 20 point on the same measure).

The association between independent variables and psychological distress were carried out by performing analysis of binary logistic regression with odds ratio and 95% CI. Multivariate logistic regression analysis was carried out to identify the association of each independent variable with dependent variable. The model was checked for the goodness with the Hosmer-

Lemeshow goodness-of-fit test and R-squared value. All variables with a p value of less 0.2 in univariate analysis were entered into the multivariate logistic regression model. In multivariate logistic regression model P value less than 0.05 was considered as statistically significant.

2.12. Ethical consideration

Ethical clearance was obtained from ERB of the University of Gondar CMHS. The permission to conduct the research was obtained from the chief executive officer (CEO) of Zonal health office, respective CEO of healthcare institution and head of COVID-19 centers. The necessary ethical consideration as per Helsinki's declaration of ethics involving human participants in research was adhered. For the participation in this study, no payment was granted. Participation was totally based on full consent of the participants and he/she was not obliged to give a response to any of questionnaire items irrespective of his/her consent. More specifically the participant has the full mandate to withdraw himself/herself at any time before involving in the study or during the time of participation.

3. Results

3.1 Socio-Demographic Characteristics of the Respondents

From a total of 461 participants who were approached during study, 433 respondents were participated in the study yielding a response rate of 94.0%. Among the respondents, the percentage of female participants is a bit higher (54.5%) compared to the male participants. The majority of the respondents were within the age range of 25–30 years 45.03%. The mean age was 31.24 years (SD \pm 0.305). In terms of residence, 97.0% of respondents were urban resident. Of all healthcare professionals involved in the study more than one tenth (10.62%) were working in COVID-19 center and directly involved in the treatment of those patients suffering from this pandemic disease.

COVID-19 spread and protection related factors Regarding exposure status of respondents to COVID-19 cases nearly fifty percent (49.2%) reported history of exposure to confirmed cases. Of total participants more than two third (70%) did not get the necessary training on the outbreak control, 64.2% of respondents reported that they are not satisfied by existing personal protective equipment necessary to safeguard themselves from COVID-19 while treating the patients in their

institution. Among participants 74.6% of respondents reported that their clients' attitude toward face mask use is poor

Regarding psychosocial factors, the current finding indicated that 48.5% of the participants scored low resilient coping level, whereas 42.73% of the participants scored low on received social supports from neighbors, family and friends. Regarding the fear, the participants they inflicted from the point of their current professional engagement 49.9% of the participants reported that they have the concern for transmitting the virus to their family owing to the fact that they are working in the hospital or COVID-19 centers were these places are risky place for contracting the pandemic virus

Factors regarding psychological distress From multivariable logistic regression analysis variables sex, being a nurse, working in COVID-19 center, work experience, clients' attitude toward use of face mask, level of brief resilient coping, and stigma from neighborhood because of hospital work, were significantly associated with psychological distress at ($P \leq 0.05$). Hosmer and Lemeshow indicates (P -value = 0.92). The odds of developing psychological distress among female respondents was nearly twice higher as compared to those of male respondents (AOR = 1.97, CI 95% (1.15, 3.36). Nurses were 3.6 times more likely to develop psychological distress as compared to doctors (AOR = 3.6, 95% CI (1.63, 8.00). Those healthcare professionals working in COVID-19 centers were 8 times higher most likely to develop psychological distress when compared to other units (AOR = 8.22, 95% CI (1.22, 55.26). Having a work experience of less than 2 years is 3.8 times high risk of developing psychological distress when compared to work experience of more than 10 years (AOR= 3.8, 95% CI (1.15, 12.61). The odds of developing psychological distress among healthcare professionals perceived poor clients' attitude toward facemask use were 7.4 times higher as compared to their colleagues (AOR = 7.4, 95% CI (2.62, 21.03). Thus all we saw about the result part.

4. Discussion

This cross-sectional study had tried to determine the magnitude of psychological distress and associated risk factors among healthcare professional working in Hawassa comprehensive Specialized referral hospital, Hawassa and Shashemane COVID-19 centers using a Kessler-10

item scale. The findings are discussed in light with an established previous evidences together with possible explanations of the current evidence by the student research. And also there is an cross sectional study to assess the levels of psychological distress in health care workers on duty during the pandemic conducted in dessie town , Ethiopia. The result of that study shows almost 42% of the health care workers screened to be positive for psychological distress in that 13% of them have severe psychological distress. There is coincidental study represents the magnitude of psychological problem and associated factors in response to COVID-19 among communities living in addisababa, capital of Ethiopia. It shows 66.4% of the respondents were experienced moderate to severe form of psychological problem including stress, anxiety, and depression in response to COVID-19. Thus it clearly emprise’s that there is an association between pandemic and psychological distress is common among health care workers and also among general population .

5. Conclusion

This study revealed considerably high prevalence of psychological distress among healthcare professionals working in hospitals and COVID-19 centers. In the current study variables such as being female, being nurse in profession, being frontline worker, neighborhood stigma for working in a hospital, clients’ negative attitude to use facemask, and poor coping were suggestive of potential risk factors of psychological distress of healthcare professionals.

6. Tables and diagrams

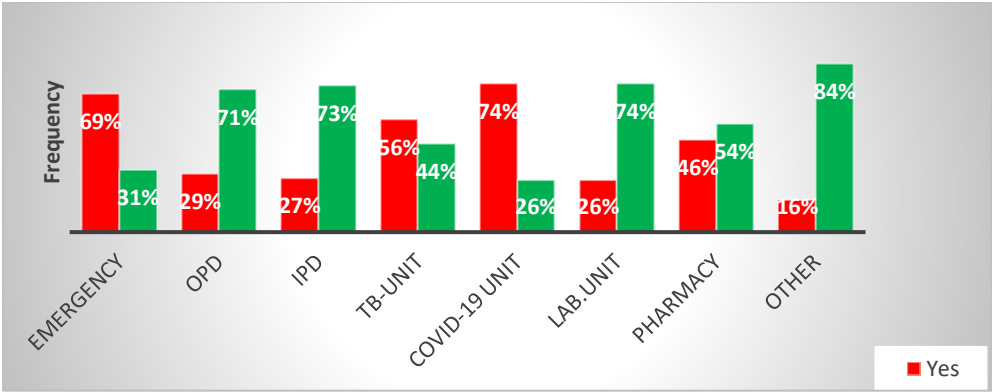


Figure1. Description of prevalence of psychological distress with respect to working unit of healthcare institution. (n = 433)

**Psychosocial characteristics of the study participants at HCSRH, Hawassa COVID-19 and
Shashemane COVID-19 centers (n = 433)**

Variable	Category	Frequency	Percent (%)
Brief resilient coping levels	Low	210	48.50
	Moderate	45	10.39
	High	178	41.11
Social support levels	Low	185	42.73
	Moderate	83	19.17
	High	165	38.11
Do you have fear of transmitting the virus to family since you work in hospital?	Yes	216	49.88
	No	217	50.12

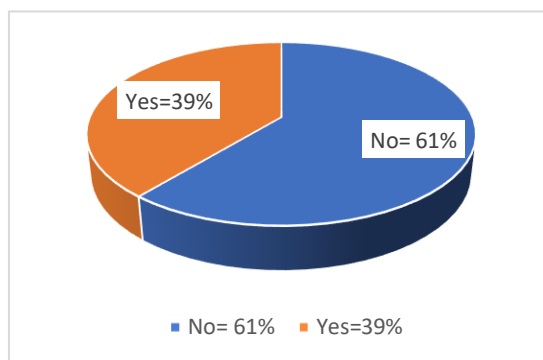


Figure 2. Prevalence of psychological distress among Healthcare professionals working in HCSRH, Hawassa and Shashemane COVID-19 centers in Ethiopia, 2021. (n = 433)

Table 1: Sociodemographic characteristics of respondents of HCSRH, Hawassa and Shashemane COVID-19 centers, Southern Ethiopia, 2021 (n= 433).

Variable	Category	frequency	Percentage(%)
Sex	Female	236	54.5
	Male	197	45.5
Age	20-24	43	9.93
	25-30	195	45.03
	31-34	82	18.94

	≥35	113	26.10
Residence	Urban	420	97.0
	Rural	13	3.0
Marital status	Single	228	52.66
	Married	191	44.11
	Divorced	9	2.08
	Widowed	5	1.15
Having children	Yes	165	38.11
	No	268	61.89
Monthly-income	< 3000 birr	4	0.92
	3000 to < 4000 birr	51	11.78
	4000 to < 5000 birr	168	38.80
	>5000 birr	210	48.50
Specialty	Doctors	72	16.63
	Nurses	245	56.58
	Midwife	43	9.93
	Pharmacist	23	5.31
	Lab. Technicians	30	6.93
	Others *	20	4.62
Working unit	Emergency	51	11.78
	OPD	59	13.63
	IPD	205	47.34
	TB-unit	18	4.16

	COVID-19 center	46	10.62
	Lab	23	5.31
	Pharmacy	13	3.0
	Others **	18	4.16
Work-experience	< 2 year	70	16.17
	2-5 years	165	32.11
	5-10years	140	32.23
	>10 years	58	13.39

Table 2: Bivariate and multivariable logistic regression analysis for factors associated with psychological distress among healthcare professional working at HCSRH, Hawassa and Shashemane COVID-19 Centers (n = 433)

Variable	Psychological distress		COR (95% CI)	P value	AOR (95% CI)	P value
	Yes	No				
Sex						
Female	112	124	2.33(1.55, 3.48)	0.000*	1.97(1.15, 3.36)	0.013*
Male	55	142	1		1	
Specialty of respondents						
Doctors	16	56	1		1	
Nurses	113	132	2.99 (1.63, 5.51)	0.000*	3.61(1.63, 8.00)	0.002**
Midwife	13	30	1.52 (0.64, 3.57)	0.340	1.88(0.61, 5.79)	0.274
Pharmacist	12	11	3.82 (1.42, 10.26)	0.008*	1.84(0.49, 6.81)	0.363
Lab. technician	8	22	1.27 (0.48, 3.39)	0.630	1.16(0.33, 4.03)	0.815
Others*	5	15	1.17 (0.37, 3.70)	0.794	5.70(0.64, 50.72)	0.118
Working unit						
Emergency	35	16	10.94(2.77, 3.19)	0.001*	2.27(0.35, 14.82)	0.394
OPD	17	42	2.02(0.52, 7.89)	0.310	0.72(0.11, 4.73)	0.735

IPD	56	149	1.88(0.52, 6.74)	0.333	0.39(0.07, 2.31)	0.302
TB-unit	10	8	6.25(1.33, 29.43)	0.020*	1.53(0.18, 12.70)	0.693
COVID 19-center	34	12	14.17(3.48, 7.65)	0.000*	8.22(1.22, 55.26)	0.030*
Lab.unit	6	17	1.76(0.37, 8.32)	0.473	1.03(0.12, 8.99)	0.978
Pharmacy	6	7	4.29(0.82, 22.34)	0.084*	0.76(.09, 6.41)	0.801
Other**	3	15	1		1	
Work- experience						
<2 years	38	32	4.11(1.89, 8.93)	0.000*	3.80(1.15, 12.61)	0.029*
2-5 years	72	93	2.68(1.34, 5.34)	0.005*	2.38(0.87, 6.51)	0.093
5-10 years	44	96	1.59(0.78, 3.24)	0.204	1.33(0.51, 3.48)	0.555
>10 years	13	45	1		1	
Did you get training						
Yes	35	94	1		1	
No	132	172	2.06(1.31, 3.23)	0.002*	1.42(0.76, 2.66)	0.266
Is there adequate PPE in your institution						
Yes	39	116	1		1	
No	128	150	2.54(1.65, 3.91)	0.000*	1.97(0.97, 4.03)	0.062
How did you perceived clients' attitude toward facemask use						
Good	9	101	1		1	
Poor	158	165	10.74(5.25, 1.98)	0.000*	7.43(2.62, 21.02)	0.000**
Brief resilient coping level						
Low	116	94	5.23(3.29, 8.29)	0.000*	3.31(1.65, 6.61)	0.001**
Moderate	17	28	2.57(1.26, 5.23)	0.009*	1.34(0.53, 3.41)	0.539
High	34	144	1		1	
Social support level						
Low	92	93	2.64(1.69, 4.13)	0.000*	1.98(0.89, 4.43)	0.092
Moderate	30	53	1.51(0.86, 2.65)	0.152*	1.62(0.67, 3.88)	0.281
High	45	120	1		1	

Did you feel stigmatize by the neighbor because of hospital work						
Yes	129	114	4.52(2.93, 6.99)	0.000*	1.97(1.09, 3.54)	0.025*
No	38	152	1		1	

Other* = Officers: Other** = administration departments, OPD = out patient's department, IPD = in patient's department, COVID-19 = corona virus 2019, * = ($p < 0.05$), ** = ($p \leq 0.01$)

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Conflicts of Interest

The authors declare that there are no conflicts of interest.

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Ethics approval This study was approved by the Institutional review Board of the University of Gondar.

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