



BMJ Open Prevalence and determinant factors of mental health problems among healthcare professionals during COVID-19 pandemic in southern Ethiopia: multicentre cross-sectional study

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ABSTRACT

Objective To assess the prevalence of depression, anxiety and stress and its determinant factors during COVID-19 pandemic among healthcare professionals in southern Ethiopia.

Design Multi-centre cross-sectional study.

Setting and study period Randomly selected public hospitals in Sidama, southern Ethiopia between 25 September 2020 and 25 October 2020.

Participants 387 healthcare professionals were randomly selected.

Outcome measures Prevalence and determinant factors of depression, anxiety and stress was assessed.

Result Depression, anxiety and stress prevalence were shown to be 50.1% (95% confidence interval (CI) 45.0% to 55.0%), 55.0% (95% CI 51.1% to 59.9%) and 38.5% (95% CI 33.6% to 43.2%), respectively. Being female (adjusted odd ratio (AOR) 3.71, 95% CI 2.31 to 5.97), married (AOR 2.28, 95% CI 1.34 to 3.86), living alone (AOR 1.87, 95% CI 1.09 to 3.20), nurses (AOR 2.94, 95% CI 1.44 to 5.99) and working in inpatients (AOR 0.53, 95% CI 0.29 to 0.93) were significantly associated with depressive symptoms. Moreover, older age groups (AOR 3.15, 95% CI 1.04 to 6.56), females (AOR 3.25, 95% CI 2.01 to 5.25), married (AOR 1.69, 95% CI 1.01 to 2.87) and nurses (AOR 3.32, 95% CI 1.63 to 6.78) were significantly associated with symptoms of anxiety. Stress symptoms were significantly high among females (AOR 2.47, 95% CI 1.53 to 3.97), married (AOR 2.77, 95% CI 1.60 to 4.78), living alone (AOR 2.01, 95% CI 1.15 to 3.52), nurses (AOR 2.34, 95% CI 1.11 to 4.92) and working in units other than emergency (inpatient (AOR 0.32, 95% CI 0.18 to 0.57) and other units (AOR 0.48, 95% CI 0.25 to 0.95)).

Conclusion The current study found that healthcare professionals have high levels of depression, anxiety and stress symptoms. Sex, age, marital status, type of profession, living status and working environment were significant factors for mental health problems in healthcare professionals during the pandemic. Healthcare professionals require mental health support at which monitoring and control can be performed during and after the pandemic.

Strengths and limitations of this study

- This study assessed the depression, anxiety and stress among Ethiopian healthcare professionals during the COVID-19 pandemic.
- Mental health problems were assessed solely through self-administered questionnaires rather than through a psychiatric interview.
- This is a cross-sectional study that does not determine cause and effect relationship.
- No information on the type of mental health support received by healthcare workers could be obtained.

INTRODUCTION

COVID-19 pandemic, which began in China, continues to pose a global health hazard.¹ The COVID-19 outbreak was declared as a public health emergency of worldwide concern by WHO on 30 January 2020.² Globally, there have been 236 875 393 COVID-19 cases and 4 715 147 deaths as of 31 October 2021. In Ethiopia, there were 365 167 confirmed COVID-19 cases and 6459 deaths in the country by the end of October 2021 with a 1.77% case fatality rate. Ethiopia is now ranked fifth in Africa in terms of confirmed COVID-19 infections and deaths.³

In addition to physical pain, COVID-19 causes substantial psychological stress and other health-related difficulties. Healthcare workers (HCWs) are no exception, as they are responsible for infected patients, have frequent interactions with their families/relatives and are occasionally scrutinised by the public.⁴ Healthcare professionals (HCPs) around the world have been subjected to excessive workloads and psychological stress as a result of the massive number of cases

and deaths associated with this pandemic, which has increased the burden on the healthcare system, potentially resulting in negative consequences for society.⁵ HCPs are directly involved in the diagnosis, treatment, and care of COVID-19 patients on a daily basis. They spend an average of 16 hours per day caring for COVID-19-infected patients, which is an exhausting workload.⁶ Furthermore, the rising number of confirmed and suspected cases, the depletion of personal protective equipment (PPE), the lack of specific drugs available for COVID-19 treatment and feelings of being under supported by healthcare delivery system are all thought to contribute to HCPs' psychological burdens.⁷

A recent systematic review, during the COVID-19 pandemic, the pooled prevalence of anxiety, depression and distress among HCPs accounted to 40%, 37% and 37%, correspondingly.⁸ According to a recent study including 1563 health professionals, more than half (50.7%) of the participants reported depressive symptoms, 44.7% experience anxiety and 36.1% have sleep disturbances.⁹ During the initial outbreak of COVID-19, a survey was conducted in China. According to the findings of this study, 53.8% of respondents rated the psychological impact of the outbreak as moderate to severe; 16.5% reported moderate to severe depressive symptoms; 28.8% reported moderate to severe anxiety symptoms and 8.1% reported moderate to severe stress levels.¹⁰ Another study in Singapore found that 14.5% of participants tested positive for anxiety, 8.9% for depression, 6.6% for stress and 7.7% for clinical concern of post-traumatic stress disorder (PTSD). Anxiety was more prevalent among nonmedical HCPs than among medical personnel (20.7% vs 10.8%).¹¹

Recent studies in different parts of Ethiopia indicated that HCPs were experience to various mental health problems following COVID-19 pandemic. For instance, a study conducted in Ethiopia showed that about one-fourth (26.8%) experience anxiety,¹² 78.3% developed psychological distress¹³ and about half (51.6%) experienced perceived stress.¹⁴ Another similar study conducted in northern Ethiopia also found out that 58.2%, 64.7% and 63.7% HCPs experienced symptoms of depression, anxiety and stress, respectively.¹⁵

Psychological difficulties are most likely to occur for HCPs working in emergency areas, intensive care units (ICUs) and insulation rooms.¹⁶ According to a study conducted in Singapore, doctors and single people are more likely to acquire psychiatric symptoms than nurses and married people.¹⁷ In addition, a lack of social support and communication, as well as maladaptive coping and a lack of training, are all key risk factors for psychological morbidity.¹⁶

HCPs often have several psychological problems in a high-pressure, high-risk antipandemic setting.¹⁸ As a result, psychological evaluation and intervention in victims and rescuers, such as medical personnel and volunteers, is critical for pandemic control. This concept is advantageous not only for early intervention and psychological intervention, but also for significantly improving pandemic

control and hastening social recovery.¹⁹ As a result, HCPs' moral and mental health should be protected, as this can have an impact on the success of healthcare delivery and COVID-19 control.

The mental health problems of HCPs in Ethiopia during the peak of the COVID-19 pandemic were yet unknown. This is especially important given the unpredictability of such an outbreak. This study investigates the mental health impact of the COVID-19 epidemic in southern Ethiopia for these reasons. As the COVID-19 pandemic spreads across Ethiopia, this could help government organisations and HCPs protect the community's mental health. Thus, the aim of this study was (1) to assess prevalence of depression, anxiety, stress symptoms and its determinant factors among HCPs and (2) to describe common causes of fear/anxiety among HCPs during COVID-19 pandemic in southern Ethiopia.

MATERIALS AND METHODS

Study area

This study was conducted at selected public hospitals (Hawassa University Comprehensive Specialised Hospital, Adare General Hospital, Leku Primary Hospital and Yirgalem General Hospital) in Sidama National Regional State, southern Ethiopia.

Study design and period

Institution-based cross-sectional study design was conducted among HCPs between 25 September 2020 and 25 October 2020.

Study subjects

This study was conducted among front-line HCPs working in medical and surgical inpatient units, ICUs, emergency departments and outpatient units. In addition, non-front-line health professionals who are working at regular chronic care clinic, laboratory, pharmacy, delivery, etc units were included.

Sample size and sampling procedure

The required sample size was determined using single population proportion formula

$$n = (Z^2 * P(1 - P)) / d^2$$

where n is the sample size, z is the standard normal score set at 1.96, d is the desired degree of accuracy and p is the estimated proportion of the target population. Due to the lack of previous research to inform our expected sample proportion (p), we use a value that gives our sample size maximum that is, p=0.5. Then by taking p=50%. Z=1.96 and w=5%, the computed sample size was 384 and by taking 10% non-response rate, the total sample size computed was 422. The overall sample size was proportionally allocated to each health institution. Then simple random sampling method was used to select the study participants by taking the lists from the human resource office of each respective health institution.

Data collection tools

Data were collected by using structured self-administered questionnaire. The questionnaire consists three parts that is, sociodemographic characteristics of participants, items to assess common sources of fear/anxiety in HCPs and items to assess dependent variables. The 21-items Depression, Anxiety and Stress Scale (DASS-21) tool was used to assess depression, anxiety and stress symptoms.

Mental health status was measured using the DASS-21 and calculations of scores were based on the previous study.²⁰ The total depression subscale score was divided into normal (0–4), mild,^{5–6} moderate,^{7–10} severe^{11–13} and extremely severe (14+). The total anxiety subscale score was divided into normal (0–3), mild,^{4–5} moderate,^{6–7} severe^{8–9} and extremely severe (10+). The total stress subscale score was divided into normal (0–7), mild,^{8–9} moderate,^{10–12} severe^{13–16} and extremely severe (17+). The cut-off score for depression, anxiety and stress were 4/5, 3/4 and 7/8, respectively.²¹ DASS had a very good internal consistency in this study with a cronbach's α of 95.9.

Four nurses were involved in data collection after receiving a 2-day intensive training on data collection techniques. A pretest was performed in 5% of the sample to identify potential problems with data collection instruments and to ensure the consistency of the questionnaires. During the data collection process, supervisors checked each questionnaire for completeness on a daily basis.

Data processing and analysis

Collected data were entered to Epi-data V.3.1 and exported to SPSS V.24 for windows for analysis. Descriptive statistics were used to identify distributions of sociodemographic characteristics of the study participants. The magnitude of depression, anxiety and stress were described as a percentage. Logistic regression analyses with 95% CI were used to see the association between each independent and outcome variable. Finally, those variables which showed statistical significance at $p < 0.05\%$ and 95% CI in the final model was reported as independently associated with the outcome variables. The model fitness test was checked using the Hosmer and Lemeshow goodness of fit test. The p values of Hosmer-Lemeshow goodness-of-fit test were greater than 0.05 for all the models.

Patients and public involvement

Patients and the public were not involved in this study, including the recruitment, data collection, analysis, interpretation and dissemination of the results.

RESULTS

Sociodemographic characteristics

A total of 387 health professionals participated in the study. The majority of study participants 227 (58.7%) were male, 233 (60.2%) were aged 26–35 years, nearly half 191 (49.4%) were married, about three-fourth 298 (77.0) had BSc degree, 230 (59.4%) had ≤ 5 years of experience,

Table 1 Sociodemographic characteristics of the study participants during COVID-19 pandemic in selected hospitals of Sidama National Regional State, 2020 (n=387)

Variable	Category	Frequency	%
Sex	Male	227	58.7
	Female	160	41.3
Age	<25 years	112	28.9
	26–35 years	233	60.2
	≥ 36 years	42	10.9
Marital status	Single	185	47.8
	Married	191	49.4
	Divorced	11	2.8
Religion	Protestant	189	48.8
	Orthodox	159	41.1
	Muslim	23	5.9
	Others*	16	4.1
Educational status	Diploma	47	12.1
	BSc degree/ equivalent	298	77.0
	MSc degree or above	42	10.9
Average monthly income	< 7000 ETB	233	60.2
	≥ 7000 ETB	154	39.8
Work experience in years	≤ 5 years	230	59.4
	6–10 years	121	31.3
	≥ 11 years	36	9.3
Place of residence	Rural	72	18.6
	Urban	315	81.4
Living status	With family	224	57.9
	Alone	143	37.0
	With others	20	5.3
Profession	Physician	88	22.7
	Nurses	197	50.9
	Other professionals	102	26.4
Working environment	Emergency	138	35.7
	Inpatient units	120	31.0
	OPD	58	15.0
	Others†	71	18.3

*Catholic, traditional.

†Delivery, laboratory, pharmacy, ART(antiretroviral)clinics, TB (tuberculosis) clinics, etc. ART, antiretroviral; BSc, Bachelor of Science; ETB, Ethiopian Birr; MSc, Master of Science; OPD, outpatient department; TB, Tuberculosis.

224 (57.9%) were living with their family, half 197 (50.9%) were nurses by profession and about one-third 138 (35.7%) were working at emergency department as described in [table 1](#).

Table 2 What do you think you are most concerned about as a source of fear or anxiety? (N=387)

Items	Yes (%)	No (%)
Access to appropriate personal protective equipment	305 (78.8)	82 (21.2)
Being exposed to COVID-19 at work and taking the infection home to their family	247 (63.8)	140 (36.2)
Not having rapid access to testing if they develop COVID-19 symptoms and concomitant fear of propagating infection at work	101 (26.1)	286 (73.9)
Uncertainty that their organisation will support/takecare of their personal and family needs if they develop infection	104 (26.9)	283 (73.1)
Access to childcare during increased work hours and school closures	55 (14.2)	332 (85.8)
Support for other personal and family needs as work hours and demands increase (food, hydration, lodging, transportation),	73 (18.9)	314 (81.1)
Being able to provide competent medical care if deployed to a new area (eg, non-ICU nurses having to function as ICU nurses),	59 (15.2)	328 (84.8)
Lack of access to up-to-date information and communication	99 (25.6)	288 (74.4)
Previous exposure to COVID-19 infected patient	48 (12.4)	339 (87.6)

ICU, intensive care unit.

Common source of fear or anxiety in HCPs

Among the most common causes of anxiety, fear or psychological distress that health professionals reported were lack of access to PPEs 305 (78.8%), followed by being exposed to COVID-19 at work and taking the infection home to their family 247 (63.8%) and uncertainty that their organisation will support/takecare of their personal and family needs if they develop infection 104 (26.9%) as shown in [table 2](#).

Prevalence of mental health problems

The prevalence of depression, anxiety and stress symptoms among HCPs were 50.1%, 55.0% and 38.5%, respectively ([figure 1](#)).

Moreover, 41 (10.6%) and 44 (11.4%) participants had severe and extremely severe level of depressive symptoms. One out of five, 88 (22.7%) and 20 (5.2%), participants had extremely severe level symptoms of anxiety and stress, respectively ([table 3](#)).

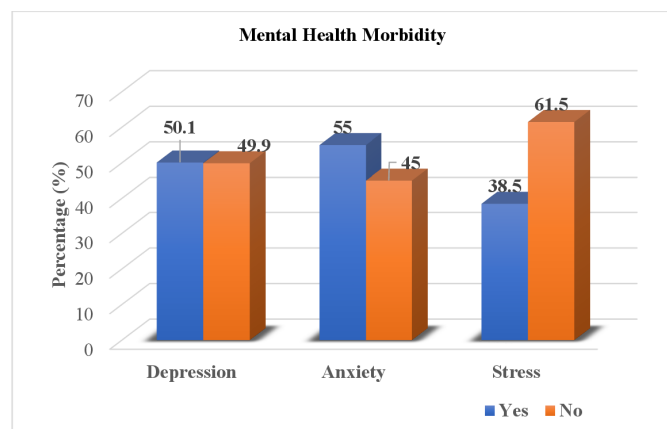


Figure 1 Prevalence of mental health problems of the study participants during COVID-19 pandemic in selected hospitals of Sidama National Regional State, 2020 (n=387).

Independent predictors of mental health problems

Being female (AOR 3.71, 95% CI 2.31 to 5.97), married (AOR 2.28, 95% CI 1.34 to 3.86), living alone (AOR 1.87, 95% CI 1.09 to 3.20), nurses (AOR 2.94, 95% CI 1.44 to 5.99), and working in inpatients (AOR 0.53, 95% CI 0.29 to 0.93) were significantly associated with depressive symptoms ([table 4](#)).

Moreover, older age groups (AOR 3.15, 95% CI 1.04 to 6.56), females (AOR 3.25, 95% CI 2.01 to 5.25), married (AOR 1.69, 95% CI 1.01 to 2.87) and nurses (AOR 3.32, 95% CI 1.63 to 6.78) were significantly associated with symptoms of anxiety ([table 5](#)).

Stress symptoms were significantly high among females (AOR 2.47, 95% CI 1.53 to 3.97), married (AOR 2.77, 95% CI 1.60 to 4.78), living alone (AOR 2.01, 95% CI 1.15 to 3.52), nurses (AOR 2.34, 95% CI 1.11 to 4.92) and working in units other than emergency unit (inpatient (AOR 0.32, 95% CI 0.18 to 0.57) and other units (AOR 0.48, 95% CI 0.25 to 0.95)) as indicated in [table 6](#).

DISCUSSION

As far as the best of our knowledge, this is one of the first few studies in southern Ethiopia which examines the adverse outcomes of mental health among HCPs during COVID-19. The psychological reaction of HCPs to an outbreak of infectious diseases is complex and may be influenced by a variety of factors. In our study, the most common sources of fear/anxiety were a lack of access to PPEs 78.8%, fear of being exposed to COVID-19 at work and spreading the infection to their family 63.8%, and uncertainty that their organisation will support/take care of their personal and family needs if they become infected 26.9% as reported in previous studies.⁷

In our study, the prevalence of symptoms of depression, anxiety and stress is 50.1%, 55.0% and 38.5%, respectively. The magnitude of depressive symptoms in this

Table 3 Severity level of mental health problems of the study participants during COVID-19 pandemic in selected hospitals of Sidama National Regional State, 2020 (n=387)

	Normal (%)	Mild (%)	Moderate (%)	Severe (%)	Extremely severe (%)
Depression	193 (49.9)	47 (12.1)	62 (16.0)	41 (10.6)	44 (11.4)
Anxiety	174 (45.0)	42 (10.9)	41 (10.6)	42 (10.9)	88 (22.7)
Stress	238 (61.5)	42 (10.9)	47 (12.1)	40 (10.3)	20 (5.2)

study was nearly consistent with studies in (Libya 56.3%,²² China (50.4%),²³ Spain (46%),²⁴ Canada (44%)²⁵ and Bangladesh (44%).²⁶ But, other findings from northern Ethiopia (58.2%)¹⁵ and Turkey (76.6%)²⁷ showed higher prevalence of depressive symptoms than our result. And

also, previous results from India (11.4%),²⁸ Singapore (8.9%)¹¹ and Malaysia (21.8%)²⁹ indicated lower prevalence of depressive symptoms. The explanation for the disparity could be due to a simple size difference,

Table 4 Factors associated with symptoms of depression of the study participants during COVID-19 pandemic in selected hospitals of Sidama National Regional State, 2020 (n=387)

Variable	Category	Depression		AOR (95% CI)	COR (95% CI)
		Yes	No		
Age	<25 years	53	58	1	1
	26–35 years	127	118	1.01 (0.65 to 1.59)	0.83 (0.47 to 1.46)
	≥36 years	14	17	2.78 (1.29 to 5.98)*	2.33 (0.84 to 6.50)
Sex	Male	84	143	1	1
	Female	110	50	3.75 (2.44 to 5.75)*	3.71 (2.31 to 5.97)*
Marital status	Single	74	111	1	1
	Married	116	75	2.32 (1.54 to 3.51)*	2.28 (1.34 to 3.86)*
	Divorced	4	7	0.85 (0.24 to 3.03)	0.73 (0.17 to 3.00)
Educational status	Diploma	27	20	2.19 (0.94 to 5.13)	1.18 (0.43 to 3.27)
	BSc degree	151	147	1.67 (0.86 to 3.24)	1.10 (0.50 to 2.42)
	MSc degree	16	26	1	1
Average monthly income	< 7000 ETB	119	114	1.10 (0.73 to 1.65)	0.87 (0.49 to 1.53)
	≥ 7000 ETB	75	79	1	1
Work experience in years	≤5 years	103	127	0.57 (0.28 to 1.18)	1.65 (0.62 to 4.42)
	6–10 years	70	51	0.98 (0.46 to 2.08)	1.66 (0.67 to 4.14)
	≥11 years	21	15	1	1
Living status	With family	114	110	1	1
	Alone	69	74	0.85 (0.34 to 2.13)	1.87 (1.09 to 3.20) *
	With others	11	9	0.76 (0.29 to 1.95)	2.13 (0.73 to 6.17)
Profession	Physician	30	58	1	1
	Nurses	122	75	3.14 (1.86 to 5.32)*	2.94 (1.44 to 5.99)*
	Other professionals†	42	60	1.35 (0.75 to 2.44)	1.46 (0.72 to 2.96)
Working environment	Emergency	78	60	1	1
	Inpatient units	53	67	0.61 (0.37 to 0.99)*	0.53 (0.29 to 0.93)*
	OPD	26	32	0.63 (0.34 to 1.56)	0.79 (0.38 to 1.61)
	Others‡	37	34	0.84 (0.47 to 1.49)	1.00 (0.52 to 1.96)

*P<0.05.

†Public health officers, laboratory, midwives, pharmacists.

‡Delivery, laboratory, pharmacy, ART clinics, TB clinics, etc.

.AOR, adjusted odds ratio; ART, Antiretroviral; BSc, Bachelor of Science ; COR, Crude odds ratio; ETB, Ethiopian Birr; MSc, Master of Science ; OPD, outpatient department.

Table 5 Factors associated with symptoms of anxiety of the study participants during COVID-19 pandemic in selected hospitals of Sidama National Regional State, 2020 (n=387)

Variable	Category	Anxiety		AOR (95% CI)	COR (95% CI)
		Yes	No		
Age	<25 years	58	53	1	1
	26–35 years	136	109	0.98 (0.63 to 1.55)	0.79 (0.45 to 1.39)
	≥36 years	19	12	4.65 (1.91 to 11.36)*	3.15 (1.04 to 6.56)*
Sex	Male	98	129	1	1
	Female	115	45	3.36 (2.18 to 5.19)*	3.25 (2.01 to 5.25)*
Marital status	Single	86	99	1	1
	Married	122	69	2.03 (1.35 to 3.08)*	1.69 (1.01 to 2.87)*
	Divorced	5	6	0.96 (0.28 to 3.25)	0.69 (0.17 to 2.75)
Educational status	Diploma	31	16	1.76 (0.75 to 4.14)	0.90 (0.33 to 2.48)
	BSc degree	160	138	1.05 (0.55 to 2.01)	0.60 (0.28 to 1.30)
	MSc degree	22	20	1	1
Average monthly income	< 7000 ETB	131	102	1.13 (0.75 to 1.69)	0.95 (0.54 to 1.66)
	≥ 7000 ETB	82	72	1	1
Work experience in years	≤5 years	112	118	0.27 (0.12 to 0.62)*	0.81 (0.28 to 2.31)
	6–10 years	73	48	0.43 (0.18 to 1.03)	0.74 (0.27 to 1.99)
	≥11 years	28	8	1	1
Living status	With family	128	96	1	1
	Alone	73	70	0.78 (0.51 to 1.19)	1.55 (0.62 to 2.63)
	With others	12	8	1.13 (0.44 to 2.86)	2.04 (0.69 to 5.95)
Profession	Physician	33	55	1	1
	Nurses	133	64	3.46 (2.05 to 5.85)*	3.32 (1.63 to 6.78)*
	Other professionals†	47	55	1.42 (0.79 to 2.55)	1.41 (0.70 to 2.83)
Working environment	Emergency	77	51	1	1
	Inpatient units	60	60	0.79 (0.48 to 1.29)	0.74 (0.42 to 1.29)
	OPD	30	28	0.85 (0.46 to 1.57)	1.03 (0.50 to 2.12)
	Others‡	46	25	1.46 (0.81 to 2.63)	1.81 (0.91 to 3.61)

*P<0.05.

†Public health officers, laboratory, midwives, pharmacists.

‡Delivery, laboratory, pharmacy, ART (antiretroviral) clinics, TB (tuberculosis) clinics, etc.

AOR, Adjusted odds ratio; BSc, Bachelor of Science; COR, Crude odds ratio; ETB, Ethiopian Birr; MSc, Master of Science; OPD, outpatient department.

a depression diagnostic technique or the research time period.

Similarly, the prevalence of anxiety symptoms in this study was similar to studies in Turkey (60.2%),²⁷ Spain (58.6%)²⁴ and Ethiopia (64.7%).¹⁵ Conversely, the prevalence of anxiety symptoms was higher than the studies conducted in India (17.7%),²⁸ Singapore (14.5%),¹¹ Nepal 38%³⁰ and Ethiopia (26.8%).¹² The disparity could be attributed to differences in the anxiety assessment tool used, the cut-off values used to categorise the outcome and the magnitude of COVID-19. In general, HCPs appear to be suffering from extensive mental health concerns during the COVID-19 epidemic.^{31 32} Both before and after the epidemic, HCPs have a high demand for mental healthcare. The significant prevalence of mental health

problems confirmed with this study and other previous studies^{13–15 33 34} suggests that HCPs in Ethiopia will require mental health and psychosocial support (MHPSS) in the future. Thus, in order to better prevent and control the COVID-19 pandemic, it is necessary to address mental health issues among HCPs.

In addition, the prevalence of stress symptoms was in line with studies in Spain (41.1%)²⁴ and Turkey (41.2%).³⁵ Contrary to this finding higher results were reported in previous studies in different parts of Ethiopia (51.6%–78.3%),^{13–15} Turkey (76.4%)²⁷ and Canada (85.6%).²⁵ The disparity could be due to a difference in sample size, the time the research was conducted, the level of development of health services, or prior experience with comparable pandemics. In general, the degree of mental health

Table 6 Factors associated with symptoms of stress of the study participants during COVID-19 pandemic in selected hospitals of Sidama National Regional State, 2020 (n=387)

Variable	Category	Stress		AOR (95% CI)	COR (95% CI)
		Yes	No		
Age	<25 years	39	72	1	1
	26–35 years	97	148	1.12 (0.69 to 1.78)	0.94 (0.52 to 1.69)
	≥36 years	13	18	2.26 (1.10 to 4.66)*	1.86 (0.71 to 4.88)
Sex	Male	66	161	1	1
	Female	83	77	2.63 (1.72 to 4.01)*	2.47 (1.53 to 3.97)*
Marital status	Single	51	134	1	1
	Married	95	96	2.60 (1.69 to 3.99)*	2.77 (1.60 to 4.78)*
	Divorced	3	8	0.98 (0.25 to 3.86)	1.05 (0.24 to 4.61)
Educational status	Diploma	23	24	2.39 (0.99 to 5.78)	1.23 (0.43 to 3.54)
	BSc degree	114	184	1.55 (0.76 to 3.15)	0.99 (0.43 to 2.28)
	MSc degree	12	30	1	1
Average monthly income	< 7000 ETB	96	137	1.33 (0.87 to 2.04)	1.33 (0.75 to 2.36)
	≥ 7000 ETB	53	101	1	1
Work experience in years	≤5 years	76	154	0.49 (0.24 to 1.00)	0.84 (0.32 to 2.19)
	6–10 years	55	66	0.83 (0.39 to 1.75)	0.99 (0.41 to 2.37)
	≥11 years	18	18	1	1
Living status	With family	87	137	1	1
	Alone	53	90	0.93 (0.60 to 1.43)	2.01 (1.15 to 3.52) *
	With others	9	11	1.28 (0.51 to 3.24)	2.48 (0.86 to 7.18)
Profession	Physician	21	67	1	1
	Nurses	99	98	3.22 (1.83 to 5.66)*	2.34 (1.11 to 4.92)*
	Other professionals†	29	73	1.26 (0.66 to 2.43)	1.32 (0.62 to 2.82)
Working environment	Emergency	71	67	1	1
	Inpatient units	35	85	0.38 (0.23 to 0.65)*	0.32 (0.18 to 0.57)*
	OPD	19	39	0.46 (0.24 to 0.87)*	0.53 (0.25 to 1.10)
	Others‡	24	47	0.48 (0.26 to 0.87)*	0.48 (0.25 to 0.95)*

*P<0.05.

†Public health officers, laboratory, midwives, pharmacists.

‡Delivery, laboratory, pharmacy, ART (antiretroviral) clinics, TB (tuberculosis) clinics, etc.

§

AOR, Adjusted odds ratio; BSc, Bachelor of Science; COR, Crude odds ratio; ETB, Ethiopian Birr; MSc, Master of Science ; OPD, outpatient department.

problems varies greatly between researches, with 27.5%–50.7%, 45% and 18.1%–80.1% of HCPs developing symptoms of depression, anxiety and stress, respectively.³⁶ The use of different scales, the use of diverse testing procedures and methodology in research, as well as the use of different classifications, contribute to widely disparate estimations of the prevalence of mental disorders.³⁷ Thus, HCPs appear to be suffering from extensive mental health concerns during the COVID-19 pandemic. Both during and after the pandemic, HCPs have a high demand for mental healthcare. The significant prevalence of mental health difficulties discovered in this study suggests that HCPs in Ethiopia will require mental healthcare in the future.

Females had higher levels of depression, anxiety and distress in this study which could be attributed to the previously reported gender difference in internalising mental disorders such as anxiety and depression.^{38–39} Burnout, anxiety and depression were all observed to be significantly greater in female responders in earlier investigations as well.⁴⁰ Recent studies on COVID-19 health outcomes in HCPs consistently reveal a large proportion of mental health issues, particularly among women.^{41–43} Furthermore, women were more likely than men to suffer from despair, anxiety and somatisation symptoms as a result of the challenging work environment.⁴⁴ On the one hand, because of the typical culturally bound multiple duties of women in home, child care and skilled

employment, women may have felt the pressure of working in the COVID-19 situation more than their male colleagues.

We also discovered that older employees reported higher levels of anxiety than their younger employees. This could be because the belief that COVID-19 is more serious and complicated in older age groups in the early era of the pandemic. Contrary to our result, recent research on COVID-19 health outcomes indicated, younger doctors have higher levels of insomnia and negative sleep patterns,⁴⁵ as well as higher levels of stress.⁴⁶ In addition, previous research has shown that less experienced HCPs are more prone to emotional distress symptoms than their more experienced counterparts.^{47 48}

In comparison with physicians, our research has indicated that nurses are very likely to suffer from depression, anxiety and stress. Workloads and night shifts in health-care, as well as contact with hazardous patients, enhance the risk of mental distress in nurses.⁴⁹ The nursing staff have more and closer interaction with patients than other professionals, providing round-the-clock care required by patients with COVID-19. As a result, these findings highlight the importance of focusing on nursing staff to identify, treat, and, ideally, avoid anxiety through monitoring and screening.⁴⁴ On the other hand, physicians may have a distinct resistance to somatisation, which can be related to personal accomplishment,⁵⁰ professional experience and self-awareness.⁵¹ Another important reason could be that nurses have more physical contact with patients while providing care than doctors in hospital units.⁵²

Our research found that HCPs who worked in non-emergency units were less likely to develop depression and stress than those who worked in emergency units as reported in previous study.⁴⁴ This may be due to the fact that very polluted and dangerous emergency unit region is the so-called red zone, where most HCPs in front-line operate routinely. Moreover the loss of one patient may have occurred at half of doctors, nurses and technicians due to a pandemic or other medical crisis, including loss of their patients. While the loss of a patient incidence has been demonstrated to be one of the most common sources of stress among HCPs in any medical context notably in emergency departments.^{53 54}

We found out that those HCPs who lived alone had significant levels of depression and stress. Consistent SARS outbreak studies show that the assistance of family and friends plays a significant role in preventing stress.^{55 56} Prior research has shown that good social and family support protects against acute stress and has a positive effect on their overall functioning over time.⁵⁵ During lockdown, it's typical to feel lonely and alienated from others, and regularly communicating with friends and family via video or phone calls can help to boost social support and reduce melancholy and stress.⁵⁷

HCPs who were married were more likely to develop depression, anxiety, and stress in our study. A similar finding was observed in a recent case control investigation of HCWs dealing with the COVID-19 pandemic,

which revealed that married operators had higher levels of stress symptoms than unmarried HCPs.⁵⁸ This could be because married HCPs are concerned about getting exposed to COVID-19 at work and infecting their loved ones and children.

Limitation of the study

There are some limitations to this study. First, depression, anxiety and stress were assessed solely through self-administered questionnaires rather than through a psychiatric interview. Second, because we were unable to meet with HCPs face to face, we were unable to obtain detailed information about psychiatric symptoms history. Finally, this is a cross-sectional study. Longitudinal research on the prevalence of these mental states in the COVID-19 pandemic process is required. Fourth, no information on the type of mental health support received by HCWs could be obtained.

CONCLUSION

To summarise, we wanted to look into the prevalence of mental health issues among HCWs during the COVID-19 pandemic. We revealed that depression, anxiety and stress symptoms were the highly prevalent mental disorders experienced by HCPs. Being female, married, living alone, nurses and working in inpatients were significantly associated with depressive symptoms. Moreover, older age groups, females, married and nurses were more likely to develop symptoms of anxiety. Stress symptoms were significantly high among females, married, living alone, nurses and working in units other than emergency unit (inpatient and other units). Therefore, taking steps to protect the mental health of HCPs is a crucial part of the public health response to the COVID-19 outbreak. Special interventions must be adopted to enhance mental well-being among COVID-19-affected HCPs and to reduce the pandemic's existing mental health consequences such as physical activity, peer support, adequate rest, tea or coffee break during working hours, meditation or religious or spiritual practices. HCPs require mental health-care during and after the pandemic so that monitoring and control may be carried out. Furthermore, it would be preferable if the Ministry of Health and other relevant entities provided MHPSS to HCPs, as well as organising in-service training to promote awareness.

Correction notice This article has been corrected since it first published. 'OVID-19' has been changed to 'COVID-19' at the beginning of the introduction section.

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Ethics approval Ethical approval and clearance were obtained from Hawassa University, College of Medicine and Health Sciences, Institutional Review Board (IRB) with reference number IRB/295/12. The same permission letter was written by the university to each health institution. The purpose of the study was explained for the respondents and consent was obtained. The right to withdraw from the study at any time was assured. Coding was used to eliminate names and other personal identification of respondents throughout the study process to ensure participants confidentiality.

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