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Depression, anxiety, and stress in Health care workers due to COVID-19 pandemic in hospitals of Odisha: A Cross-sectional survey

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ABSTRACT

Background: COVID-19, an unprecedented pandemic significantly affects psychologically healthcare workers (HCWs). The World Health Organization has also announced the pandemic as a Global Public Health Crisis. Priority to observe psychological effects was critical to understanding the various factors and delivering a tailored approach to treatment. This study aims to analyse the prevalence and severity of depression, anxiety, and stress amongst HCWs in Odisha during the pandemic.

Materials and methods: A cross-sectional, observational, questionnaire-based online study was conducted. A total of 300 HCWs participated. The collection of data was done online through a self-administered validated depression, anxiety, and stress (DASS-21) questionnaire designed in Google form. The questionnaire has three sections, consent form, demographic characteristics, and DASS-21. For analysis of categorical variables descriptive statistics, Chi-square test, and Binomial test were used, and for continuous variables, Kruskal Wallis test & Mann-Whitney test were used and '*p*'<0.05 was considered significant.

Results: In this study, respondents were young (63.7%) and the majority were females (61.7%). Doctors constitute 57%, nurses 35%, dentist 17.7% and pharmacists 7% ($p<0.001$). The majority work in non-government sectors ($p<0.001$), having 1-5 years of experience ($p<0.001$). As many as 42.7% of HCWs have depression, 53.7% anxiety, and 13.3% stress. The professional category has a significant association with depression, anxiety, stress, and overall, DAS score ($p<0.01$). Doctors have the highest level of depression, anxiety, stress, and overall, DAS score, followed by nurses, dentists, and pharmacists. Gender played a significant association with anxiety and stress. Females have a significantly higher level of anxiety and stress ($p<0.05$).

Conclusion: The present study revealed a higher proportion of depression, anxiety, and stress in HCWs. Early screening for detecting mental health issues should be initiated for HCWs who are being exposed repeatedly. Hence, group-specific need-based psychotherapy is critical during the pandemic.

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Introduction

The coronavirus disease (COVID-19) pandemic, which originated in the city of Wuhan, China, in December 2019 quickly grappled the whole world and was declared a pandemic by WHO, on March 2020[1] impacting health care workers to a major extent. The disease spread quickly to various countries and as of 22nd June 2022, in India, there were 4.3 crores confirmed cases and 5.25 lakh deaths.[2] Crisis of healthcare resources and fear of exposure led to significant levels of stress, anxiety, and depression. Public Health Emergency of International Concern (PHEIC) like the COVID-19 pandemic can also pose a significant mental health risk to common people of different age groups and other frontline workers. The pandemic was further complicated by unprepared health infrastructure and associated factors like lack of training for infection control and the stigma of getting infected. This situation exposed them to higher stress levels and apprehension. History of any infectious disease like the Ebola outbreak, or HIV pandemic, suggests that even after 1 year of outbreak people continue to experience symptoms of traumatic injury.[3,4]

WHO declared the outbreak of COVID-19 to be a pandemic,[4] with estimates of global mortality at 3.4%. There was panic amongst health care workers (HCWs) which led to stress and anxiety.[5,6] They were the only category who were working under pressure, with long shift times and lack of personal protective equipment (PPE), were in fear of transmitting the infection to their kith and kin and were at risk of self-exposure.[7] Besides the ongoing problem of exposure, avoidance of socializing and lack of coping strategies also bestowed negative effects on their mental health. The COVID-19 outbreak was an unprecedented scenario for many workers across the world. Many studies of healthcare workers in China reported psychological symptoms such as depression in 50%, anxiety in 45%, insomnia in 34%, and mental distress in 71.5%, especially among female nurses and frontline healthcare workers, who were directly involved in the management of patients with COVID-19.[8] A study done in Singapore, related to health care workers found 14.5% positive for anxiety, 8.9% for depression, 6.6% for stress, and 7.7% for clinical concern of post-traumatic stress disorder (PTSD).[9] The HCWs such as doctors, nurses, pharmacists, and other frontline workers were also affected psychologically. This caused personal and family life imbalance, and mental health issues, leading to perpetual depression, anxiety, and stress.[10,11] Due to lockdown, economic instability and shortage of essential medications predisposed them to psychological turmoil. The rising mortality rate has caused a severe negative effect on HCWs.[12,13] Transmission of the disease among HCWs is due to overcrowding, absence of isolation room facilities, environmental contamination, etc. During the COVID-19 pandemic, HCWs played a major role and pushed their limits every day. They bring in the frontline of the system and were bound to take the maximum brunt. The situation was further complicated due to complete uncertainty, unprepared health infrastructure, fear, anxiety, stigma, prejudice, and marginalization toward the disease.

A study in Korea assessed the total impact of the outbreak with Events Scale-Revised. They found that 51.5% had PTSD.[14]. One year after the SARS outbreak, a study found that health care workers that had survived a SARS infection still had elevated stress levels and psychological turmoil.[15] COVID-19 pandemic and post-covid complications have thrown serious challenges to healthcare professionals. This situation exposed them to a higher stress level, anxiety, and apprehension. Moreover, it affects the work output which, might affect the healthcare delivery system. There are few studies done on how COVID-19, affects health care workers' mental health.[16] The rapid escalation of COVID 19 reflected strong emotional stress on populations particularly healthcare workers (HCW) who were confronting huge physical and mental stressors in coping with the demanding crisis.[8]

Similarly, the primary endpoints of the multi-center study amongst healthcare workers in NHS hospitals in Lancashire revealed a marked prevalence of psychological impact such as depression (67%), moderate to severe anxiety (30%), and elevated levels of stress (moderate-severe) (73%) among HCWs during the peak of the Covid-19 pandemic in the region.[17,18]

Hence, the study was undertaken to assess depression, anxiety, and stress in these populations. Knowing the psychological impact of the COVID-19 outbreak among healthcare workers it is imperative to frame and monitor future guidelines for mental health, as well as ensure an optimal health care service. Our aim in this study was to assess the magnitude of impact on health care workers, including depression, anxiety, and stress, with environmental factors, demographic profile, and community stigmatization in different hospitals of Eastern India during the early phase of the pandemic. HCWs were acutely conscious of the infectivity of the virus and were distressed. Therefore, to decrease occupational hazards while commuting to work, after being exposed to the virus, appropriate guidelines should be implemented to reduce stress and anxiety. Occupational distress can be attenuated to some extent by social networking and support from friends, family members, and various healthcare stakeholders.

Materials and methods

Study design

This cross-sectional, observational, questionnaire-based online survey was conducted in November 2021 durin the period of the COVID 19 pandemic among health car workers working in various hospitals, clinics, and healt centers of Odisha, India, conducted by the Department o Pharmacology, IMS & SUM Hospital. The inclusion criteri were health care workers, including all cadres of doctors, nurses, and pharmacists working in tertiary care and variou other hospitals of Odisha, India with a willingness to tak part in the research, male/female, having social media accounts, conversant with the English language. The exclusion criteri for the study were those who responded outside the stud period, were not willing to take part in the research, ha no social media account, and were pilot study participants.

Depression, anxiety, stress-21 item (DASS-21 scale) questionnaire was designed in google form in English, an a link was shared with the WhatsApp group of HCWs. It

was also sent personally to all the HCWs in the contact list of the Investigators. Furthermore, these healthcare workers were requested to forward the link to their contacts (HCWs) i.e. snowballing sampling. The internal consistency reliability of the scale was acceptable to high, with a Cronbach Alpha of 0.72 for depression, 0.77 for anxiety, 0.70 for the stress subscale, and 0.88 for the overall scale.[18] The questionnaire has three sections: informed consent, demographic details, and DASS -21. The Likert scale was used to measure the response. The prevalence of depression, stress, and anxiety among the HCWs was analysed along with the factors responsible for the same.

The HCWs who clicked the link were directed to the first page of the google form, which contains information about the study. On providing the consent to take the survey and completing the questionnaire, participants were directed to click the submit option and the responded questionnaire was sent to google drive. Data retrieved from the online survey was entered into Microsoft Excel.

Sample size and study duration

The sampling was determined through the formula n (*minimum sample size*)=$z^2_{1-\alpha/2}$ $P(1-P)/d^2$. Where, $z^2_{1-\alpha/2}$= value of the standard normal variant for 95% CI and p=0.5 (anticipated population proportion) and d=0.6 (absolute precession on either side of the population proportion). The minimum sample size was computed as 266. However, the archived sample size was 300. The study duration was 15 days.

Study population

Health care workers in different hospitals in Odisha, India were permitted to be associated with this research. Demographic data analysed in the study population were age, gender, location, job category, working environment, and experience in years.

Questionnaire and data collection

A pilot study was done on 20 HCWs to validate the questionnaire. The pilot study data were excluded from the main analysis. The questions were organized in google forms, link was generated and shared with the participants. The link was also shared personally with HCWs who are on the contact list of the investigators. On clicking the link, the first page contains the study objectives, procedure, confidentiality agreement, voluntary participation, and consent to participate in the study. Identification information of the participants was not recorded anywhere in the questionnaire. Participants could withdraw from the study if they so desired at any point of time. Missing data was minimized by requesting the participants to answer all the questions in a section before proceeding to the next section. The participant's consent to participate in the study by clicking on the next button which takes them to the questionnaire on demographic characteristics. The participant has to answer all the questions in each section to proceed to the next section. Finally, the participant has to click on the submit button to submission of the form to google drive. The Snowball sampling method was followed.

Instruments

The online survey using the DASS-21 questionnaire is frequently used to assess depression, anxiety, and stress. A score of 0 to 3 in the past 1 week was analysed for each participant. The final score is multiplied by two to obtain the cumulative score. Each of the three sub-scales: (DASS21-D), Anxiety (DASS21-A), and Stress (DASS21-S) has seven items. Each item comprises a statement and four short response options to reflect the severity and scored from 0 (Did not apply to me at all) to 3 (Applied to me very much, or most of the time). To yield equivalent scores to the full DASS 42, the total score of each scale is multiplied by two[5] and ranges from 0 to 42.[19]

Data processing and statistical analysis were undertaken by using IBM SPSS Statistics version 24.0. The severity of DAS was classified according to normal, mild, moderate, severe, and very severe based on the score given in the result tables. Descriptive statistics procedure, non-parametric Chi-square test, and Binomial test were used for the analysis of categorical variables. Kruskal Wallis test & Mann-Whitney test was performed for comparing continuous variables. Cut-off value p<0.05 was considered to indicate statistical significance.

Ethical approval

The participants were assured that their responses to the online questionnaire would remain anonymous. The research was approved by the Ethical Committee of IMS and SUM Hospital: Ref. No /DRI/ IMS.SH/SOA/2021/036.

Results

The sample respondents were predominantly young with 63.7% in the 21-30 years and 15.3% in the 31-40 years age group (p<0.001). The majority of respondents were females (61.7%) (p<0.001) and the urban area had more than the 4/5th share in the sample (83%). Among the respondents, the maximum of nearly 2/5th were doctors (40.3%), 1/3rd of nurses (35%), 1/6th of dentists (17.7%), and 7% of pharmacists (p<0.001). The majority were working in non-government sectors (81.7%) (p<0.001). The majority were having 1-5 years (59%) of experience (p<0.001). None were taking medication for depression, anxiety, and stress. About 9% and 7.3% were taking medication for diabetes and hypertension respectively (Table 1).

Table 1 Participants' socio-demographic characteristics (n=300).

Variable	Classification	No.	%	*p* value
Age in years	21-30	191	63.7	*p*<0.001*
	31-40	46	15.3	
	41-50	32	10.7	
	> 50	31	10.3	
Gender	Female	185	61.7	*p*<0.001#
	Male	115	38.3	
Location	Rural	51	17	*p*<0.001#
	Urban	249	83	
Job Category	Doctors	121	40.3	χ^2=85.547 *p*<0.001*
	Dentist	53	17.7	
	Nurses	105	35	
	Pharmacist	21	7	
Working	Govt.	55	18.3	*p*<0.001#
	Non Govt.	245	81.7	
Experience (years)	1-5	177	59	χ^2=93.140 *p*<0.001*
	6-10	47	15.7	
	>10	76	25.3	
Are you taking medications for anxiety/stress?	Yes	0	0	
	No	300	100	
Are you taking medications for depression?	Yes	0	0	
	No	300	100	
Are you taking medications for diabetes?	Yes	27	9	
	No	273	91	
Are you taking medications for hypertension?	Yes	22	7.3	
	No	278	92.7	

***Note**: #binomial p value, *non-parametric Chi-square p value, Govt: government.*

Overall, 42.7% of the health care workers were having depression (depression score ≥10). About 1/5th were having mild (18.4%), with scores (of 10-13), and moderate (19.3%), with scores of 14-20, a form of depression. Only 5% had a severe or very severe form of depression with a score ≥21. More than half (53.7%) of the health care providers were having anxiety (anxiety score ≥8). Nearly 1/10th was mild (12.3%), with scores 8-9, and 28.3% moderate, with scores 10-14, a form of anxiety. Little more than 1/10th had severe or very severe (13.3%), a form of anxiety with a score ≥15. In comparison to depression and anxiety, a relatively less proportion was under stress with a prevalence of 13.3% with a stress score of ≥15 (Table 2).

The depression score has a mean±SD of 8.7±6.8 and median (1st quartile Q1-3rd quartile: Q3) 8 (4-12). The mean±SD of the anxiety score was 8.8± 6.6 and the median (Q1-Q3) was 8 (4-12). Similarly, the mean±SD of the stress score was 9.4±5.8, and the median (Q1-Q3) was 8 (4-12). The mean±SD and median (Q1-Q3) of the total DAS score were 26.9±16.2 and 24 (18-34) respectively. The individual and overall DAS scores did not have a significant association with age, experience, location, and working place (p>0.05). The professional category has a significant association with depression, anxiety, stress, and overall DAS score (p<0.01). Doctors have the highest level of depression, anxiety, stress, and DAS score. Nurses followed by the dentist came next in order. Pharmacists were the least affected. Gender also played a significant association with anxiety and stress and overall DAS score. Females have a significantly higher level of anxiety and stress (p<0.05) (Table 3).

Table 4 presents a comparison of mean±SD, median (Q1-Q3) of depression, anxiety, and stress with medication. Health caregivers who are taking medication for diabetes did not have a significant association with depression, anxiety, stress and overall DASS. Medication taken for hypertension did not have a significant association with depression, stress and overall DASS (p>0.05) but have a significantly higher anxiety level with median (IQR) 10 (7.5-14) with p=0.039.

Table 2 Table 2 DASS 21 subscale severity ratings.

Depression	No.	%
Normal (0-9)	172	57.3
Mild (10-13)	55	18.4
Moderate (14-20)	58	19.3
Severe & very severe (21+)	15	5
Anxiety		
Normal (0-7)	139	46.3
Mild (8-9)	37	12.3
Moderate (10-14)	84	28
Severe & very severe (15+)	40	13.3
Stress		
Normal (0-14)	260	86.7
Mild (15-18)	27	9
Moderate (19-25)	12	4
Severe & very severe (26+)	1	0.3
Total	300	100

Table 3 Comparison of depression, anxiety, and stress scores with Socio-demographic variables.

Age group	N	Depression		Anxiety		Stress		Total DAS	
		Mean±SD	Median (IQR)	Mean±SD	Median (IQR)	Mean±SD	Median (IQR)	Mean±SD	Median (IQR)
21-30	191	8.7±7.5	6 (4-14)	8.8±6.9	8 (4-12)	9.4±6.1	10 (6-14)	26.8±17.7	22 (16-34)
31-40	46	9.5±6.5	10 (3.5-12.5)	9.0±6.3	9 (4-12)	10±5.3	10 (6-14)	28.5±14.7	27 (21.5-36.5)
41-50	32	8.2±4.6	8 (4-11.5)	7.3±4.4	8 (4-10)	9.4±5.3	10 (6-13.5)	24.8±11.5	24 (18-32)
>50	31	8.7±4.5	8 (4-14)	9.7±6.6	8 (6-12)	9.2±5.3	10 (6-12)	27.6±12.7	28 (18-36)
Kruskal Wallis Test *p* value			0.558		0.522		0.844		0.414
Job Category									
Doctors	121	9.7±4.9	10 (4-14)	9.4±6.2	8 (4-14)	10.1±6.0	10 (6-14)	29.3±13.8	30 (20-38)
Dentist	53	8.0±8.7	6 (0-12)	7.1±7.6	6 (2-10)	8.5±7.7	8 (2-14)	23.5±22.6	22 (6-33)
Nurses	105	8.7±7.8	6 (2-12)	9.5±6.6	8 (4-12)	9.9±4.2	7 (10-12)	28±15.1	22 (20-32)
Pharmacist	21	5.4±3.6	4 (2-9)	5.7±3.3	6 (3-8)	5.1±3.2	6 (2-8)	16.2±7.8	18 (8-23)
Kruskal Wallis Test *p* value			*p*<0.001		*p*<0.001		*p*<0.001		*p*<0.001
Experience (Years)									
1-5	177	8.9±7.5	6 (4-14)	8.5±6.8	6 (4-12)	9.4±6.1	10 (6-14)	26.8±17.6	22 (16-34)
6-10	47	9.4±6.9	8 (4-14)	10.4±7.0	8 (6-14)	10.3±5.5	10 (6-14)	30.1±16.2	30 (20-38)
>10	76	8.0±4.6	8 (4-12)	8.3±5.5	8 (4-12)	8.8±5.2	8 (6-12)	25.1±12.2	24 (18-32)
Kruskal Wallis Test '*p*' value			0.736		0.119		0.429		0.368
Gender									
Female	185	9.1±7.0	8 (4-14)	9.5±6.5	8 (4-12)	9.8±5.0	10 (6-14)	28.4±14.9	24 (20-36)
Male	115	8.0±6.5	8 (4-12)	7.6±6.6	6 (2-12)	8.7±6.9	8 (2-12)	24.5±17.9	20 (12-32)
Mann-Whitney U's *p* value			0.311		0.010		0.026		0.010
Location									
Rural	51	8.3±7.7	4 (2-12)	7.8±7.3	6 (4-12)	10.1±7.4	10 (4-14)	26.2±20.2	22 (16-34)
Urban	249	8.0±6.6	8 (4-12)	9.0±6.4	8 (4-12)	9.2±5.4	10 (6-12)	27.1±15.3	24 (18-35)
Mann-Whitney U's *p* value			0.315		0.065		0.584		0.255
Working									
Govt	55	8.5±4.8	8 (4-12)	8.0±6.8	6 (4-12)	9.5±6.0	10 (6-14)	26.1±14.6	24 (16-36)
Non-govt	245	8.8±7.2	8 (4-14)	8.9±6.5	8 (4-12)	9.4±5.8	10 (6-13)	27.1±16.6	24 (18-34)
Mann-Whitney U *p* value			0.489		0.240		0.899		0.857
Total	300	8.7±6.8	8 (4-12)	8.8±6.6	8 (4-12)	9.4±5.8	10 (6-14)	26.9±16.2	24 (18-34)

Table 4 Comparison of depression, anxiety, and stress score with medication taken.

Variables	N	Depression		Anxiety		Stress		Total DAS	
		Mean±SD	Median (IQR)	Mean±SD	Median (IQR)	Mean±SD	Median (IQR)	Mean±SD	Median (IQR)
Are you taking medications for Diabetes?									
Yes	27	7.9±5.3	8 (4-10)	9.4±6.4	10 (4-14)	9.2±5.9	10 (4-12)	26.4±14.0	26 (18-36)
No	273	8.8±6.9	8 (4-14)	8.7±6.6	8 (4-12)	9.4±5.8	10 (6-14)	27.0±16.4	24 (17-34)
Mann-Whitney U's *p* value			0.704		0.437		0.988		0.804
Are you taking medications for Hypertension?									
Yes	22	8.9±5.2	9 (4-12)	11.3±6.5	10 (7.5-14)	11.3±5.0	10 (9.5-13)	31.5±3.4	29 (23.5-36)
No	278	8.7±6.9	8 (4-14)	8.6±6.5	8 (4-12)	9.2±5.8	10 (6-14)	26.5±16.4	23 (16-34)
Mann-Whitney U's p value			0.505		0.039		0.104		0.067

The classification of depression, anxiety, and stress into positive screening was done with a cut-off score of >13, >9, and >18 respectively. These cut off were decided considering moderate, severe & very severe categories of depression, anxiety and stress level. There was no significant association between the positive screening of depression, anxiety, and stress scores with age groups (p>0.05). The professional category had a significant association with the positive screening of depression, anxiety, and stress (p<0.05). Doctors had the highest proportion of positive screening for depression, anxiety, and stress i.e, 52.1%, 48.8%, and 20.7% respectively, followed by nurses for depression (40.0%) and anxiety (42.9%). Positive screening of dentists for depression (34%) and anxiety (30.2%) which is lower than that of a nurse. Pharmacists have the lowest proportion of positive screening (Table 5).

Table 5 Comparison of depression, anxiety, and stress scores with Socio-demographic variables.

Age in years	Screening of Depression		Screening for Anxiety		Screening for Stress	
	Negative (≤13)	Positive (>13)	Negative (≤9)	Positive (>9)	Negative (≤18)	Positive (>18)
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
21-30	118 (61.8%)	73 (38.2%)	115 (60.2%)	76 (39.8%)	168 (88%)	23 (12%)
31-40	21 (45.7%)	25 (54.3%)	23 (50%)	23 (50%)	37 (80.4%)	9 (19.6%)
41-50	17 (53.1%)	15 (46.9%)	22 (68.8%)	10 (31.3%)	28 (87.5%)	4 (12.5%)
> 50	16 (51.6%)	15 (48.4%)	16 (51.6%)	15 (48.4%)	27 (87.1%)	4 (12.9%)
χ^2 (p)	4.756 (0.191)		3.590 (0.309)		1.846 (0.605)	
Job Category						
Doctors	58 (47.9%)	63 (52.1%)	62 (51.2%)	59 (48.8%)	96 (79.3%)	25 (20.7%)
Dentist	35 (66%)	18 (34%)	37 (69.8%)	16 (30.2%)	45 (84.9%)	8 (15.1%)
Nurses	63 (60%)	42 (40%)	60 (57.1%)	45 (42.9%)	98 (93.3%)	7 (6.7%)
Pharmacist	16 (76.2%)	5 (23.8%)	17 (81%)	4 (19%)	21 (100%)	0 (0%)
Total	172 (57.3%)	128 (42.7%)	176 (58.7%)	124 (41.3%)	260 (86.7%)	40 (13.3%)
χ^2 (p)	9.370 (0.025)		9.869 (0.020)		13.034 (0.005)	

Discussion

The COVID19 pandemic has been correlated with the psychological impact among HCWs who are dealing at the forefront. Depression, anxiety, and stress symptoms were manifested during the pandemic. In the study by Amal M. Qasem Surrati *et. al*, depression, anxiety, and stress (DAS) are 27.9%, 35.5%, and 72% in HCWs respectively, whereas in our study DAS is found to be 42.7%, 53.6%, 13.3% respectively. Hence in our study, we could find a higher percentage of depression and anxiety among healthcare workers, particularly doctors and nurses which could be due to long hours of work, high exposure to the virulent pathogen, and associated high mortality.[20]

Another recent study by Al Ateeq *et al.* (2020) reported depressive disorder (55.2%) and anxiety disorder 51.4% similar to our study.[21] Gupta A K *et al*. reported depression and anxiety at 8% and 37.3% respectively amongst the Nepalese health workforce.[22] In contrast to our study in which a higher percentage of HCWs reported having depression and anxiety. In the current study, overall health care workers were having depression scores≥10. About 1/5th were having mild (18.4%), with scores (of 10-13), and moderate (19.3%),

with scores of 14-20, forms of depression. Only 5% had a severe or very severe form of depression with a score ≥21. More than half (53.7%) of the health care providers were having anxiety (anxiety score ≥8). Nearly 1/10th HCWs have mild anxiety (12.3%), with scores of 8-9, and 28.3% moderate, with scores of 10-14, the form of anxiety. Little more than 1/10th had severe or very severe (13.3%), a form of anxiety with a score ≥15. In comparison to depression and anxiety, relatively fewer proportions were under stress with a prevalence of 13.3% with a stress score of ≥15.

The individual and overall, DAS score did not have a significant association with age, experience, location, and working place (p>0.05). The professional category has a significant association with depression, anxiety, stress, and overall, DAS score (p<0.01). Doctors have the highest level of depression, anxiety, stress, and DAS score. Nurses followed by dentists came next in order. Pharmacists have the least score. Gender also played a significant association with anxiety and stress and overall DAS score. Females have a significantly higher level of anxiety and stress (p< 0.05) which was similar to the study done by Preethi Selvaraj *et al*, but in the study by Chatterjee SS *et al*, female HCWs had less depression, stress, and anxiety.[23,14]

Eman Alnazly *et al*. reported depression at 40%, anxiety at 60%, and stress at 35%. Depressive, anxiety and stress scores were 21.30±10.86, 20.37±10.80, and 23.33±10.87 respectively.[24] Current study reported a similar percentage for depression and anxiety but lesser severity for stress. The depression score was 8.7±6.8 and median (1st quartile Q1-3rd quartile: Q3) 8 (4-12). The anxiety score was 8.8±6.6 and the median (Q1-Q3) was 8 (4-12). The stress score was 9.4±5.8 and the median (Q1-Q3) was 8 (4-12). The mean±SD and median (Q1-Q3) of the total DAS score were 26.9±16.2 and 24 (18-34) respectively. The individual and overall DAS scores did not have a significant association with age, experience, location, and working place (p>0.05). The professional category has a significant association with depression, anxiety, stress, and overall DAS score (p<0.01). Doctors have the highest level of depression, anxiety, stress, and DAS score. Nurses followed by the dentist came next in order. Pharmacists were the least affected. Gender also played a significant association with anxiety and stress and overall DAS score. Females have a significantly higher level of anxiety and stress, unlike that reported by Eman Alnazly *et al*, where males, married, aged 40 years and older, having more clinical experience were suffering from psychological distress.

Preethi Selvaraj *et al* study revealed median (IQR) of 5.0 (2.0-8.0) for depression,6.0 (2.0-10.0) for anxiety and 3.0(1.0-8.0) for stress in females.[23] Our study reported 8(4-14), 8(4-12), and 10(6-14) for depression, anxiety, and stress respectively. A Korean study revealed 27% of depression during the respiratory syndrome outbreak whereas in our study it was 42.7% during the COVID19 pandemic.[25] This emphasizes that the HCWs have experienced severe mental exhaustion during this time of uncertainty. Similar results were deciphered from studies in China.[26-29]

The present study reveals that HCWs who are taking medication for diabetes did not have a significant association with depression, anxiety, stress, and overall DASS. Medication taken for hypertension did not have a significant association with depression, stress, and overall DASS (p>0.05) but have a significantly higher anxiety level with a median (IQR) 10(7.5-14) with p=0.039. whereas Chaterjee S S *et al* study showed that 5.9% of HCWs had major comorbidities like diabetes, hypertension, and COPD.[16]

Therefore, we can de-escalate the associated stress and anxiety by screening and providing tailor-made psychological support.[30]

Conclusion

High levels of depression, stress, and anxiety were observed in our study. Over half of HCWs had significant depression, and anxiety, and less than 30% had stress regardless of age. This was especially more pronounced in females for both stress as well as anxiety. A structured guideline on pandemic management may reduce the cognitive dissonance among HCWs and their overall psychological well-being.

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Conflicts of interest

There is no conflict of interest.

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Author Contributions

All the authors contributed to the conduct of the study. The conceptualization of the study was done by MB, DM, and DM, and MB contributed to the methodology of the study.SM, TM, and SP were responsible for the statistical analysis. DM, MB, TM, SM, SP, and SSM contributed to the manuscript review and editing.

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