

Assessment of depression, anxiety and stress experienced by health care and allied workers involved in SARS-CoV2 pandemic

Saket Shekhar, Shamshad Ahmad, Alok Ranjan, Sanjay Pandey, Arshad Ayub, Pragma Kumar

Community and Family Medicine Department, All India Institute of Medical Sciences, Patna, Bihar, India

ABSTRACT

Introduction: The novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV2) causing coronavirus disease 2019 (COVID-19) has led to a global health crisis. Health workforce has been working vigorously in COVID-19 management. So, we have planned this study with an aim to assess the psychological profile of healthcare and allied workers involved in SARS-CoV2 pandemic and to look for associated factors. **Methodology:** A cross-sectional observational study was planned at All India Institute of Medical Sciences, Patna. Study population comprised of Health care workers and allied health care workers involved in COVID-19 management. **Results:** Data from 254 study participants have been included in the study. The prevalence of severe and extremely severe depression among study participants was 8.3 and 3.1 percent. Severe and extremely severe anxiety prevalence was found to be 9.4 and 13.8 percent. The prevalence of severe and extremely severe stress was 2.4 and 2.4 percent each. Education till post-graduation, unmarried, occupation of doctor, Comorbidity of headache and occurrence of influenza-like illness in last 3 months had a statistically significant association with high depression score. With high Anxiety score and high-stress score statistically significant association was seen in education till postgraduation, unmarried, occupation of doctor, duration of 1 COVID-19 duty of ≥ 8 hours. **Conclusion:** The study highlights high psychological comorbidities in the form of depression, anxiety and stress among health care workers and allied health care workers working in COVID-19 pandemic. Prevalence of psychological morbidity is higher among doctors compared to nurses and allied health workers. COVID-19 duty of ≥ 8 hours have been found to be hampering mental health.

Keywords: Anxiety, COVID-19, depression, health personnel, psychological, stress COVID-19

Introduction

The novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV2, which started in Wuhan province of China in late 2019, has spread to all countries throughout the world. As

of October 26, 2020, a total of 42 million confirmed cases of COVID-19 along with 1.1 million deaths has been reported to WHO worldwide.

The novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV2) causing coronavirus disease 2019 (COVID-19) has led to a global health crisis. Healthcare workforce is a team of doctors, nurses and allied health professionals. Health workforce has been working vigorously in COVID-19 management. Healthcare workforces are working in emergency mode in the

Address for correspondence: Dr. Arshad Ayub, Department of Community and Family Medicine, AIIMS, Phulwarisharif, Patna, Bihar, India. E-mail: drarshadayubcommmed@gmail.com

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present COVID-19 times.^[1] They are at high risk of infection and also may later transmit this disease to their family members.^[2] These factors might precipitate psychological stress among healthcare staff.^[3,4] The literature search revealed that HCWs who are working in screening clinic, emergency departments, intensive care units, and isolation wards have a higher risk of developing adverse psychiatric outcomes than those of other departments, possibly because they are directly or indirectly exposed to the potential infected patients, and their work is highly demanding.^[5,6]

These psychiatric problems have been found to vary from depression, anxiety, panic attacks, somatic symptoms, and posttraumatic stress disorder symptoms, to delirium, psychosis and even suicidal tendency.^[7,8] There is a paucity of study reporting about psychological assessment of healthcare workers who are working for management of SARS-CoV-2 in Indian scenario. So, we have planned this study with an aim to assess the psychological profile of healthcare and allied workers involved in SARS-CoV2 pandemic and to look for associated factors.

Material and Methods

Study design, setting and population

A cross-sectional observational study was planned at All India Institute of Medical Sciences, Patna. Study population comprised of Health care workers and allied health care workers involved in COVID-19 management.

Eligibility criteria

Inclusion criteria for the study were all health care workers and allied health workers involved in emergency services during COVID-19 during the last 3 months. Health care and allied health workers who exclusively worked in routine services not related with COVID-19 as well as those who were on leave for 30 or more days in this period were excluded.

Sample size and sampling method

Assuming prevalence of anxiety to be 45% from a recent study done at J Lai at China, 95% confidence interval and 5% absolute precision in finite population of health care workers 974, a sample size of 273 is obtained. Sampling frame was prepared using duty rosters obtained from hospital's administration. Sampling method used in the study was simple random sampling using sampling frame. List of random numbers was generated with help of open epi software.

Ethics approval

Written informed consent was obtained from all participants and the study was approved by the institutional review board, in accordance to the principles in the Declaration of Helsinki.

Study questionnaire

Study questionnaire was semi-structured in nature. It collected various baseline characteristics like age, gender, marital status,

education, occupation, working area, years of experience, number of COVID-19 duties in a month, duration of one COVID-19 duty, information about comorbidities. Data was also obtained regarding seven stressors that were identified in the literature review. Psychological assessment for Depression, anxiety and stress was done using DASS-21 scale.

DASS-21 scale

The Depression, Anxiety and Stress Scale - 21 Items (DASS-21) is a set of three self-reported scales designed to measure the psychological states of depression, anxiety and stress. DASS-21 is comprised of 21 questions.^[9] A set of 7 questions is dedicated to each of depression, anxiety and stress. The depression scale assesses feelings of dysphoria, hopelessness, devaluation of life, self-deprecation, loss of interest. The anxiety scale measures autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxiousness. The stress scale is useful in assessing levels of chronic non-specific arousal. It measures difficulty in relaxing, nervous arousal, and being easily upset, irritable or over-reactive and impatient. Four options on Likert scale are present for each question. Scores for depression, anxiety and stress are calculated by adding the scores for the relevant items. Scores on the DASS-21 will need to be multiplied by 2 to calculate the final score. The reliability of DASS-21 shows excellent Cronbach's alpha values of 0.81, 0.89 and 0.78 for the subscales of depressive, anxiety and stress respectively. Score of 0-9,10-13,14-20,21-27 and 28 and above on depression scale were categorized to be normal, mild, moderate, severe and extremely severe depression respectively. A score on anxiety scale of 0-7, 8-9,10-14,15-19 and 20 and above were categorized as normal, mild, moderate, severe and extremely severe anxiety respectively. In stress scale a score of 0-14,15-18,19-25,26-33 and 34 and above were categorized as normal, mild, moderate, severe and extremely severe stress respectively. The scale was translated in Hindi. Hindi version was back translated in English by a different person. Back translated English version was compared with original DASS -21 for consistency. Prior to starting the study Hindi version DASS-21 was pilot tested on 15 individuals to check for comprehensibility of questionnaire.

Data collection

A prior telephonic conversation was made with each study participant explaining aim and objectives and method of the study. A google form was created to collect above-mentioned data. The link for the google form was then circulated to study sample through what's app group.

Statistical analysis

Data analysis was done on SPSS 21. Baseline variables that are categorical in nature has been presented in percentage. Continuous variables have been presented in mean or median and standard deviation or interquartile range. A Mann-Whitney *U* test was used to analyse differences between two groups of nonnormally distributed data. Spearman correlation was assessed between the three psychological scores.

Results

Data from 254 study participants have been included in the study. 19 study participants did not respond even after 3 intimations. So, non-response rate was 6.9 percent. Most of non-responders were allied health care workers. Mean age of study participants was 29.4 years. Males constituted two-third of study participants. More than half of study participants were educated till post-graduation. Doctors constituted more than half of study participants. Median year of working experience was 3 years. Almost half of study participants were married. Median number of COVID-19 duties per month was found to be 14. Median duration of a single COVID-19 duty was found to be 8 hours. Presence of various comorbidities has been reported in [Table 1].

The prevalence of severe and extremely severe depression among study participants was 8.3 and 3.1 percent [Table 2]. The median score of depression among study participant was 10 (IQR: 6-14). Severe and extremely severe anxiety prevalence was found to be 9.4 and 13.8 percent. The median score of anxiety was 8 (IQR: 2-14). The prevalence of severe and extremely severe stress was 2.4 and 2.4 percent each represented in [Table 2]. The median stress score was found to be 4 (IQR: 2-10).

When asked about reason of stress presently, the most common stressor reported by study participants was doing COVID-19 duties working PPE to be very exhausting by one-third. Other stressors included fear of being infected, need of COVID-19 related training, rapid access to testing as presented in [Table 3].

Education till post-graduation, unmarried, occupation of doctor, Comorbidity of headache and occurrence of influenza-like illness in last 3 months had a statistically significant association with high depression score. With high Anxiety score statistically significant association was seen in education till postgraduation, unmarried, occupation of doctor, duration of 1 COVID-19 duty of equal to or greater than 8 hours and influenza-like illness in last 3 months. High-stress score was found a statistically significant association with education till post-graduation, unmarried, occupation of doctor and duration of 1 COVID-19 duty equal to greater than 8 hours [Table 4].

Correlation was assessed between depression, anxiety and stress scores. High positive statistically significant correlation was found between each 2 score [Table 5].

Discussion

The study was a facility-based cross-sectional study exploring prevalence of depression, anxiety and stress among health care workers and allied health care workers and their determinants. In our study, the overall prevalence of depression, anxiety and stress among health care workers using DASS-21 scale was found to be 60.2, 50.4 and 13 percent respectively. The prevalence of severe and extremely severe depression was found to be 8.3 and

Table 1: Baseline characteristics of health care workers (n=254)

Characteristics	n (%)
Gender	
Male	168 (66.1%)
Female	86 (33.9%)
Age in years (Mean, SD)	29.4,5.5
Education	
Matriculation	10 (3.9%)
Intermediate	11 (4.3%)
Graduation	87 (34.3%)
Postgraduation	146 (57.5%)
Occupation	
Doctor	141 (55.5%)
Nurse	72 (28.3%)
Allied health care worker	41 (16.1%)
Occupation experience median year (IQR)	3 (1-6)
Marital Status	
Married	128 (50.4%)
Others	2 (0.8%)
Unmarried	124 (48.8%)
Number of Covid duties per month median (IQR)	14 (11.5-16)
Duration of 1 Covid duty median (IQR)	8 (6-8)
Hypertension	8 (3.1%)
High Cholesterol	13 (5.1%)
Skin disease	12 (4.7%)
Headache	57 (20.9%)
Diabetes	2 (0.8%)
Influenza like illness in last 3 months	90 (35.4%)
Mean depression score (SD)	11.13 (7.37)
Median depression score (IQR)	10 (6-14)
Mean Anxiety score (SD)	9.6 (8.9)
Median Anxiety score (IQR)	8 (2-14)
Mean stress score (SD)	7 (8.0)
Median stress score (IQR)	4 (2-10)

Table 2: Depression, Anxiety and stress prevalence among Healthcare and allied healthcare workers (n=254)

	Depression	Anxiety	Stress
Normal	101 (39.8%)	126 (49.6%)	221 (87.0%)
Mild	67 (26.4%)	19 (7.5%)	14 (5.5%)
Moderate	57 (22.4%)	50 (19.7%)	7 (2.8%)
Severe	21 (8.3%)	24 (9.4%)	6 (2.4%)
Very severe	8 (3.1%)	35 (13.8%)	6 (2.4%)
Total	254 (100%)	254 (100%)	254 (100%)

3.1 percent respectively. Severe anxiety and extremely severe anxiety were found in 9.4 and 13.8 percent whereas severe stress and extremely severe stress was found in 2.4 percent each. It is evident from the result that there has been high psychological morbidity among healthcare worker and allied workers working in COVID-19 pandemic. Fortunately, severe and very severe psychological morbidity requiring medical requirement is much less than mild to moderate forms. Chew *et al.*^[10] in their multinational study among 906 health care workers to assess psychological morbidity among healthcare workers in COVID-19 pandemic reported prevalence of very severe depression, very severe anxiety and very severe stress was 5.3,8.7 and 3.8 percent

Table 3: Reason for main stress among health care professionals (n=254)

Stressor	Doctors	Nurses	Health care worker
Doing COVID-19 duties wearing PPE is very exhausting	47 (33.3)	25 (34.7)	14 (34.1)
Fear of getting infected	40 (28.4)	27 (37.5)	8 (19.5)
There should be training regarding COVID-19 pandemic	13 (9.2)	7 (9.7)	5 (12.2)
There should be rapid access to testing for health care workers	11 (7.8)	5 (6.9)	3 (7.3)
No support for emotional or psychological needs	11 (7.8)	3 (4.2)	4 (9.6)
Feedback from healthcare professional should be part of decision-making	10 (7.1)	4 (5.6)	5 (12.2)
No provision for child care needs	5 (3.5)	2 (2.8)	2 (4.9)
Lodging for individual on a rapid cycle shift	4 (2.8)	4 (5.6)	0 (0)

Table 4: Association between psychological scores and various demographic variable

	Depression score Median (IQR)	P	Anxiety Median (IQR)	P	Stress Median (IQR)	P
Gender		0.368		0.359		0.067
Male	10 (10)		8 (12)		4 (8)	
Female	10 (10)		8 (10)		4 (10)	
Age		0.772		0.440		0.754
≤30	10 (10)		6 (12)		4 (10)	
>31	10 (8)		8 (10)		4 (6)	
Education		0.010		0.00		0.012
Upto graduation	10 (10)		4 (12)		4 (8)	
postgraduation	12 (10)		10 (10)		6 (10)	
Marital status		0.042		0.027		0.009
Married	10 (8)		6 (11.5)		4 (8)	
Unmarried	10 (10)		8 (13.5)		5 (12)	
Occupation		0.018		0.00		0.003
Allied health worker	10 (10)		4 (12)		2 (8)	
Nurse	9 (10)		10 (13)		3 (6)	
Doctor	12 (12)		6 (10)		6 (10)	
Year of experience		0.677		0.695		0.736
<2	10 (10)		6 (12)		4 (8)	
≥2	10 (10)		8 (11.5)		4 (8)	
Number of covid duties per month		0.195		0.766		0.144
<15	10 (8)		8 (13)		4 (10)	
≥15	12 (10)		8 (10)		4 (8)	
Duration of one covid duty in hours		0.094		0.043		0.005
<8	10 (9.5)		6 (10)		4 (8)	
≥8	12 (6.5)		11 (12.5)		5 (10.5)	
Hypertension		0.110		0.791		0.546
Yes	14 (22)		7 (30)		4 (8)	
No	10 (8)		8 (12)		4 (26.5)	
High Cholesterol		0.061		0.298		0.326
Yes	12 (6)		14 (11)		6 (7)	
No	10 (8)		6 (12)		4 (9)	
Headache		0.018		0.099		0.033
Yes	14 (10)		8 (12)		6 (13)	
No	10 (8)		6 (12)		4 (8)	
Skin disease		0.717		0.295		0.259
Yes	10 (8.5)		5 (7.5)		2 (4)	
No	10 (8)		8 (12)		4 (8)	
Influenza like illness in last 3 months		0.027		0.039		0.247
Yes	12 (10)		8 (14)		4 (12)	
No	10 (10)		6 (10)		4 (8)	

using same DASS-21 scale respectively. Wilson *et al.*^[11] reported prevalence of stress, depression and anxiety which require intervention in their study among 350 health care workers to be 3.7, 11.4 and 17.7 percent using GAD-7 scale respectively.

In another study by An Ying *et al.*,^[12] the overall prevalence of depression among 1103 ED Nurses in COVID-19 pandemic using 9 item patient health questionnaire was found to be 43.61 percent. Another study By Gupta Simmi *et al.*^[13] among 769 armed

Table 5: Correlation between depression, anxiety and stress scores

	Depression score	Anxiety score	Stress score
Depression score			
Spearman correlation	1.0	0.711	0.628
<i>P</i>		0.000	0.000
Anxiety score			
Spearman correlation		1.00	0.829
<i>P</i>			0.000
Stress score			
Spearman correlation			1.0
<i>P</i>			

forces doctors working in COVID-19 reported Prevalence of depression and anxiety using Hospital and anxiety scale (HADS) to Be 28.2 and 35.2 percent. More recent studies are in line with our findings.^[14,15] So, it can be concluded Health care workers and allied health care workers who have been working tirelessly in the pandemic are suffering from high magnitude of psychological morbidities. Almost one-tenth having severe to very severe psychological morbidity among them require immediate intervention which can be in form of counselling with or without medications.

In our study, we enquired about reason of stress from health care workers. Almost one-third of them reported about doing duties wearing PPEs to be very exhausting and almost an equal number reported about concern of getting infected and transmitting the disease to family. Other reasons cited by health care workers was related to training regarding COVID-19 pandemic, no rapid access to testing, no support for emotional needs, no feedback from health care professionals, no provision for child care needs and problems of lodging for individual on a rapid cycle shift. Our findings are in line with findings of A. Shechter *et al.*^[16] who reported major stressors to be uncertain clinical status, lack of control, contracting COVID-19, transmitting COVID-19 to family, lack of testing etc.

In our study, we found that High depression score had a statistically significant association with doctors among health care workers, higher education till post-graduation, Unmarried marital status. Similarly, high anxiety score had a statistically significant association with doctors, higher education till post-graduation, unmarried marital status and working hours equal to or more than 8 hours per day. High-stress scores had a statistically significant association with doctors among health care workers, high education till post-graduation, unmarried married status and duration of one COVID-19 equal to greater than 8 hours a day. J Chan *et al.*^[17] reported a similar association of anxiety with increased workload and respiratory symptoms. Another study by Simmi Gupta *et al.*^[13] reported anxiety to be associated with age group of 20–35 years, female gender, less than 10 years duration of service and non-clinical branches. Depression was found to be associated with young age group, non-clinical branch, duration of service less than 10 years

and doctoral degree. Wilson *et al.*^[11] in their study reported high stress to associated with female gender, depression and anxiety to be associated with female gender and staying at hostel. None of these studies have compared psychological morbidities with exact occupational profile of health care workers. Higher level of psychological morbidities associated with doctors compared to other health care workers can be attributed to the fact doctors have been involved in making treatment decisions. Treatment decisions is a tough task since treatment guidelines have evolved during the last few months. Unmarried marital status was found to be associated with psychological morbidities. This association can be explained on the basis that married people are with family so they have partners to whom they can explain their concerns. Association of anxiety and stress with 8 or greater duration of COVID-19 duty can be because of requirement of PPE use in the duty hours. Association of depression and anxiety with influenza-like illness in last 3 months could be due to the fact that occurrence of respiratory symptom might have created a situation of panic that they might acquire COVID-19 infection. Difference in association of another demographic variable as compared to other studies could be due o fact that the workforce at the hospital is of young age group since the hospital has started working eight years back.

Our study had few limitations. Non-response from few allied health workers was found. Study design being cross-sectional is not very suitable for assessing causality since temporality of association cannot be checked. The strength of the study lies in its robust methodology, validated questionnaire converted in local vernacular. The study was conducted when the disease was its peak infectivity in the region.

Conclusion

The study highlights high psychological comorbidities in the form of depression, anxiety and stress among health care workers and allied health care workers working in COVID-19 pandemic. Prevalence of psychological morbidity is higher among doctors compared to nurses and allied health workers. COVID-19 duty of greater than 8 hours has been found to be hampering mental health. Recent respiratory health problems have been found to be associated with higher depression and anxiety scores.

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Conflicts of interest

There are no conflicts of interest.

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