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Impact of Covid-19 Pandemic on Mental Health of Health Care Workers from a Tertiary Care Teaching Hospital of Northern India: A Cross-Sectional Study

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Abstract

Objectives: To assess the prevalence of depression, anxiety and stress (DAS) and post-traumatic stress disorder (PTSD) among health care workers

Methods: The present study was conducted over a period of six months (June 2020-November 2020) during which mental health status of health care workers was assessed using semi-structured self-reporting study tool which included two standardized and validated tools (DASS-21 and IES-R). Sociodemographic profile and occupational history were also recorded. Health care workers of all categories who gave a written informed consent were recruited using non probability convenience sampling technique. Minimum sample size required was this study was calculated to be 440, using 4PQ/L2 where, power was assumed to be 80%, absolute precision of 5%, and P as 50%, after adding non-response rate of 10%. Data was compiled and analyzed using EpiInfo07 software.

Results: Out of a total of 822 participants included in the study, 12%,13% and 16% were found to have symptoms of depression, anxiety, and stress with the odds being higher in females. The prevalence of PTSD was 18%. Those with education above intermediate and directly involved in COVID 19 related work and patient care were found to be at higher risk of depression, anxiety, stress and posttraumatic stress disorder.

Conclusions: There is a need for a psychological support system for health care workers along with appropriate administrative action to ensure shift rotation, rest and appropriate working hours. Further, in-depth knowledge of prevention and control of the disease is necessary.

Keywords: COVID-19, Stress, Anxiety, Depression, Post-traumatic stress disorder, Health care workers

Introduction

COVID-19 was first reported in December 2019 from China which spread rapidly to other countries and it was declared a public health emergency of international concern by WHO on 30/01/2020 and a pandemic on 11/03/2020.[1,2] First case from India was reported on 27/1/2020.[3] Whereas, Punjab reported its index case on 09/01/2020.[4]

Since then, the number of cases increased putting an overwhelming load on health care workers (HCW). For control, lockdowns were imposed country-wide and it resulted in economic slowdown adding to psychological distress of population.[5]

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The morbidity and mortality due to COVID-19 increased and HCWs are facing an uphill task in providing services. Increased risk of contracting the disease due to the work environment as well as innate desire for a positive outcome in every patient also acts as stressor in HCWs.[6-8] Increasing stress levels decrease the immunity thereby increasing the risk of contracting the disease which also stands true for COVID-19.[9]

The disease course and outcome due to COVID-19 is associated with uncertainty and low predictability. This impacts the mental health of the patients and caregivers, but rates of poor mental health have been higher among HCWs.[10,11] The rates are even higher among frontline workers in comparison to non-frontline HCWs which has not been explored. It is essential to understand the mental health effects of the disease in order to counter them and ensure good mental health.[12-14]

Available literature shows that poor coping, maladjustment and emotional disturbances have also risen due to the pandemic.[15,16] This highlights the fact that not only physical but mental and social health also need to be taken care of.[17]

In view of this, the present study was carried out to assess the prevalence of depression, anxiety and stress (DAS) and post-traumatic stress disorder (PTSD) among HCWs of our institution with the aim of understanding their mental health status and needs.

Materials & Methods

This cross-sectional study was conducted over a period of six months (June 2020 to November 2020) in the Department of Community Medicine, Government Medical College, Amritsar, Punjab, India. Being a tertiary care institute, it acted as a state referral centre for seven districts (Amritsar, Gurdaspur, Jallandhar, Hoshiarpur, Pathankot, Kapurthala & Tarn Taran}.

Staff members who gave a written informed consent were included in the study. Any study participant with a known history of psychiatric illness, intake of oral drugs causing mood disorders, alcohol dependence or illicit drug use was excluded from the study.

Assuming power of study to be 80% and an absolute precision of 5%, sample size was calculated using N= (Za/2)2 (P[1-P])/ d2, where P was taken to be 50% for attaining maximum sample size; therefore, it was planned to recruit a minimum of 440 participants after adding a non- response rate of 10% to the calculated sample size of 400. Non-probability convenience sampling technique was used to enroll the study participants.

The semi-structured, self-reporting study tool was used which consisted of three sections.

Section I: Sociodemographic details (age, gender, educational status, marital status and living with family) and occupational details (department, whether directly involved in COVID-19 related work or not).

Section II: DAS-21 scale consisted of 21 items to assess the symptoms of DAS on a likert scale (ranging from 0-3) with 7 items each allotted to one subscale (3X7=21). After adding item specific scores for each subscale, they were multiplied by 2 to get final scores. The cut offs and the degree of severity for each subscale was taken as per standards.[18]

Section III: IES-R scale, which is a 22 item scale used for recording PTSD, where each item is assessed on a likert scale (0 to 4); three subscales namely, intrusion (8 items), avoidance (8 items) and hyperarousal (6 items) are also assessed. Total score ranged from 0-88, where 24 was the cut-off while any individual having a score of 33-38 was considered to be suffering from PTSD, while those with scores between 24-32 had partial or some symptoms of PTSD whereas, those with scores of >39 suffered from a severe form of PTSD.[19]

After developing it was pilot tested for assessing its completeness, sentence formation, punctuation, instructions, linguistic quality and aptness of duration required for filling the questionnaire. This assessed face validity of the tool before it could be used in the study.

Methodology

Training sessions on COVID-19 were organized for the staff of medical college during which data collection was done. The participants were explained about the objectives of study and were asked to fill in the most appropriate responses for each item of the scales. They were requested not to leave any question blank as that would lead to exclusion of the study participant.

Data analysis/ statistical analysis

Primary outcome for the present study was psychological problems in terms of DAS and PTSD among HCWs.

The data were compiled and analyzed using EpiInfo07 (CDC, USA) software. Mean ± standard deviation was calculated for continuous variables. For categorical variables frequency and proportions were calculated. Univariate logistic regression was used to establish association between presence of DAS and PTSD with various sociodemographic and occupational variables. Linear regression was used to assess association between predictor variables and mean scores of IES-R subscales. $p < 0.05$ on both sides was considered to be statistically significant.

Findings

A total of 822 participants were included in the study where most of them (748;91%) were aged between 31 to 60 year and their mean age± standard deviation was 49.9±9.9 years. Females (457;56%) were slightly higher than males (365;44%). Majority were diploma holders (355;43%). 13% (110/822) and 10% (85/822) had education up to graduation and post-graduation level whereas, only 2% (16) were illiterate. Most (713;87%) were married. Faculty formulated 8% (62/822) of the participants and majority were staff nurses (43%). 35% (286/822) were involved in COVID-19 related work.

Out of 822 study participants 96 (12%), 107 (13%) and 120 (16%) were found to be having symptoms of DAS. The mean score of DAS 21 was 5.3±8.2 ranging from 0-57. As far as mean subscale scores were concerned, stress had the highest mean score (mean ±SD =4.8±6.9; range=0-38), followed by depression (mean ±SD =3.1±5.9; range=0-40) and least was for anxiety (mean ±SD =2.6±4.9; range=0-38).

The grading as per the severity of DAS is shown in figure 1.

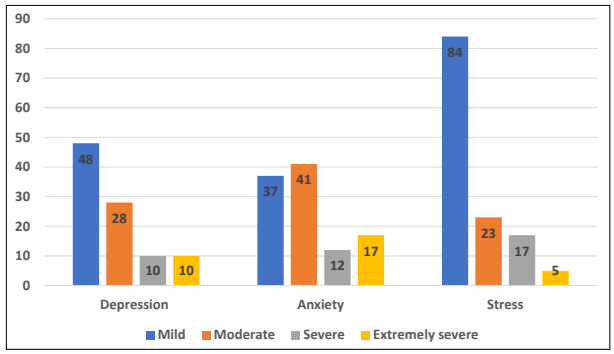

Figure 1: Distribution of study participants according to severity of Depression, Anxiety & Stress

The prevalence of PTSD was found to be 18% (146/822) among the study participants. The distribution according to the severity of PTSD is shown in figure 2.

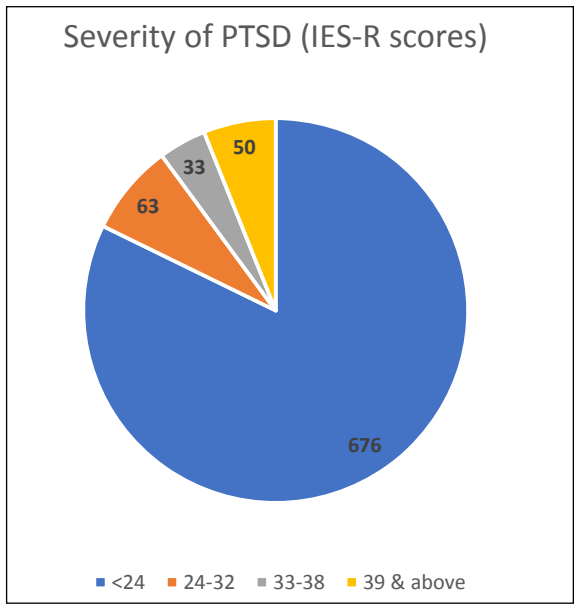

Figure 2: Distribution of study participants according to severity of PTSD (IES-R scores)

Females were at 2.5 times higher odds of suffering from depression (OR= 2.51; 95% CI =1.55-4.04) and anxiety (OR= 2.52; 95% CI =1.59-3.98) as well as 2.94 times higher odds of suffering from stress (OR= 2.94; 95% CI =1.92-4.54) (table 1). Having an education of more than intermediate (OR=4.95; 95% CI=2.88-8.52) were found to be strongly related to PTSD.

Table 1: Univariate logistic regression analysis showing association of depression, anxiety, stress and PTSD with sociodemographic profile of HCWs

Variable	Stress		Anxiety		Depression		PTSD	
	Yes (n=129)	No (n=693)	Yes (n=107)	No (n=715)	Yes (n=96)	No (n=726)	Yes (n=146)	No (n=676)
Sex								
Female	98 (21%)	358 (79%)	79 (17%)	377 (83%)	71 (16%)	386 (84%)	111 (24%)	346 (76%)
Male	31 (8%)	335 (92%)	28 (8%)	338 (92%)	25 (7%)	340 (93%)	35 (10%)	330 (90%)
OR (95% CI)	2.94 (1.92-4.54)		2.52 (1.59-3.98)		2.51 (1.55-4.04)		3.03 (2.01-4.56)	
Education								
≥ 12th grade	105 (19%)	445 (81%)	91 (17%)	459 (83%)	80 (15%)	470 (85%)	130 (24%)	420 (76%)
< 12th grade (reference)	24 (9%)	248 (91%)	16 (6%)	256 (94%)	16 (6%)	256 (94%)	16 (6%)	256 (94%)
OR (95% CI)	2.44 (1.52-3.90)		3.17 (1.82-5.51)		2.72 (1.56-4.76)		4.95 (2.88-8.52)	
Marital status								
Married	113 (16%)	600 (84%)	96 (13%)	617 (87%)	86 (12%)	627 (88%)	135 (19%)	578 (81%)
Unmarried/ (reference)	16 (15%)	93 (85%)	11 (10%)	98 (90%)	10 (9%)	99 (91%)	11 (10%)	98 (90%)
OR (95% CI)	0.91 (0.52-1.61)		0.72 (0.37-1.39)		0.74 (0.37-1.46)		2.08 (1.11-3.49)	
Staying with family								
Yes	121 (16%)	652 (84%)	100 (13%)	673 (87%)	90 (12%)	683 (88%)	136 (18%)	637 (82%)
No (reference)	18 (16%)	41 (84%)	17 (14%)	42 (86%)	6 (12%)	43 (88%)	10 (20%)	39 (80%)
OR (95% CI)	1.05 (0.481-2.29)		1.12 (0.49-2.56)		1.05 (0.44-2.56)		1.12 (0.58-2.46)	

Being directly involved in COVID-19 related work and working in clinical department were found to be associated with DAS. Strength of association is shown in table 2.

Table 2: Univariate logistic regression showing association of depression, anxiety, stress and PTSD with occupational profile of HCWs

Variable	Stress		Anxiety		Depression		PTSD	
	Yes (n=129)	No (n=693)	Yes (n=107)	No (n=715)	Yes (n=96)	No (n=726)	Yes (n=146)	No (n=676)
Department								
Clinical	96 (18.6%)	434 (82%)	88 (17%)	442 (83%)	62 (15%)	356 (85%)	117 (22%)	413 (78%)
Non- Clinical (reference)	33 (11%)	259 (89%)	19 (7%)	273 (93%)	34 (80%)	370 (92%)	29 (10%)	263 (90%)
OR (95% CI)	1.74 (1.14-2.65)		2.86 (1.70-4.8)		1.89 (1.22-2.95)		2.5 (1.7-3.9)	

Variable	Stress		Anxiety		Depression		PTSD	
	Yes (n=129)	No (n=693)	Yes (n=107)	No (n=715)	Yes (n=96)	No (n=726)	Yes (n=146)	No (n=676)
Involved in COVID-19 related work								
Yes	91 (32%)	195 (68%)	69 (24%)	217 (76%)	66 (23%)	220 (77%)	97 (34%)	189 (66%)
No (reference)	38 (7%)	498 (93%)	38 (7%)	498 (93%)	30 (6%)	506 (94%)	49 (9%)	487 (91%)
OR (95% CI)	6.11 (4.05-9.24)		4.17 (1.97-6.41)		4.17 (1.97-6.41)		5.1 (3.48-7.47)	

The factors found to be associated with avoidance, hyperarousal and intrusion (IES-R subscales) were age group, sex and involvement in COVID-19 related work (table 3).

Table 3: Linear regression analysis showing various factors associated with avoidance, hyperarousal and intrusion.

Variable	Avoidance	Hyperarousal	Intrusion	Total
	MEAN ± SD	MEAN ± SD	MEAN ± SD	MEAN ± SD
Age group				
>18-30	0.5±0.7	0.3±0.5	0.3±0.5	8.71±10.45
31-40	0.7±0.8	0.6±0.7	0.4±0.6	12.85±14.14
41-50	0.6±0.7	0.5±0.6	0.4±0.6	11.38±12.93
51-60	0.7±0.8	0.6±0.7	0.6±0.7	14.07±14.84
>60	0.4±0.6	0.2±0.6	0.2±0.5	6.05±11.54
	p=0.06	p=0.000	p=0.001	P=0.005
Sex				
Male	0.46±0.65	0.34±0.52	0.29±0.49	15.77±14.82
Female	0.87±0.8	0.69±0.74	0.59±0.68	8.15±11.18
	p=0.000	p=0.000	p=0.000	P=0.000
Marital status				
Married	0.7±0.8	0.6±0.7	0.5±0.6	12.76±14.14
Separated/widowed/divorced/single	0.6±0.7	0.4±0.6	0.3±0.5	9.93±11.49
	p=0.2	p=0.03	p=0.1	P=0.01
Involved in Covid-19 related work				
Yes	1.1±0.9	0.8±0.8	0.8±0.7	19.93±15.83
No	0.5±0.6	0.4±0.5	0.3±0.5	8.36±10.67
	p=0.000	p=0.000	p=0.000	P=0.000
Staying with family				
Yes	0.7±0.8	0.5±0.7	0.5±0.6	13.2±17.4
No	0.6±0.8	0.6±0.8	0.6±0.8	12.3±13.6
	p=0.35	p=0.84	p=0.89	P=0.60

Discussion

The current study was conducted to assess the prevalence of psychiatric morbidity among HCWs and explore the factors associated with it. The overall prevalence of depression, anxiety and stress was found to be 12%, 13% and 16% in our study which was lower than the range of prevalence rates of depression (12.2%-50.4%), anxiety (13.0%-44.6%) and stress (29.1%-71.5%) among HCWs reported from different parts of the world.[10,20-22] This lower prevalence could be explained by the fact that our study was not

conducted during the peak of COVID-19 outbreak and lockdown imposed was also partially removed.

Among those having symptoms related to DAS, 10%, 16% and 4% had extremely severe symptoms whereas majority had mild symptoms (48%, 35% and 65%) which were similar to the results reported by a multicentric study conducted in India and Singapore.[23,24] PTSD was found to be 18% (146/822) as all had experienced a pandemic situation and complete lockdown for the first time in their lives.

Female gender, having intermediate & above education, working in clinical and para clinical departments were found to be associated with increased risk of having DAS and PTSD. Further being involved in COVID-19 related work (clinical care, diagnostics, data management etc) had a very strong association with having DAS symptomology. A study conducted in China, also reported that females and frontline workers were at higher risk of having DAS during COVID-19 pandemic.[25]

Females generally take care of the family, which increases the fear of transmitting the infection to family members and if they get infected they will be unable to perform their day-to-day duties for them. These factors push them to a higher risk of having DAS and PTSD.

Those involved in COVID-19 related work were at significantly higher odds of suffering from DAS and PTSD. This can be attributed to long working hours and lack of rest. Continuous exposure increases their chances of contracting COVID-19 and they fear of taking infection home and spreading infection to their loved ones. Apprehension arising because of non-availability of PPE, proper sanitation and required equipment contributes to the negative feelings which increases levels of DAS.[25,26]

Therefore, the administration needs to configure appropriate working hours, periodic rest phases and rotation for all the workers during the COVID-19 pandemic peak. This highlights the need of prioritising safety of HCWs and fulfilment of their basic needs. Further a provision of psychological support through colleagues, social media platforms and workshops should be organised to enhance the ability to cope with emotional challenges.[26,27]

Having higher education was found to be associated with higher risk of psychiatric morbidity. This is because they have in-depth knowledge about disease which further adds to the fear of morbidity and mortality associated with the disease if they contract the same.

Organisation of COVID-19 related training for enhancement of their occupational competency can go a long way in relieving the stress and increasing job confidence.

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Conflict of interest: None

Ethical Clearance: Ethical clearance of the current study was obtained from Institutional Ethical Committee vide letter number GMC/Principal/IEC/2020/GMCIEC02049 dated 25/6/2020

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