Original Research Article

A study of the evaluation of Perceived Stress, Depression and Anxiety amongst Covid-19 patients in a tertiary care hospital

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ABSTRACT

Background: COVID-19 is a significant health crisis affecting the world and at its heart are the HCWs treating the patients. However, only a few studies in India have addressed the potential effect on the mental health of HCWs. Thus, we decided to find the prevalence of Perceived Stress, Depression, and Anxiety of the Paramedical (PHCW) and Medical (MHCW) Healthcare Workers doing Covid Duty and correlate it with the duty related parameters.
Methodology: In a Tertiary Care Covid Hospital, we conducted a cross-sectional study of 203 HCWs (PHCWs & MHCWs) assessed socio-demographic & duty-related variables, stress by PSS, Depression by PHQ-9, and Anxiety by HAM-A after obtaining informed consent.
Results: Amongst the 203 HCWs,75.3% have significant perceived stress. 34% have mild to severe depression which is 3-4 times more than the general population. 7.88% of HCWs have anxiety. PHCWs have significantly more anxiety (11.88%) as compared to MHCWs (3.92%) doing COVID duty. In duty related parameters, PHCWs working >=6 weeks have high stress (45.54%) and depression (24.75%) as compared to MHCWs. Despite doing duty in a stable ward, PHCWs have significantly high stress (39.60%) and depression (19.8%) as compared to MHCWs. MHCWs have significantly high Stress (48.03%) and depression (16.67%) while doing duty in both (ICU and ward) as compared to PHCWs.
Conclusion: Both PHCWs and MHCWs have a high prevalence of perceived stress and depression, with a significant difference due to duty-related Parameters - long duration and place of duty.

Key words: Healthcare Workers, Perceived Stress, Anxiety, Depression

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INTRODUCTION

COVID-19 crisis has affected the entire world since it was declared a pandemic by WHO [1]. The people working tirelessly to bring the medical crisis under control since the onset of the epidemic are the healthcare workers. Apart from the physical exertion of wearing PPE and long working hours, they also have to face variable duty schedules, make ethically difficult decisions and fear contracting and spreading the infection [2]. Also, as per the study by Mohinder and others [3] worries of family members back home, risk of infection of friends and relatives, Hospital isolation, and hostility from society tests the resilience of HCWs. According to previous studies, during the outbreaks of Severe Acute Respiratory Syndrome (SARS) and the Middle East Respiratory Syndrome (MERS), frontline medical staff had reported high levels of stress that resulted in posttraumatic stress disorder (PTSD) [4].

According to a recent study in Wuhan [5], that assessed mental Health outcomes in HCWs in 20 hospitals, 50.4% reported depression and 44.6% reported anxiety. Also in India, a study [6] reported high-level Perceived stress in 3.7% of Health Care Professionals working during the COVID 19 outbreak in April. Since HCWs are especially vulnerable to mental health problems, including anxiety and depression under high levels of stress [7], we felt that their mental angst needs to be put into surveillance and interventions for controlling it need to be taken. Thus, we chose Medical (MHCWs) and Paramedical Healthcare Workers (PHCWS) as our study population and aimed to assess and compare perceived stress amongst them, to assess and compare depression amongst them, to assess and compare the level of anxiety between them, to assess the impact of socio-demographic variables on perceived stress, depression, and anxiety and to assess the impact of duty-related parameters on perceived stress, depression, and anxiety amongst medical and paramedical health care workers.

METHODOLOGY

Study design and Participants

A cross-sectional study was carried out in a tertiary care hospital functioning as a COVID care center after approval from the Institutional Review Board during the month of June 2020. All consenting healthcare workers who had performed their duties for COVID-19 positive patients for at least 15 days were included. A total of 203 Paramedical and Medical Professionals were included. All Non-Consenting HCWs and those who had contracted or recovered from COVID infection were excluded.

Measurements

Both the groups, i.e. MHCWs and PHCWs were evaluated on the following parameters

1. Socio-demographic parameters like age, gender, marital status, education, religion, family type, and locality and clinical parameters like history of medical/psychiatric illness and addictions.
2. Duty Related parameters like number of days spent, days since the last COVID duty and its site.

There were 3 stress rating scales –

1. **Perceived Stress Scale (PSS):** This is a 10 item self-rated scale with Cronbach's alpha 0.78 [8]. It is a subjective scale with Scores 0-13 as low stress, 14-26 considered moderate stress 27-40 considered high perceived stress.
2. **Patient Health Questionnaire-9 (PHQ-9):** This is a scale to predict the presence and severity of depression. It is a 9 item self-reported questionnaire with score 0-27 and PHQ-9 score ≥10 had a sensitivity of 88% and a specificity of 88% for major depression. PHQ-9 scores of 5, 10, 15, and 20 represented mild, moderate, moderately severe, and severe depression, respectively [9].
3. **Hamilton Anxiety Rating Scale (HAM-A):** It is a 14 question objective scale for screening and assessing severity of anxiety with reliability as alpha=0.77 to 0.92 [10]. It is a 14-item questionnaire with 14-17 = Mild Anxiety 18-24 = Moderate Anxiety 25-30 = Severe Anxiety.

STATISTICAL ANALYSIS

Statistical analysis was done using IBM SPSS Statistics for Windows, version 20, Armouk, NY, USA [11]. Descriptive statistical analysis was used for Socio-demographic, Clinical, Duty related Parameters, PSS, PHQ-9 and HAM-A. Proportions were used for discrete variables. Suitable parametric/non-parametric tests were applied for finding significant statistical differences.

RESULTS

A total of 203 consenting participants -101 PHCWs and 102 MHCWs (all Resident Doctors) were included.

Sociodemographic and Clinical Parameters

According to table 1 showing Socio-demographic and clinical parameters, Most of PHCWs were Male (54.45%), >27 years old (50.49%) , married(54.45%), Graduate(64.35%), living in nuclear family (73.26%) in Urban Area (61.38%). MHCWs predominantly consisted of single(93.13%),male (63.72%), <27 years old (90.19%), graduates (100%), of a joint family (63.73%) living in urban area(96.07%), Majority participants refused for addiction(97.02% PHCWs and 98.03%MCWs) had no History of psychiatric illness(98.01% and 99.02%) and no History of Medical illness (PHCWs 97.02 and MHCWs 94.11%).

Table 1: Comparison of Sociodemographic and Clinical Parameters between Paramedical Health care workers and Medical Health care workers doing duty in COVID Positive Admitted Patients

Sociodemographic & Clinical Parameters		Paramedical Health care workers (n=101)	Medical Health care workers (n=102)
Age (years)	< = 27 years	50 (49.50%)	92 (90.19%)
	>27 years	51 (50.49%)	10 (9.80%)
Gender	Male	55 (54.45%)	65 (63.72%)
	Female	46 (45.54%)	37 (36.27%)
Marital status	Single	46 (45.54%)	95 (93.13%)
	Married	55 (54.45%)	7 (6.86%)
Education	Graduate	65 (64.35%)	102 (100%)
	Post Graduate	36 (35.64%)	0
Locality	Urban	62 (61.38%)	98 (96.07%)
	Rural	39 (38.61%)	4 (3.92%)
Family Type	Nuclear	74 (73.26%)	28 (27.45%)
	Joint/Extended	36 (35.64%)	65 (63.73%)
Addiction	Smoking/Other substances	3 (2.97%)	2 (1.96%)
	No	98 (97.02%)	100 (98.03%)
History of Psychiatric Illness and Treatment Taken	Yes	2 (0.02%)	1 (0.98%)
	No	99 (98.01%)	101 (99.02%)
History of Medical Illness	Yes	3 (2.97%)	6 (5.88%)
	No	98 (97.02%)	96 (94.11%)

Duty Related Parameters

According to Table 2, showing Duty Related Parameters, 92.07% PHCWs and 93.13% MHCWs had performed Covid duty less than 7 days ago. 63.36% PHCWs compared to 24.51% MHCWs had spent more than 6 weeks doing Covid work with a significant difference of <0.0001. Also a similar result, (p Value= <0.00001) was found with 57.54% MHCW working in both ICU and ward, while 51.48% PHCWs had worked in a stable ward.

Table 2: Comparison of Duty Related parameters between PHCWs and MHCWs Doing duty in COVID Positive Admitted patients

Duty Related Parameters		Medical Health Care Workers (n=101)	Paramedical Health Care Workers (n=102)		Significance
Last covid Duty before	< = 7 days	93 (92.07%)	95 (93.13%)	0.083	0.773247 Not Significant
	>7 days	8 (7.92%)	7 (6.86%)		
No of days spent in covid duty	> = 6 weeks	64 (63.36%)	25 (24.51%)	32.5667	<0.00001 Significant*
	4-6 weeks	23 (22.77%)	38 (37.25%)		
	2-4 weeks	14 (13.86%)	39 (38.24%)		

Duty in	ICU	27 (26.73%)	18 (17.64%)	28.1645	<0.00001 Significant*
	Stable ward	52 (51.48%)	25 (24.50%)		
	Both	22 (21.78%)	59 (57.84%)		

*p value < 0.05 is considered statistically significant.

Table 3: Prevalence and comparison of Perceived stress among PHCWs and MHCWs Doing duty in COVID Positive Admitted patients

	Paramedical Health care workers (n=101)	**Medical Health care workers (n=102)**	**Chi Square**	**P value and significance**
Low Perceived stress (0-13)	28 (27.72%)	22 (21.56%)	1.0354	0.308903 Not Significant
Moderate- high Perceived	73 (73.73%)	80 (78.43%)		

According to Table 3, After assessing Perceived stress in PHCWs and MHCWs, 73.73% PHCWS and 78.43% MHCWS had moderate - high levels of Perceived stress (p value 0.308903, Not Significant)

Table 4. Prevalence and comparison of Depression (PHQ-9) among PHCWs and MHCWs Doing duty in COVID Positive Admitted patients

	Paramedical Health care workers (n=101)	**Medical Health care workers (n=102)**	**Chi Square test**	**P value and significance**
No- Minimal Depression (0-4)	62 (62.39%)	72 (70.59%)	1.9153	0.166375
Mild- severe Depression (5-27)	39 (38.61%)	30 (29.41%)		Not Significant

According to table 4. Showing Prevalence of Depression, 34% HCWs (38.61% PHCWs and 29.41% MHCWs were found to suffer from mild- severe Depression. This is 3-5 times more than the general population [12]

Table 5: Prevalence and comparison of Anxiety (HAM-A) among PHCWs and MHCWs Doing duty in COVID Positive Admitted patients

	Paramedical Health care workers (n=101)	**Medical Health care workers (n=102)**	**Chi Square**	**P value and significance**
No Anxiety (0-13)	89 (88.12%)	98 (96.08%)	4.4283	0.035347 Significant *
Mild- Severe (>14)	12 (11.88%)	4 (3.92%)		

**p value < 0.05 is considered statistically significant.*

According to table 5, Mild to Severe Anxiety was Prevalent among 7.88% of HCWs. PHCWs have significantly (p value= 0.035347) more anxiety (11.88%) as compared to MHCWs (3.92%) doing Covid Duty.

Table 6: Correlation of Moderate - high Perceived stress and Duty Related parameters amongst PHCWs and MHCWs Doing duty in CoVID + Admitted patients

Variables	Paramedical Health care workers (n=101)	Medical Health care workers (n=102)	Chi Square	P value and significance
Last Covid Duty Before	Moderate-high Perceived Stress (14- 40)	Moderate-high Perceived Stress (14- 40)	1.20	0.272391 Not Significant
<= 7 days	66(65.35%)	76(74.51%)		
>7 days	7(6.93%)	4 (3.92%)		
Number of days spent in covid duty > = 6 weeks	46(45.54%)	20(19.60%)	22.9009	0.000011 Significant*
4-6 weeks	17(16.83%)	33(32.35%)		
2-4 weeks	10(9.90%)	27(26.47%)		
Duty in ICU	17(16.83%)	14(13.72%)	26.0592	<0.0001 Significant*
Stable ward	40(39.60%)	17(16.67%)		
Both	16(15.84%)	49(48.03%)		

Table 7: Correlation of Presence of Mild- Severe Depression (PHQ-9) with the Duty Related Variables amongst PHCWs and MHCWs Doing duty in COVID positive admitted patients

Variables	Paramedical Health care workers (n=101)	Medical Health care workers (n=102)	Chi Square	P value and significance
Last Covid Duty Before	Mild- Severe Depression (>4)	Mild- Severe Depression (>4)		
<= 7 days	36(35.64%)	27(26.47%)	0.1137	0.73593 Not Significant
>7 days	3(2.97%)	3(2.94%)		
Number of days spent in covid duty > = 6 weeks	25(24.75%)	8(7.84%)	9.9756	0.006821 Significant
4-6 weeks	8(7.92%)	10(9.80%)		
2-4 weeks	6(5.94%)	12(11.76%)		
Duty in ICU	9(8.91%)	5(4.90%)	7.0465	0.29503 Not Significant
Stable ward	20(19.80%)	8(7.84%)		
Both	10(9.90%)	17(16.67%)		

According to Table 6, Showing Correlation of High levels of Perceived stress, Mild- severe Depression, and Mild - severe Anxiety with duty related parameters, after completing >=6 weeks in Covid duty 45.54% PHCWs had moderate to high levels of perceived stress as compared to 19.60% of MHCWs with a significant difference of P value - 0.000011. According to the place of duty, 48.03% MHCWs working both in ICU and ward had moderate to high Perceived stress which was significantly (P value <0.0001) higher than PHCWs (15.84%). 69.95% of HCWs (65.35% PHCWs and 74.51%MHCWs) who had completed their duties within the last 7 days or were still on duty suffered from moderate - high levels of perceived stress.
According to table 7, 35.64% PHCWs and 26.47%MHCWs with depressive symptoms had been doing duty/had completed duty within the last 7 days. 24.75% of PHCWs who had done duty for more than equal

to 6 weeks had depressive symptoms as compared to 7.84% MHCWs, P value- 0.006821. 16.67% MHCWs with duty in both ICU and ward and 19.80% PHCWs with stable ward duty had depression.

Table 8: Correlation of Mild Anxiety and Duty Related parameters amongst PHCWs and MHCWs Doing duty in COVID positive admitted patients

Variables	Paramedical Healthcare Workers (N=101)	Medical Healthcare Workers (N=102)	Chi Square	P value and significance
Last Covid Duty Before	**Moderate- high Perceived stress (14- 40) Mild - Severe Anxiety (>14)**	**Moderate- high Perceived stress (14- 40) Mild - Severe Anxiety (>14)**		
<= 7 days	11 (10.89%)	4 (3.92%)	0.0187	0.891305 Not Significant
>7 days	1(0.99%)	0		
Number of days spent in covid duty > = 6 weeks	1(0.99%)	1 (0.98%)	0.8	0.67032 Not Significant
4-6 weeks	3 (2.97%)	1(0.98%)		
2-4 weeks	8 (7.92%)	2 (1.96%)		
Duty in ICU	4 (3.96%)	1(0.98%)	0.1143	0.944459 Not Significant
Stable ward	5 (4.95%)	2 (1.96%)		
Both	3(2.97%)	1(0.98%)		

According to table 8, In our study, out of 7.88% HCWs who had Anxiety either had COVID duty within the last 7 days(7.38%HCWs) , or were new to duty i.e had completed 2-4 weeks (4.93%HCWs) , or had duty in stable ward (3.45%HCWs).

DISCUSSION

To our knowledge, there are a few studies in India, assessing the levels of stress, anxiety and depression in frontline workers of COVID epidemic. For interview techniques, Wilson et al [6] used Google forms and Lai Et al [5] used verbal consents while we did in-person interviews after written consent which we believe helped us provide Support immediately. In our study we assessed 49.75 %(n=101) PHCWs (ie Nurses and Technicians) and 50.24 % (n=102) MHCWs (Residents doctors) which is almost equal, in order to remove any discrepancy in responses between the 2 groups and compare them.

In the present study, most of the HCWs were men (59.11%), who had graduated (82.27%). Which is in contrast with study by Lai et al [5] with majority participants of married (66.7%) women (76.7%) who were undergraduates (75.8%). Also,92.97% PHCWs and 93.13% MHCWs had last Covid duty less than a week ago,86.14% PHCWs and 61.76% MHCWs had duty schedules lasting for more than 4 weeks and 21.78% PHCWs and 57.84% had duty in both ICU and ward. To our knowledge, no other study in India sufficiently highlighted the importance of prolonged work related parameters.

Among Clinical Parameters, Moderate to high levels of stress was found in 75.37% of HCWs which was almost equal (78.9%) to a study conducted by William et al [6] In India. Such significant levels of Perceived stress continuing in a population of HCWs who are constantly fighting against COVID can be detrimental for their health and their quality of life. [13] In our study no significant difference was found in perceived stress levels between nursing staff and Doctors (P value-0.308903) as both had moderate to high levels of

stress (73.73% PHCWs and 78.43 % MHCWs). This could be because both were managing crises at the frontline with prolonged duty hours.

Depressive features were seen in 34.01 % HCWs which is almost 3-5 times the prevalence of depression before Covid. [12] Depressive features (PHQ>4) was seen in 49.4% of patients in a study by Wilson et al.[6] The probable causes for this decrease in population with depression could be coping with the initial stress and resolution of the confinement after termination of lockdown.

In our study 7.88 % HCWs (11.88 % PHCWs and 3.92 % MHCWs) had mild to severe anxiety with a significant difference of p value - 0.035327. Whereas, Zhu and others [14] from Wuhan, China, had reported that among 5,062 HCPs, the prevalence rates of anxiety were 24.1%. This difference could be because of the resilience of HCWs in India and a Delay of 3 months between the 2 studies wherein HCWs might have developed various ways of coping with their anxiety.

PHCWs working >=6 weeks have high stress (45.54%) and depression (24.75%) as compared to MHCWs (19.60% and 7.84% respectively) Despite doing duty in a stable ward, PHCWs have significantly high stress (39.60%) and depression (19.80%) as compared to MHCWs (16.67% and 7.84%). MHCWs have significantly high Stress (48.03%) and depression (16.67%) while doing duty in both (ICU and ward) as compared to PHCWs (15.84% and 9.90% respectively). This significant difference could be because of lower salary and hectic duty schedules of nursing staff. Also, rigorous training of MHCWs helps them to cope better [15]. There is no significant difference in Anxiety between PHCWs and MHCWs.

CONCLUSION

Most of the HCWs were men, who had completed graduation and were living in nuclear families in Urban areas with no history of Medical / Psychiatric illness or addiction. Maximum of HCWs had duty within 7 days, had spent more than 6 weeks, and had duty in both ICU and ward at the time of participating in the study. Moderate to high levels of perceived stress was present in both PHCWs and MHCWs. The prevalence of depression in HCWs was 3-5 times the prevalence in non-COVID times in the general population. Anxiety was almost comparable to the general population. On correlating duty of PHCWs and MHCWs to perceived stress and depression, significant difference was found with longer duration and combined site of duty.

The present study is a Cross-sectional study, therefore overall Stress, anxiety and depression could not be evaluated with Limited participants and no follow up. The study was conducted in a single centre in Ahmedabad, limiting the generalization of our findings to more affected areas.

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