

## Original Research Article

# Impact of COVID-19 on mental health of healthcare professionals working in COVID-19 designated clinical areas in India

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## ABSTRACT

**Background:** In the wake of the pandemic of coronavirus disease 2019, there are reports of its impact on psychological wellbeing of the health care workers.

**Methods:** This cross-sectional survey was conducted in June 2020 in a tertiary care hospital in Delhi, India among conveniently sampled 93 participants i.e. doctors and nurses directly engaged in clinical activities in COVID-19 designated areas. A self-administered questionnaire through Google forms elicited symptoms of depression, anxiety, insomnia, and distress measured using the 9-item patient health questionnaire, 7-item generalized anxiety disorder scale, 7-item insomnia severity index, and 22-item impact of event scale-revised respectively.

**Results:** Majority (53.8%) of the participants were male and their mean age was 30.2 years. Most (72%) were nurses, the rest being doctors. A substantial proportion of the participants had depression (47.4% of the sample), anxiety (29.0%), insomnia (32.3%) and distress (22.6%). Symptoms were disproportionately higher in female and single participants, nurses; those with history of chronic illness, staying in institute provided temporary accommodation, working on regular basis and perceiving lack of adequate personal protective equipment. Taking prophylactic hydroxychloroquine was associated with lower symptom rates.

**Conclusions:** This survey revealed a considerable prevalence of mental health outcomes in HCWs demonstrating an association with age, gender; marital, professional and employment status, history of chronic illness, access to PPE, stay at institute provided temporary accommodation and prophylactic hydroxychloroquine use.

**Keywords:** COVID-19, Mental health outcomes, Health care workers

## INTRODUCTION

Corona virus disease 2019 (COVID-19), first reported in China in December 2019 has spread in epidemic form within and outside China. On January 30, 2020, the world health organization declared the global COVID-19 outbreak a public health emergency of international concern and later on 11 March as a pandemic. Globally, 30,055,710 confirmed cases and 943, 433 deaths have been reported by 18 September 2020.<sup>1</sup>

In India, too, the disease is taking a heavy toll with 1,010,824 active cases, 4,303,043 discharged and 86,752 deaths from different states, areas or union territories on 20 September 2020.<sup>2</sup> The Government of India had announced complete lockdown for 21 days in the country since 24 March 2020, followed by periodic region specific restrictions. COVID-19 has raised serious concerns about the wellbeing of front line health care workers.<sup>3-7</sup> Healthcare staff are at increased risk of psychological health problems when dealing with challenges of the COVID-19 pandemic.<sup>8</sup> In the face of the

rapidly increasing confirmed and suspected cases, much uncertainty about the nature of spread and infectivity, huge workload, burnout, inadequate resources including the protective gear and at times lack of support may all contribute to psychological stresses for them. They have to strive to balance the duty of caring for patients with concerns about their own well-being and that of their family and friends. Several studies have also reported that health care workers (HCWs) experience depression and anxiety due to the COVID-19 outbreak.<sup>4,7,9-12</sup> A study in China reported participants experiencing psychological burden, especially nurses, women, and frontline health care workers directly engaged in the diagnosis, treatment, and care for patients with COVID-19.<sup>10</sup>

The frontline health care workers are the most important pillars in tackling the COVID-19 pandemic. The best of the logistics will not be adequate if our frontline workers are not healthy and supported. In view of the enormity of the problem, it is vital to ensure that health of these individuals is protected as a public health measure. To this end, it is important to assess the prevalence of psychological manifestations in the health care workers. However, the evidence based evaluations and mental health interventions for this population are relatively scarce globally and almost non-existent in India. There is some evidence on the issues relevant to mental health manifestations in frontline health care providers from India.<sup>12</sup> Therefore the current study aimed to determine the impact of COVID-19 i.e. the prevalence of mental health outcomes that include depression, anxiety, insomnia, and distress and to identify the potential risk factors associated with these symptoms. The data obtained can serve to direct the promotion of mental wellbeing of health care workers.

## METHODS

### Study design

This cross-sectional survey was conducted in a public-funded tertiary care hospital in Delhi, India. Participants were selected using convenient sampling from the COVID designated areas in June 2020. Ethical approval was obtained from the Institutional Ethics Committee and written informed consent was obtained from participants. Participants were free to refuse or terminate their participation at any stage of the survey.

### Study Population

Doctors and nurses directly engaged in clinical activities of screening/sampling, treating, or providing care to patients with elevated temperature or patients with confirmed COVID-19 were included in the study.

### Outcome and covariates

The main outcome variates were assessed, i.e. symptoms of depression, anxiety, insomnia, and distress measured

using validated standardized tools i.e. 9-item patient health questionnaire (PHQ-9; range, 0-27), the 7-item generalized anxiety disorder (GAD-7) scale (range, 0-21), the 7-item insomnia severity index (ISI; range, 0-28) and the 22-item impact of event scale-revised (IES-R; range, 0-88) respectively.<sup>13-16</sup> Permission was obtained from the authors for using the 7-item insomnia severity index, all other tools are in public domain. The tools have been used in Indian settings in the past.<sup>17-19</sup>

The total scores of these measurement tools were categorized as follows: PHQ-9, normal (0-4), mild (5-9), moderate (10-14), and severe (15-27) depression; GAD-7, normal (0-4), mild (5-9), moderate (10-14), and severe (15-21) anxiety; ISI, normal (0-7), sub-threshold (8-14), moderate (15-21), and severe (22-28) insomnia; and IES-R, normal (0-23), mild (24-32), moderate (33-36), and severe psychological impact (>37). A cut-off score of 24 was used to define symptoms of post-traumatic stress disorder (PTSD) of a clinical concern.<sup>20</sup> The cut off score for detecting symptoms of major depression, anxiety, insomnia, and distress were 10, 10, 15 and 33 respectively. Participants who had scores greater than the cut off threshold were characterized as having severe symptoms.

The covariates included self-developed questionnaire on baseline characteristics of participants i.e. age, gender, professional status (doctor or nurse), designation, marital status, educational level, employment status, history of any illness, history of COVID-19 positive status, history of taking prophylactic hydroxychloroquine, and access to personal protective equipment (PPE), travel concerns (mode of travel) and stay at institute provided temporary accommodation during COVID-19 duty. Participants were contacted via telephone/email and self-reported data were collected using Google forms in English.

### Statistical analysis

Statistical analysis was carried out using Stata 15.0. Categorical data were summarized as frequency and percentage and continuous variables were summarized as mean $\pm$ SD. Mental health outcomes such as anxiety, depression, insomnia and PTSD symptoms were expressed as mean and 95% confidence interval.

Chi-square test was used to find association between baseline characteristics that are categorical and psychological parameters. Median test was performed to find association between age and psychological parameters. Correlation between depression (PHQ), anxiety (GAD), insomnia (ISI) and PTSD (IES-R) scores were calculated using Spearman rank correlation coefficient. Stepwise logistic regression analysis (with probability of removal of 0.15 and entry of 0.05) was done to find the independent baseline characteristics associated with mental health outcomes,  $p < 0.10$  was considered statistically significant.

## RESULTS

### Baseline characteristics

Out of the 180 healthcare workers from a tertiary care hospital, who were invited to participate in the study; 111 agreed to participate, however only 93 (83.8%) completed the survey. Baseline characteristics of these participants are presented in (Table 1). Majority (N=50, 53.8%) of the participants were male and their mean age was  $30.2 \pm 5.6$  years. Most (N=50, 53.8%) of the participants were single and 82.7% (N=77) had an educational level of undergraduate degree or diploma. Majority (72%) were nurses among whom most were nursing officers (N=57,

61.3%) and among 26 doctors, 20 were junior residents. Three quarters (N=67, 75.3%) of the participants were permanent/ regular employees. Almost half (N=46, 49.5%) reported consumption of prophylactic hydroxychloroquine. Twenty five (26.9%) used public transport arranged by the Institute to arrive at the workplace. Majority reported access to adequate (N=86, 92.5%) and appropriate (N=78, 83.9%) PPE. Eight participants perceived to have received poor quality PPE, especially the face mask. Only two participants reported personal history of COVID-19 positivity, four reported past history of mental illness and eight had been diagnosed with some other chronic illness in their lifetime.

**Table 1: Baseline characteristics of study participants (n=93).**

Variable	Frequency	Percentage
<b>Age (mean<math>\pm</math>SD) (years)</b>	30.15 $\pm$ 5.57	
<b>Gender</b>	Male	50
	Female	43
<b>Marital status</b>	Married	43
	Single	50
<b>Profession</b>	Doctor	26
	Nurse	67
<b>Highest educational qualification</b>	Undergraduate degree or diploma	77
	Postgraduate or higher degree	16
<b>Employment status</b>	Permanent/ regular employee	70
	On contract/ad-hoc basis	23
<b>Prophylactic hydroxychloroquine</b>	Yes	46
<b>Had access to adequate PPE?</b>	Yes	86
<b>Had access to appropriate PPE?</b>	Yes	78
<b>Stayed at institute provided accommodation</b>	Yes	22
<b>Mode of travel</b>	Own arrangement	65
	Public transport arranged by the Institute	25
<b>Ever been diagnosed as COVID-19 positive?</b>	Yes	2
<b>Ever been diagnosed with a mental illness?</b>	Yes	4
<b>Ever been diagnosed with any other chronic illness?</b>	Yes	8

Adequate PPE: perceived, self-reported optimum quantity of PPE for given activity and duration without compromising personal safety of the health care workers. Appropriate PPE: perceived, self-reported good quality PPE as per the type and duration of exposure ensuring personal safety of the health care workers, if used correctly.

### Prevalence of mental health outcomes and their severity

Using the predefined cut offs we found mental health symptoms in a considerable proportion of health care workers i.e. symptoms of depression in N=44 (47.4%, 95% CI: 36.9-57.9), anxiety in N=27 (29.0%, 95% CI: 20.1-39.4), insomnia in N=30 (32.3%, 95% CI: 22.9-42.7) and distress in N=21, (22.6%, 95% CI: 14.6-32.4). The overall mean (95% CI) scores on the PHQ-9 for depression, the GAD-7 for anxiety, the ISI for insomnia and the IES-R for distress for all participants were 5.29 (4.3-6.3), 4.2 (3.4-4.9), 5.9 (4.8-7.1) and 14.6 (11.4-17.8), respectively. Sixteen (17.3%) participants had moderate to severe depression symptoms, 9 (9.7%) had moderate

anxiety symptoms, 7 (7.6%) had moderate to severe (clinical) insomnia symptoms and 21(22.7%) had PTSD symptom scores of clinical concern i.e.  $\geq 24$  score (Table 2).

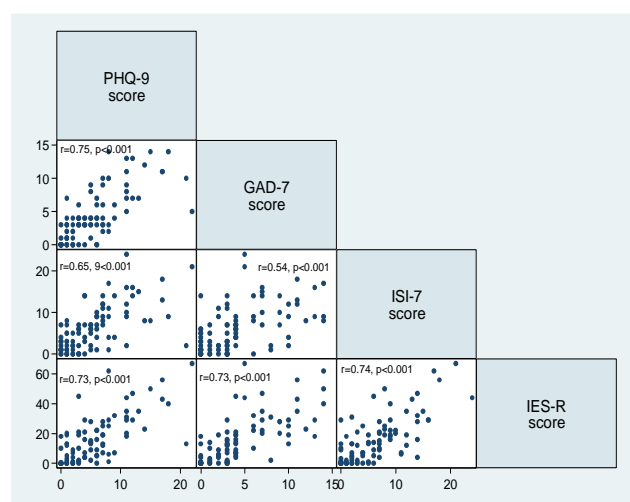
### Mental health outcome measurements and associated factors

In the univariate analysis, association of anxiety with gender ( $p=0.04$ ), stay at institute provided temporary accommodation during COVID duty ( $p=0.02$ ) and history of ever being diagnosed with any chronic illness other than mental illness ( $p=0.04$ ); of insomnia with gender ( $p=0.03$ ), stay at institute provided accommodation

( $p=0.01$ ) and access to adequate PPE ( $p=0.01$ ); and of PTSD symptoms with stay at institute provided accommodation ( $p=0.02$ ) were found to be statistically significant (Table 3). Nearly half (48%) of the female HCWs had moderate to severe anxiety compared to only 27% of male HCWs. Twelve percent of female HCWs and 2.3% male HCWs were found to have moderate to severe insomnia.

**Table 2: Severity of symptoms of mental health outcomes among HCWs (n=93).**

Severity	Values N (%)
<b>PHQ 9 depression symptoms, mean (95% CI)</b>	5.3 (4.3-6.3)
Mild or no depression	49 (52.7)
Mild depression	28(30.1)
Moderate depression	10 (10.8)
Moderately severe depression	4 (4.3)
Severe depression	2 (2.2)
<b>GAD- 7, anxiety, mean (95% CI)</b>	4.2(3.4-4.9)
Normal or Minimal	64 (68.8)
Mild	16 (17.2)
Moderate	13 (14.0)
<b>ISI, insomnia symptoms, mean (95% CI)</b>	5.9(4.8-7.1)
No clinically significant insomnia	63 (67.7)
Subthreshold insomnia	17 (18.3)
Clinical insomnia (moderate)	6 (6.5)
Clinical insomnia (severe)	1 (1.1)
<b>IES-R, distress symptoms, mean (95% CI)</b>	14.6 (11.4-17.8)
Normal	72 (77.4)
Mild	10 (10.8)
Moderate	2 (2.2)
Severe	9 (9.7)



**Figure 1: Correlation between depression (PHQ), anxiety (GAD), insomnia (ISI) and PTSD (IES-R) scores (n=93).**

Multivariate logistic regression revealed a significant association of symptoms of depression with stay at Institute provided accommodation during COVID duty, and professional and marital status; of anxiety with age, gender, history of a chronic illness (other than mental illness) and stay at Institute provided accommodation; of insomnia with stay at Institute provided accommodation, use of prophylactic hydroxychloroquine, perceived access to adequate PPE and employment status; and of PTSD symptoms with stay at Institute provided accommodation, marital and employment status, and access to adequate PPE (Table 4).

More nurses than doctors (OR: 4.71, 95% CI: 1.32-16.8), HCWs who stayed at Institute provided accommodation during COVID duty (OR: 0.27, 95% CI: 1.32-16.8) and who were single (OR: 2.52, 95% CI: 0.90-7.07) reported symptoms of depression. Being female (OR: 2.77, 95% CI: 0.87-8.85), stay at institute provided accommodation (OR: 0.17, 95% CI: 0.05-0.57) and having history of a chronic illness (other than mental illness) (OR: 13.86, 95% CI: (2.21-86.93) was associated with significantly more anxiety. With increasing age, the anxiety seemed to lessen (OR: 0.89, 95% CI: 0.80-1.00). Staying at institute provided accommodation during COVID duty (OR: 0.14, 95% CI: 0.04-0.49), being in regular employment (OR: 6.70, 95% CI: 1.15-38.98) and not having access to adequate PPE as perceived by the participants (OR: 49.46, 95% CI: 4.38-558.87) was associated with more insomnia symptoms; whereas using prophylactic hydroxychloroquine (OR: 0.22, 95% CI: 0.05-0.73) was associated with lesser insomnia. Staying at institute provided accommodation during COVID-19 duty (OR: 0.23, 95% CI: 0.07-0.77), being single (OR: 3.10, 95% CI: 0.94-10.30), working as a permanent/regular employee (OR: 10.46, 95% CI: (1.45-75.20) and perceived lack of access to adequate PPE (OR: 8.60, 95% CI: 1.10-67.36) was associated with significantly more PTSD symptoms (Table 5-6). Further analysis indicates a positive relationship between all the mental health outcomes i.e. depression, anxiety, insomnia and post-traumatic stress symptoms (Figure 1).

## DISCUSSION

Current cross sectional survey enrolled 93 HCWs who were engaged in treating/caring for COVID-19 confirmed or suspected cases. Current study revealed a considerable prevalence of adverse mental health symptoms and an association of these symptoms with age, gender; marital, professional and employment status, stay at Institute provided accommodation during COVID duty, use of prophylactic hydroxychloroquine, access to adequate PPE, and history of a chronic illness (other than mental illness). In current study it was observed that a substantial prevalence of mental health symptoms viz. depression (47.3%), anxiety (29.0%), insomnia (32.3%) and distress (22.6%) which is lower than a Chinese study that reported prevalence of 50.4%, 44.6%, 34.0% and 71.5% for respective symptoms.<sup>10</sup> However, Tay et al from

Singapore reported that 14.5% participants in their study screened positive for anxiety, 8.9% for depression, 6.6% for stress, and 7.7% for clinical concern of PTSD.<sup>11</sup> Similarly, a multinational study from Singapore and India found anxiety in 15.7%, depression in 10.6%, stress in 5.2% and PTSD of clinical concern in 7.4% of study participants.<sup>12</sup> In sharp contrast to our study, these prevalence rates are much lower. This could be attributed to better mental preparedness and stringent infection control measures after Singapore's SARS experience.

Both these studies used DASS-21 to assess symptoms of depression, anxiety, stress; and IES-R to evaluate PTSD. However, the Indian cohort in this multinational study too reported lower prevalence rates i.e. depression (12.4%), anxiety (17.1%), stress (3.8%) and distress (7.3%). This again is, possibly due to different trajectories of anxiety, depression, stress and post traumatic symptoms in different areas of the country, further influenced by individual resilience and occupational environment.

**Table 3: Univariate logistic regression (n=93).**

Variables	Depression			Anxiety			Insomnia			PTSD symptoms		
	No (N)	Yes (N)	OR, (95% CI), P value	No (N)	Yes (N)	OR, (95% CI), P value	No (N)	Yes (N)	OR, (95% CI), P value	No (N)	Yes (N)	OR, (95% CI), P value
<b>Age* (mean)</b>	30.7	29.52	0.96 (0.89-1.04) 0.303	30.6	29.0	0.94 (0.86-1.03) 0.205	30.5	29.3	0.96 (0.88-1.04) 0.329	30.4	29.0	0.95 (0.86-1.05) 0.304
<b>Gender</b>												
Male	27	16	2.15 (0.93-4.94)	35	8	2.68 (1.03-6.98)	34	9	2.74 (1.09-6.90)	37	6	2.64 (0.92-7.58)
Female	22	28	0.072 <sup>†</sup>	31	19	0.043*	29	21	0.033*	35	15	0.071 <sup>†</sup>
<b>Marital status</b>												
Married	25	18	1.50 (0.66-3.42)	33	10	1.7 (0.68-4.26)	30	13	1.19 (0.50-2.85)	36	7	2.00 (0.72-5.54)
Single	24	26	0.330	33	17	0.257	33	17	0.699	36	14	0.182
<b>Profession</b>												
Doctor	16	10	1.65 (0.65-4.15)	19	7	1.16 (0.42-3.18)	19	7	1.42 (0.32-3.87)	22	4	1.87 (0.56-6.20)
Nurse	33	34	0.289	47	20	0.780	44	23	0.494	50	17	0.306
<b>Highest educational qualification</b>												
UG degree or diploma	41	36	1.14 (0.39-3.34)	55	22	1.14 (0.35-3.65)	52	25	0.94 (0.30-3.01)	59	18	0.76 (0.19-2.95)
PG or higher degree	8	8	0.813	11	5	0.830	11	5	0.924	13	3	0.688
<b>Employment status</b>												
Contract	13	10	1.23 (0.48-3.17)	17	6	1.21 (0.42-3.51)	17	6	1.48 (0.52-4.24)	21	2	3.91 (0.84-18.30)
Permanent/regular	36	34	0.671	49	21	0.720 <sup>†</sup>	46	24	0.467	51	19	0.083 <sup>†</sup>
<b>Prophylactic hydroxychloroquine</b>												
No	23	24	0.74 (0.33-1.67)	34	13	1.14 (0.47-2.80)	28	19	0.46 (0.19-1.13)	36	11	0.91 (0.34-2.41)
Yes	26	20	0.464	32	14	0.768	35	11	0.091 <sup>†</sup>	36	10	0.848
<b>Accessibility to adequate PPE</b>												
Yes	49	37	-	63	23	3.65 (0.76-17.58)	62	24	15.50 (1.77-135.59)	68	18	2.83 (0.58-13.82)
No	0	7	-	3	4	0.106	1	6	0.013*	4	3	0.198

Continued.



Variables	Depression			Anxiety			Insomnia			PTSD symptoms		
	No (N)	Yes (N)	OR, (95% CI), P value	No (N)	Yes (N)	OR, (95% CI), P value	No (N)	Yes (N)	OR, (95% CI), P value	No (N)	Yes (N)	OR, (95% CI), P value
<b>Accessibility to appropriate PPE</b>												
Yes	44	34	2.58 (0.81-8.28)	56	22	1.27 (0.39-4.15)	56	22	2.91 (0.94-8.99)	63	15	2.80 (0.86-9.08)
No	5	10	0.109	10	5	0.689	7	8	0.064 <sup>†</sup>	9	6	0.086 <sup>†</sup>
<b>Mode of travel</b>												
Own private transport.	38	30	1.61 (0.64-4.06)	50	18	1.56 (0.59-4.16)	47	21	1.25 (0.48-3.31)	54	14	1.5 (0.52-4.30)
Transport arranged by institute.	11	14	0.311	16	9	0.371	16	9	0.640	18	7	0.450
<b>Stayed in institute provided temporary accommodation</b>												
Yes	8	14	0.42 (0.16-1.12)	11	11	0.29 (0.11-0.79)	10	12	0.28 (0.10-0.77)	13	9	0.29 (0.10-0.84)
No	41	30	0.084 <sup>†</sup>	55	16	0.016*	53	18	0.013*	59	12	0.023*
<b>Ever been diagnosed as COVID-19 positive?</b>												
No	49	42	-	64	27	-	63	28	-	70	21	-
Yes	0	2	-	2	0	-	0	2	-	2	0	-
<b>Ever been diagnosed with a mental illness?</b>												
No	48	41	3.51 (0.35-35.07)	64	25	2.56 (0.34-19.18)	61	28	2.18 (0.29-16.27)	2	2	3.68 (0.49-27.90)
Yes	1	3	0.285	2	2	0.360	2	2	0.448	70	19	0.207
<b>Ever been diagnosed with any other chronic illness?</b>												
No	45	40	1.13 (0.26-4.80)	63	22	4.77 (1.05-21.64)	57	28	0.68 (0.13-3.58)	65	20	0.46 (0.05-4.00)
Yes	4	4	0.873	3	5	0.043*	6	2	0.648	7	1	0.485

UG-Undergraduate; PG- Postgraduate; \*p&lt;0.05, †p&lt;0.10

**Table 4: Multivariate logistic regression.**

Variable	OR (95% C.I)	P value
Depression		
Stayed in institute accommodation		
Yes	1.00	0.019*
No	0.27 (0.09-0.81)	
Designation		
Doctor	1.00	0.017*
Nurse	4.72 (1.32-16.85)	
Marital status		
Married	1.00	0.080 <sup>#</sup>
Single	2.52 (0.90-7.07)	
Taken hydroxychloroquine		
No	1.00	0.123
Yes	0.46 (0.17-1.23)	

Continued.

Variable	OR (95% C.I)	P value
<b>Anxiety</b>		
Age (years)	0.89 (0.80-1.00)	0.054 <sup>†</sup>
<b>Gender</b>		
Male	1.00	0.086 <sup>†</sup>
Female	2.77 (0.87-8.85)	
<b>Mental illness</b>		
No	1.00	0.140
Yes	7.14 (0.52-97.40)	
<b>Chronic illness</b>		
No	1.00	0.005*
Yes	13.86 (2.21-86.93)	
<b>Accessibility to adequate PPE</b>		
Yes	1.00	0.133
No	4.59 (0.63-33.52)	
<b>Stayed in institute accommodation</b>		
Yes	1.00	0.004*
No	0.17 (0.05-0.57)	
<b>Insomnia</b>		
<b>Stayed in institute accommodation</b>		
Yes	1.00	0.002*
No	0.14 (0.04-0.49)	
<b>Taken hydroxychloroquine</b>		
No	1.00	0.013*
Yes	0.22 (0.05-0.73)	
<b>Accessibility to adequate PPE</b>		
Yes	1.00	0.002*
No	49.46 (4.38-558.87)	
<b>Employment status</b>		
Contractual	1.00	0.034*
Regular/permanent	6.70 (1.15- 38.98)	
<b>PTSD symptoms</b>		
<b>Mental illness</b>		
No	1.00	0.149
Yes	10.78 (0.43-272.21)	
<b>Stayed in institute accommodation</b>		
Yes	1.00	0.017*
No	0.23 (0 .07-0.77)	
<b>Marital status</b>		
Married	1.00	0.064 <sup>†</sup>
Single	3.10 (0 .94-10.30)	
<b>Employment status</b>		
Contractual	1.00	0.020*
Regular/permanent	10.46 (1.45-75.21)	
<b>Accessibility to adequate PPE</b>		
Yes	1.00	0.041*
No	8.60 (1.10-67.36)	

\*p<0.05, <sup>†</sup>p<0.10

Further, in current study, 11.9% participants reported moderate to severe PTSD as compared to only 3.8% in the multinational study.<sup>12</sup> In both the studies, moderate to severe cases of psychological distress accounted for

almost half of total positive for clinical concern of PTSD. Current study revealed that female HCWs were more likely to experience symptoms of anxiety.<sup>10</sup> Being women, their expected roles for own family can aggravate

their symptoms due to the fear of carrying the infection home. Moreover, anxiety symptoms were lesser with increasing age of the participants. With increasing age, HCWs tend to have senior titles with higher probability of engaging in supervisory role rather than direct patient care and hence lesser apprehension of getting the infection. More nurses reported symptoms of distress than doctors.<sup>10</sup> The nature of nurses responsibilities, their closer and frequent contact with patients, often longer duty hours place them at a high risk of infection.

In current study, participants staying at institute provided temporary accommodation during COVID duty were more likely to report all four psychological symptoms viz. depression, anxiety, insomnia and PTSD. It seems despite all odds, health care workers prefer the familiarity of their own homes, and the probable company of their families. Single HCWs reported more depression and PTSD symptoms than their married counterparts. Additionally, HCWs with history of chronic illness had significantly more anxiety symptoms than those with no such history. Chronicity and comorbidity influence the risk of COVID-19 infection and the course of the disease.<sup>21</sup>

Having adequate PPE is likely to provide a sense of security to the HCWs against COVID infection. In this study, HCW's perceived lack of access to adequate PPE was associated with more insomnia and PTSD symptoms. Our study also indicated that HCWs who were in permanent/regular employment reported more insomnia and PTSD symptoms. Regular employees may find themselves locked in with their current employment unlike temporary workers who have the greater job mobility. In addition, HCWs who consumed prophylactic hydroxychloroquine were significantly less likely to report insomnia symptoms as compared to those who did not take the drug. In the midst of an extremely unpredictable and evolving disease, such prophylactic measures are expected to provide some assurance and work as a safety net for the HCWs. The implications of the findings are the need to cater to psychological distress of health care workers. Additionally, provision of adequate PPE and generating awareness regarding the standard PPE guidelines can possibly assuage the concerns of the health care providers about their safety, and thus can help them to function more effectively. Also, pragmatic solutions are required for safer and familiar residence that can promote better sleep, either by reducing the apprehensions or by being with their loved ones. In any case, a refreshed healthcare provider is likely to be better engaged in clinical care services.

### Limitations

Limitations of current study were; first of all the single setting and a relatively small sample size selected conveniently limits the generalizability and scope of the study. Secondly, the data was obtained by self-report and not verified by medical records. It's cross sectional design limits the empirical associations. It also does not provide

information on the progression of the psychological impact over a period of time. A longitudinal follow-up study could help identify the trends in psychological influence of the pandemic once the immediate threat of the disease is over.

### CONCLUSION

COVID-19 has emerged as a major public health problem that needs to be addressed at all levels of health care. Current study highlights the substantial prevalence of adverse mental health symptoms among the front line health care workers i.e. doctors and nurses working with COVID-19 suspect or confirmed cases. Hence, the need of the hour is to take into account these psychological implications for the front line workers, from the grass roots to the tertiary level. To alleviate their stress and anxiety, special interventions need to be planned and executed as an important public health measure to address the pandemic.

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