

Psychosocial impact and coping strategies of frontline healthcare workers in Western Rajasthan during COVID-19 pandemic

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Abstract

Background and Aims: Coronavirus disease-2019 (COVID-19) pandemic-related stress is an important but under-rated issue needing attention. Stress and causative factors vary between the regions and individuals depending on the availability of resources, socio-cultural differences, and individual perceptions. We aimed to study the psychosocial impact and coping strategies among the healthcare workers (HCWs) in Western Rajasthan during COVID-19 pandemic.

Material and Methods: This questionnaire-based observational study, consisting of 59 questions in 6 sections, was conducted to identify stress, causative factors, coping strategies, and experiences of HCWs working in personal protective equipment (PPE). Chi-square test was used to compare the responses between different subgroups.

Results: Majority of the HCWs felt responsible for treating COVID-19 patients (98.8%), but also felt that it was affecting their safety (81.4%). On subgroup analysis, doctors were found to be more stressed than nursing staff ($P = 0.004$). Major stressors included concerns about infecting family members and lack of specific treatment for COVID-19 (87.5%). Family support was found to be a major stress-relieving factor (97.3%). Most HCWs suggested that comfortable quarantine stay, adequate supply of PPE, and equipments would help in reducing stress.

Conclusion: Frontline HCWs in Western Rajasthan were under significant stress during COVID-19 pandemic. We found that stress-causing factors and coping strategies varied between different subgroups based on profession, gender, and age. We recommend conducting such studies in different regions of the world to develop relevant and region-specific strategies to help HCWs cope with stress more efficiently, thereby, strengthening the healthcare system to deal with future pandemics.

Keywords: COVID-19, healthcare workers, psychological stress

Introduction


COVID-19 (coronavirus disease-2019) pandemic has compromised the wellbeing of millions of people worldwide. Its high transmission rate causes significant stress and emotional

trauma for the frontline healthcare workers (HCWs) who are directly involved in the treatment and care of COVID-19 patients.^[1,2] They are under the constant stress of acquiring infection and transmitting it to their family members. The unclear nature of the disease and lack of definitive treatment further adds on to the stress of HCWs.

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Access this article online	
Quick Response Code:	Website: https://journals.lww.com/joacp
	DOI: 10.4103/joacp.joacp_291_21

How to cite this article: Kumari K, Chaudhary K, Chhabra S, Bhatia P, Kamal M, Kishan R, *et al.* Psychosocial impact and coping strategies of frontline healthcare workers in Western Rajasthan during COVID-19 pandemic. *J Anaesthesiol Clin Pharmacol* 2022;38:S58-65.

Submitted: 08-Jun-2021

Revised: 12-Jul-2021

Accepted: 14-Jul-2021

Published: 15-Jun-2022

In past pandemics, stress coping strategies like family support, recognition and appreciation of work, institutional policies, and protective measures have been found to play an important role in reducing psychological stress among the frontline HCWs.^[3,4]

Past experiences of epidemics and pandemics indicate that the recent COVID-19 outbreak can have a significant psychological impact on the frontline HCWs.^[5-7] But, the stress of each pandemic varies because of the different rates of infectivity, mortality, and availability of treatment. It also varies among different geographical regions due to differences in local climate, prevailing cultural practices and beliefs, and available resources. Also, individuals from different professions, age groups, and gender can experience a different level of stress and use different coping strategies. There are limited studies on the psychosocial impact and coping strategies of COVID-19 among the frontline HCWs of India and no study on HCWs of Rajasthan. The experience and dilemma of frontline HCWs working in personal protective equipment (PPE) suit has not been studied in detail before. So, the present study was planned with the primary objective to know the proportion of different types of psychosocial impact, sources of stress, and coping strategies among frontline HCWs working in PPE suit in Western Rajasthan during the COVID-19 outbreak. The secondary objective was to determine the association of psychosocial impact, sources of stress, coping strategies with various factors like profession, age-groups, gender, marital status, place of work, and also to know about the experience of frontline HCWs with PPE suits.

Material and Methods

After approval from the institutional ethical committee (number- AIIMS/IEC/2020-21/3040) and clinical trial registration (CTRI/2020/08/027174), this cross-sectional observational study was conducted. The participants were doctors and nursing staff working with PPE kit in COVID-19 designated areas of either central institute or government and private medical colleges or various hospitals of the Western Rajasthan. For the study, "PPE kit" consisted of N95/FFP2 mask, gown, gloves, eye protection, shoe covers, and apron. The study tool was a comprehensive questionnaire derived and modified from a previous study.^[5] The questionnaire consisted of 6 sections with a total of 59 questions in the English language. The 6 sections included questions related to the basic demographic data, emotions and feelings of HCWs during the COVID-19 outbreak, possible stress-causing factors, stress-reducing factors, and suggestions by HCWs for areas of improvement needed to decrease the stress level, and experiences of HCWs while working in PPE and the responses were acquired in the Yes/No format.

About 600 HCWs working with PPE kit in COVID-19 designated areas of various hospitals of the Western Rajasthan were identified and an online questionnaire was mailed as Google Form with a consent form appended to it. Participation was voluntary with a limit of one response per participant.

Data from the questionnaire were compiled and analyzed using descriptive statistics. Statistical analysis was done using EPI info version 7.2.1.0 CDC, Atlanta, GA, USA, 2018 statistical software. Categorical variables were expressed as number and percentage and were analyzed using the Chi-square test. A value of $P < 0.05$ was considered statistically significant.

Results

The response rate was 69.17% with a total of 415 HCWs responding to our questionnaire. Doctors constituted 59% of the total respondents, whereas the remaining 41% was nursing staff. The demographic details (gender, age, marital status, place of work, co-morbid illness) of all respondents are shown in Table 1.

The emotions and feelings of HCWs are shown in Table 2. 98.8% of HCWs felt that it was their social and moral responsibility to serve COVID-19 patients, though 81.4% of HCWs also felt that their sense of responsibility was affecting their own safety. 82.3% of nursing staff felt that all their colleagues felt equally responsible, whereas this feeling was seen among only 68.9% of doctors ($P = 0.003$). Compared to the nursing staff, more doctors were stressed out when posted for

Table 1: Demographics of health care workers

Characteristics	Total (n=415) n (%)	Doctors (n=245) n (%)	Nursing staff (n=170) n (%)
Age (years)			
<30	212 (51.1)	121 (49.4)	91 (53.5)
30-65	202 (48.7)	123 (50.2)	79 (46.5)
>65	01 (0.002)	01 (0.004)	00
Gender			
Male	303 (73)	169 (68.9)	134 (78.8)
Female	112 (27)	76 (31)	36 (21.2)
Married	288 (69.4)	152 (62)	136 (80)
Having Children	208 (50.1)	102 (41.6)	106 (62.3)
Living with family	240 (57.8)	131 (53.5)	109 (64.1)
Place of Work			
COVID screening area	71 (17.1)	44 (17.9)	27 (15.9)
COVID suspect ward/ICU	117 (28.2)	77 (31.4)	40 (23.5)
COVID ward/ICU	227 (54.7)	124 (50.6)	103 (60.6)
Type of Institution			
Central Institute	156 (37.4)	81 (33.1)	75 (44.1)
Government medical college	206 (49.6)	139 (56.7)	67 (39.4)
Other Government and Private Hospitals	53 (12.8)	25 (10.2)	28 (16.4)
Co-morbid illness	48 (11.6)	31 (12.7)	17 (10)

Table 2: Health care worker's emotions

Question	Total (n=415) n* (%)	Doctors (n=245) n* (%)	Nursing staff (n=170) n* (%)	P	Females (n=112) n* (%)	Males (n=303) n* (%)	P
Do you feel it's your social and moral responsibility to serve COVID-19 patients?	410 (98.8)	242 (98.7)	168 (98.8)	0.679	108 (96.4)	302 (99.7)	0.029
Do you feel that your sense of responsibility affects your own safety?	336 (81.4)	203 (82.8)	135 (79.4)	0.448	90 (80.3)	248 (82.7)	0.838
Do you think all your colleagues feel equally responsible?	309 (74.5)	169 (68.9)	140 (82.3)	0.003	72 (64.3)	237 (78.2)	0.006
Do you feel nervous or stressed out when posted for COVID-19 duties?	309 (74.5)	158 (64.4)	85 (50)	0.004	40 (35.8)	167 (55.1)	0.026
Do you feel that, your colleagues who are not directly exposed to COVID-19 patients, avoid direct interaction with you?	211 (50.8)	121 (49.4)	90 (52.9)	0.540	48 (42.8)	163 (53.8)	0.062
Do you feel that your neighbors avoid direct interaction with you?	265 (63.9)	159 (64.9)	106 (62.3)	0.670	69 (61.6)	196 (64.7)	0.642
Are you angry that your workload has increased as compared to other employees who are not exposed to COVID-19 patients?	199 (47.2)	128 (52.2)	68 (40)	0.018	44 (39.3)	152 (50.2)	0.063
Do you expect recognition of your work from the hospital authorities?	308 (74.2)	167 (68.2)	141 (82.9)	0.001	82 (73.2)	226 (74.6)	0.875

n*- Number of individuals who answered yes to the question in each subgroup

COVID-19 duties ($P = 0.004$) and felt that their workload has increased ($P = 0.018$). More number of nursing staff expected recognition of work than doctors ($P = 0.001$). Both males and females (99.7% and 96.4%, respectively) felt that it was their social and moral responsibility to serve COVID-19 patients, but males felt more responsible ($P = 0.029$). Compared to females (35.8%), males (55.1%) felt more stressed out when posted for COVID-19 duties ($P = 0.026$). Both, those living with or without family, were equally stressed during COVID-19 duties (56% and 60.4%, respectively, $P = 0.423$). No statistically significant difference was found among different age groups.

Stress-causing factors among HCWs are shown in Table 3. Concerns for family safety and lack of specific treatment and vaccine for COVID-19 were major stressors among most of the HCWs (87.5%). Other common stress factors included the rising number of COVID-19 cases each day (82.9%) and seeing colleagues getting infected (82.2%). Compared to nursing staff, doctors were more stressed about quarantine/isolation ($P = 0.012$), colleagues getting infected ($P = 0.004$), uncertainty about control of COVID-19 outbreak ($P < 0.001$) and continuation of COVID-19 duties ($P < 0.001$), increasing number of cases each day ($P = 0.026$), lack of specific treatment/vaccine for COVID-19 ($P < 0.001$), lack of adequate supply of PPE ($P = 0.014$), and lack of adequate medical staff/equipments/resources in COVID-19 areas ($P < 0.001$). Doctors also felt more academic over-exhaustion than nursing staff ($P < 0.001$).

Females rated a few factors as significantly more stressful than males, such as, quarantine/isolation ($P = 0.007$), uncertainty

on continuation of COVID-19 duties ($P = 0.005$), lack of adequate medical staff/equipment/resources ($P < 0.001$). Males were more worried than females about infecting their families ($P = 0.031$). HCWs of 30-65 years, as compared to their younger (<30 years) colleagues, were more stressed about infecting themselves (77.2% and 66.5%, respectively, $P = 0.026$) and their family (94.5% and 81.1%, respectively, $P < 0.001$) and lack of specific treatment and vaccine for COVID-19 (92.6% and 83%, respectively, $P = 0.008$). HCWs living with the family were more concerned about infecting their family than those living alone (92.5% and 80.6%, respectively, $P < 0.001$) and were more worried about quarantine (63.3% and 49.7%, respectively, $P = 0.008$) and lack of adequate supply of PPE (53.7% and 41.7%, respectively, $P = 0.02$).

Factors that directly or indirectly reduced the stress of HCWs during the COVID-19 outbreak are shown in Table 4. Family support was the most important factor helpful in reducing stress among the majority of HCWs irrespective of their age, gender, or profession (97.3%). Other major stress-reducing factors were the satisfaction of treating the patients (92%), seeing colleagues working together on the front line (90.8%), and quick and smooth recovery of infected colleagues (90.4%).

Stress coping strategies differed among doctors and nursing staff. For nursing staff, factors like clear guidelines from the hospital for infection prevention ($P < 0.001$), hydroxychloroquine prophylaxis ($P < 0.001$), temporary residential arrangement by hospital administration ($P = 0.002$), trust in their hospital of getting adequate care if they get infected ($P < 0.001$) and meditation/yoga ($P < 0.001$) played a significant role in reducing stress. For doctors, the main stress-coping strategies

Table 3: Factors causing stress among health care workers

Stress Factor	Total (n=415) n' (%)	Doctors (n=245) n' (%)	Nursing Staff (n=170) n' (%)	P	Females (n=112) n' (%)	Males (n=303) n' (%)	P
Are you worried about infecting yourself?	297 (71.6)	183 (74.7)	114 (67)	0.113	82 (73.2)	215 (70.9)	0.741
Are you worried about infecting your family?	363 (87.5)	220 (89.8)	143 (84.1)	0.117	91 (81.2)	272 (89.8)	0.031
Are you worried about Quarantine/Isolation?	239 (57.6)	154 (62.9)	85 (50)	0.012	77 (68.7)	162 (53.5)	0.007
Are you worried seeing your colleagues getting infected?	241 (82.2)	213 (86.9)	128 (75.3)	0.004	92 (82.1)	249 (82.2)	0.892
Does, not knowing when the COVID-19 outbreak will be under control, bothers you?	333 (80.2)	216 (88.2)	117 (68.8)	<0.001	94 (83.9)	239 (78.9)	0.313
Are you worried not knowing how long COVID-19 duties will continue?	297 (71.6)	196 (80)	101 (59.4)	<0.001	92 (82.1)	205 (67.6)	0.005
Are you stressed with the increasing number of cases each day?	344 (82.9)	212 (86.5)	132 (77.6)	0.026	98 (87.5)	246 (81.2)	0.171
Do you feel academic over-exhaustion through webinars?	248 (59.8)	167 (68.2)	81 (47.6)	<0.001	70 (62.5)	178 (58.7)	0.562
Are you worried about the lack of specific treatment and vaccine for COVID-19?	363 (87.5)	226 (92.2)	137 (80.6)	<0.001	103 (91.9)	260 (85.8)	0.130
Are you worried about the lack of adequate supply of PPE in your institute?	213 (51.3)	132 (53.9)	70 (41.2)	0.014	56 (50)	146 (48.2)	0.828
Are you stressed about the lack of adequate medical staff or medical equipment/resources in COVID areas?	284 (68.4)	186 (75.9)	98 (57.6)	<0.001	91 (81.2)	193 (63.7)	<0.001
Are you worried about your current sleep pattern/sleep disturbances?	240 (57.8)	149 (60.8)	91 (53.5)	0.168	67 (59.8)	173 (57.1)	0.699

n*- Number of individuals who answered yes to the question in each subgroup

were avoiding media news ($P = 0.003$) and chatting with colleagues ($P = 0.039$).

The satisfaction of treating and seeing patients getting cured ($P < 0.001$) and trust in their hospital of getting adequate care if they get infected ($P = 0.015$) were significantly more stress-relieving factors for males than females. HCWs living with the family were more relieved by treating and seeing patients getting cured (94.6% and 88.6%, respectively, $P = 0.04$) and taking prophylactic hydroxychloroquine (57.1% and 43.4%, respectively, $P = 0.008$). No statistically significant difference was found in stress-coping strategies among the different age groups. Majority of HCWs suggested that ensuring the adequacy of medical staff/equipment (95.7%), adequate supply of PPE kit (92.3%), and comfortable quarantine stay (92%) will help in reducing stress [Table 4]. Experience of HCWs and the problems faced while working in PPE are shown in Table 5. The duration of PPE wear among HCWs varied from <6 h (32.3%), 6–8 h (43.4%), and 8–12 h (22.2%) with only 2.1% HCWs working for >12 h in PPE. The frequency of wearing PPE was once a day in most HCWs (63.6%). 72.8% of respondents had fear of breach in PPE kit and it was more among doctors than nursing staff ($P = 0.012$). HCWs working in GMCs had more fear of breach in PPE ($P = 0.001$) and they actually had more breach in PPE than that of CI ($P < 0.001$). Most of the HCWs of CI (96.1%) got prior training of wearing PPE which was significantly more than those working in GMCs ($P < 0.001$). Individual perceptions with the use of PPE varied but a majority of HCWs reported

fatigue (65.3%), thirst (77.6%), thermal discomfort (63.1%), sweating (85.5%), and breathing difficulty (58.8%) while working in PPE. HCWs also experienced impeded mobility (65.3%) and impeded communication (57.6%) with the use of PPE.

Discussion

HCWs are the frontline warriors of any epidemic or pandemic who serve the patients and humanity at the cost of their own safety. Population differs in different regions of the world with respect to their stress perception and coping strategies, based on the different socio-cultural practices, economic status, and government policies. We conducted this questionnaire-based cross-sectional observational study to know the sources of stress, psychosocial impact, and coping strategies among frontline HCWs working in PPE kit in Western Rajasthan during the COVID-19 outbreak. Similar to the studies done across the globe,^[8-12] our study also revealed significant stress among frontline HCWs due to the recent COVID-19 out-break. We also identified differences in stress and coping strategies between doctors and nursing staff, males and females and different age groups.

Despite the dilemma of how to maintain a balance of duty towards their patients and family, most of the HCWs considered it their social and moral responsibility to serve COVID-19 patients with utmost sincerity, but many also felt that it was affecting their own safety. These results were similar to the studies conducted on prior epidemics.^[3,4,13] The causes

Table 4: Table showing factors that help in reducing stress of HCWs and their suggestions for areas of improvement

Stress-reducing factors	Total (n=415) n* (%)	Doctors (n=245) n* (%)	Nursing staff (n=170) n* (%)	P	Females (n=112) n* (%)	Males (n=303) n* (%)	P
Clear guidelines from hospital for infection prevention	315 (75.9)	171 (69.8)	144 (84.7)	<0.001	84 (75)	231 (76.2)	0.895
Satisfaction of treating your patients and seeing them getting cured	382 (92)	218 (88.9)	164 (96.5)	0.010	93 (83)	289 (95.4)	<0.001
Gratitude from patients and relatives	350 (84.3)	197 (80.4)	153 (90)	0.012	88 (78.6)	262 (86.5)	0.070
Positive attitude of your colleagues and seniors of your department	354 (85.3)	201 (82)	153 (90)	0.035	91 (81.2)	263 (86.8)	0.207
Seeing your friends and seniors working together on front line	377 (90.8)	224 (91.4)	153 (90)	0.747	101 (90.2)	276 (97.7)	0.925
Hydroxychloroquine prophylaxis	213 (51.3)	102 (41.6)	111 (65.3)	<0.001	57 (50.9)	156 (51.5)	0.997
After taking strict protective measures minimum/no risk of infection	341 (82.2)	195 (79.6)	146 (85.9)	0.130	92 (82.1)	249 (82.2)	0.892
Quick and smooth recovery of infected colleagues	375 (90.4)	223 (91)	152 (89.4)	0.706	100 (89.3)	275 (90.7)	0.792
No overtime	263 (63.4)	159 (64.9)	104 (61.2)	0.503	72 (64.3)	191 (63)	0.905
Temporary residential arrangement by hospital administration	304 (73.3)	165 (67.3)	139 (81.8)	0.002	77 (68.7)	227 (74.9)	0.256
Trust in your hospital of getting adequate care if you get infected	298 (71.8)	157 (64.1)	141 (82.9)	<0.001	70 (62.5)	228 (75.2)	0.015
Avoiding media news on COVID	329 (79.3)	207 (84.5)	122 (71.8)	0.003	91 (81.2)	238 (78.5)	0.641
Joking and chatting with colleagues	318 (76.6)	197 (80.41)	121 (71.2)	0.039	79 (70.5)	239 (78.9)	0.099
Family support	404 (97.3)	242 (98.78)	162 (95.3)	0.063	109 (97.3)	295 (97.4)	0.747
Meditation/Yoga	278 (67)	136 (55.5)	142 (83.5)	<0.001	68 (60.7)	210 (69.3)	0.125
Suggestion							
Do you believe that decreasing the duration of duty hours will help in decreasing your stress level?	343 (82.7)	204 (83.3)	139 (81.8)	0.791	91 (81.2)	252 (83.2)	0.755
Do you think that decreasing the no of days of COVID-19 duty cycle will help in reducing your stress level?	337 (81.2)	194 (79.2)	143 (84.1)	0.255	82 (73.2)	255 (84.1)	0.017
Do you think a comfortable quarantine stay will help in reducing your stress level?	382 (92)	225 (91.8)	157 (92.3)	0.955	94 (83.9)	288 (95.1)	<0.001
Do you think ensuring adequacy of medical staff/medical equipment will help in reducing your stress level?	397 (95.7)	243 (99.2)	163 (95.9)	0.951	106 (94.6)	291 (96)	0.727
Do you think ensuring adequate supply of PPE kit will help in reducing your stress level?	383 (92.3)	221 (90.2)	162 (95.3)	0.085	97 (86.6)	286 (94.4)	0.015

n*- Number of individuals who answered yes to the question in each subgroup; HCWs- health care workers

of stress during a pandemic can vary for different individuals due to different demographic profiles and personal beliefs. The most common (>80%) stress factor was related to the safety concerns including uncertainty about specific treatment and duration for which pandemic would last, worries of spreading the infection to their family, and seeing colleagues getting infected. Overview of major stress factors suggests that HCWs are more concerned about the well-being of their family, colleagues, and society in general and are fulfilling their moral responsibility by placing others before themselves.

Doctors and nursing staff involved in the treatment of COVID-19 patients tend to have different stress thresholds due to differences in their work profile, type of patient interaction, level of responsibility, and training. Compared to the nursing staff, we found that significantly more doctors felt stressed out when posted for COVID-19 duties. Our findings were in line with the studies done by Chan *et al.*^[14] and Lung *et al.*,^[15] who reported more stress among doctors

than in nurses. They explained that doctors had to be extra-vigilant and alert for prolonged periods during examining and reviewing patients for screening and segregation and maintaining such high level of alertness for a prolonged duration to avoid misdiagnosis can be extremely stressful. However, a few other studies have contradicting results with nurses having a much higher score of illness perception compared to doctors in general, but a lower score, when compared specifically to junior doctors due to more time spent with patients.^[7,16] In our study, additional possible causes for doctors having more stress can be attributed to their relatively longer working hours due to low doctor-population ratio in the Indian context,^[17] higher level of awareness about COVID-19 related morbidity and mortality, direct involvement in aerosol-generating procedures like intubation, and more responsibility and accountability of doctors than nursing staff. Similar to the previous studies,^[3,4,8] another interesting finding in our study was that more nurses (82.3%) acknowledged that their colleagues felt equally responsible,

Table 5: Experience of health care workers working in Personal Protective Equipment (PPE) kit

Experience of working in PPE kit	Total (n=415) n* (%)	Doctors (n=245) n* (%)	Nursing Staff (n=170) n* (%)	P	Central Institute (n=156) n* (%)	Government Medical college (n=206) n* (%)	P
Total duration of PPE wear (hours)							
<6	134 (32.3)	81 (33.1)	53 (31.2)	0.185	40 (25.6)	64 (31.1)	0.207
6-8	180 (43.4)	3 (1.2)	80 (47.1)		72 (46.1)	96 (46.6)	
8-12	92 (22.2)	100 (40.8)	31 (18.2)		43 (27.6)	42 (20.4)	
12	9 (2.1)	61 (24.9)	6 (3.5)		1 (0.6)	6 (2.9)	
Frequency of PPE wear (No. of times/day)							
1	264 (63.6)	153 (62.4)	111 (65.3)	0.007	118 (75.6)	116 (56.3)	<0.001
2	105 (25.3)	72 (29.4)	33 (19.4)		33 (21.1)	59 (28.6)	
≥3	46 (11.1)	20 (8.2)	26 (15.3)		5 (3.2)	33 (16)	
Fear of breach of PPE Kit	302 (72.8)	190 (77.5)	112 (65.9)	0.012	98 (62.8)	164 (79.6)	0.001
Has any breach in PPE kit occurred till date?	152 (36.6)	90 (36.7)	62 (36.5)	0.961	32 (20.5)	94 (45.6)	<0.001
Did you get prior training of PPE use?	276 (66.5)	156 (63.7)	120 (70.6)	0.173	150 (96.1)	99 (48.1)	<0.001
Was the training helpful?	266 (64.1)	151/156 (96.8)	115/120 (95.8)	0.921	141 (90.4)	96 (46.6)	0.554
Individual Perceptions with use of PPE Kit							
Fatigue	271 (65.3)						
Hunger	98 (23.6)						
Thirst	322 (77.6)						
Urinary urgency	203 (48.9)						
Nausea/Dizziness	142 (34.2)						
Thermal discomfort	262 (63.1)						
Sweating	355 (85.5)						
Skin irritation	178 (42.9)						
Breathing difficulty	244 (58.8)						
Claustrophobia	61 (14.7)						
a) Impedance with use of PPE Kit	268 (64.6)						
b) Impeded vision	197 (47.5)						
c) Impeded concentration	222 (53.3)						
d) Impeded fine motor skills	214 (51.6)						
e) Impeded Mobility	271 (65.3)						
f) Impeded communication with co-workers	239 (57.6)						
g) Impeded communication with patients	166 (40)						
h) Impeded patient care	41 (9.9)						
i) None	00						

n*- Number of individuals who answered yes to the question in each subgroup

whereas this feeling was less among doctors (68.9%). As in tertiary care hospitals, doctors are specialized in different clinical and para-clinical specialities and not all are assigned an equal amount of COVID-19 duties, resentment can therefore exist among doctors of certain clinical specialities engaged in hectic COVID-19 duties.

The impact of gender in developing physical and emotional stress has been well studied. Many studies have reported more stress among female HCWs, who tend to perceive events as more negative.^[10,12] However, in a study conducted in Italy during the COVID-19 pandemic,^[18] gender differences did not have an impact in terms of psychopathological consequences. In our study, it was surprising to find that males felt more nervous or stressed out when posted for COVID-19 duties than females. A possible explanation could be that women are more likely to develop coping mechanisms to deal with the stress both at the social level and at the workplace as compared to men.^[19] Moreover, female HCWs, especially in the Indian context, might have a higher stress threshold due

to routine exposure to various challenges while dealing with dual household and workplace responsibilities.

A higher level of stress can be expected in the elderly population due to associated co-morbidities and increased exhaustion due to prolonged working hours as has been previously reported by Cai *et al.*^[3] But, in our study, no significant difference was found in stress level between different age groups. The possible cause may be less number of HCWs with co-morbid illness (11.6%) and also relative relaxation usually given to the elder HCWs while duty allocation as they hold additional administrative responsibilities. Similarly, Liang *et al.* in their study found that though younger HCWs had more self-reported depression scores than older (>30 years), the difference found was not statistically significant.^[20]

Though stress cannot be avoided in present circumstances, stress-coping measures have become the need of the hour. Most of the HCWs have been using personalized strategies either subjective (positive attitude, resilience, and altruism)

or objective (exercise/yoga and personal protection by following institutional protocols) to reduce stress and prevent psychological breakdown.^[21-23] Looking at the results of our study, factors such as family support, seeing patients getting cured, smooth recovery of colleagues, and HCWs working together selflessly, has helped most HCWs (>90%) to cope with stress. Most of the HCWs in our study suggested that the provision of adequate PPE kits, equipments, and adequacy of medical staff has helped them work more efficiently and alleviate stress. Such measures have also been reported in studies conducted during the Severe Acute Respiratory Syndrome outbreak as dominant motivators for HCWs.^[24] As also expressed by Tomas *et al.*,^[25] knowledge of the main stress factors is essential to formulate stress-relieving strategies and provide psychological support and counselling to the staff.

PPE has become the new uniform of COVID-19 response teams, but, ensuring optimal quality of PPE and proper training is a must to prevent contamination. As expected, a higher incidence of actual PPE breach and fear of PPE breach was found among HCWs who did not receive prior training (49.6% and 85.6%, respectively) than those who were adequately trained (29.9% and 69.3%, respectively). Despite individual perceptions which might be affected due to lack of adequate knowledge regarding PPE, proper training of PPE use is a must to ensure the safety of HCWs.^[26,27] Working in PPE comes with its unique set of problems which have been reported with varying frequencies by HCWs across the world. The most common problems found with PPE in our study were sweating, thirst, thermal discomfort, impeded mobility, and communication with fellow workers. PPE with more comfortable materials should be designed to prevent these avoidable discomforts.

The strength of our study was that the response rate (69.17%) was higher than the previously reported similar surveys. Moreover, the response was collected when the incidence of COVID-19 was at its peak in India reflecting the actual psychosocial stress faced by the frontline HCWs treating critically ill COVID-19 patients. This study had several limitations. Firstly, the data collected from this study was based on subjective responses using a questionnaire and no objective measurements and quantitative grading/evaluation of stress were done which could have helped us identify the HCWs under severe stress for active intervention. The present study was conducted at one point of time and no follow-up of HCWs was done, as psychosocial stress can accumulate and occur later in the form of posttraumatic stress disorder, which should be investigated by a follow-up study.

We conclude that a large number of HCWs are performing their duties under stress and anxiety. Numerous stress factors

are affecting different HCWs to varying degrees and most are trying to find and implement ways to reduce anxiety in a personalized way. Such invisible psychological battles are taking place every day in innumerable HCWs worldwide and there always remains a risk of slipping into clinically evident depression. Such studies should be conducted worldwide to help the administrators know their HCWs better and prepare a plan to help them cope with stress. After all, HCWs are the Achilles heel of society's health and the one important lesson that COVID-19 pandemic has taught us is to "be prepared".

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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