Original Article

Psychological Impact on Health-care Workers at a Tertiary Hospital in South India during the COVID-19 Pandemic

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ABSTRACT

Background: The COVID-19 pandemic has overwhelmed the health-care infrastructure in the country. The steadily increasing number of cases and workload, inadequacy of healthcare infrastructure, and perceived lack of support contribute to psychological stress among health-care workers (HCWs). **Aims:** This cross-sectional survey estimated the prevalence and factors associated with depressive, anxiety, and stress symptoms among HCWs during the COVID-19 pandemic at a tertiary care hospital in South India. **Methodology:** Randomly chosen HCWs who provided informed consent were recruited to the study and administered the Depression Anxiety and Stress Scale-21, Clinical Interview Schedule-Revised, and the revised stigma scale to assess for depressive, anxiety, and stress symptoms, common mental disorders, and stigma, respectively. Sociodemographic details were also recorded. Bivariate and multivariate statistics were obtained. **Results:** One hundred and twenty-seven participants completed the survey questionnaire. The overall prevalence of significant depressive, anxiety, and stress symptoms was 31.5%, 26%, and 16.5%, respectively. Depressive symptoms were associated with younger age, being single, presence of medical illness in the family, current nicotine, and alcohol use. Anxiety symptoms were associated with younger age, being single, and working in a clinical area with potential for exposure to COVID-19 patients. The presence of children at home was associated with lower depressive or anxiety scores. Nearly 15.7% of the participants had a primary psychiatric diagnosis. **Conclusions:** HCWs are at risk of experiencing psychological distress during the ongoing COVID-19 pandemic. Our findings suggest that a supportive environment is essential to protect and promote the psychological well-being of HCWs during and after the outbreak. Early psychological interventions for those who require it can prevent long-term sequelae in this vulnerable group.

KEYWORDS: *COVID 19, frontline, healthcare workers, pandemic, psychological impact*

INTRODUCTION

The COVID-19 pandemic has resulted in large-scale disruption of life and livelihood of people across the world. The waves of the pandemic have resulted in thousands of people being subjected to increased mental stress due to the threat of disease, loneliness of isolation, loss of loved ones, loss of income, and on-going uncertainty about the duration of the pandemic. The psychological impact of the COVID-19 pandemic, the risk and protective factors across individual, and social and public health levels have been described extensively.[1-3]

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Pandemics are challenging to health-care workers (HCWs), especially those who are at the frontline. The magnitude and the rapid escalation of the COVID-19 situation found HCWs unprepared and ill-equipped to handle the demands. Myriad factors contribute to the stress experienced by this group including the high risk of exposure, fears about passing the infection to others in their family, inadequacy of personal protective equipment (PPE), inadequate health infrastructure to manage the increasing patient load, constantly changing protocols, and uncertainties about the foreseeable future. The emotional demands of witnessing patients succumbing to the illness every day and the inability to offer admission and treatment to everybody due to shortage of critical care beds further compound the physician's misery.

Large-scale disasters have been shown to cause a significant increase in mental health disorders in both the immediate aftermath of the trauma and over longer periods of time.[2] Those studies that specifically examined the psychological impact of epidemics, such as the 2003 severe acute respiratory syndrome (SARS) outbreak, found that up to 10% of HCWs had high SARS-related posttraumatic stress symptoms even 1 year after the outbreak.[3] The COVID-19 pandemic is hundred times larger in magnitude compared to the SARS epidemic. Since the onset of the pandemic, there have been several reports of higher levels of psychological distress among HCWs in countries across the world including India.[4-6] While some reports have suggested that frontline workers are more affected than nonfrontline workers due to the higher risk of infection,[7] others have not found such a difference.[8] Despite its robust health-care infrastructure, Tamil Nadu state has been significantly affected by the pandemic; however, literature on this topic is scarce. Hence, this study was done with the aim of assessing the psychological impact of the pandemic on HCWs in the region by estimating the prevalence of and factors associated with depression, anxiety, and stress among workers with different levels of disease exposure. This will help in a better understanding of the problem, which will facilitate early diagnosis and appropriate interventions to minimize the impact on this vulnerable population during these uncertain times.

METHODOLOGY

Study design and setting
This study employing a cross-sectional design was carried out in the months of July and August 2020. Participants were recruited at a 2700 bedded tertiary care hospital. During the peak of the pandemic, about 900 beds were earmarked for inpatient care of COVID patients. The hospital employs around 1300 doctors, 3400 nurses, 500 paramedical staff, 600 clerical staff, and about 1500 support staff.

Participants
All HCWs (medical, paramedical, and support staff) working in the Departments of Emergency Medicine, Critical Care, Virology, Psychiatry, Anatomy, Physiology, Biochemistry, and Pharmacology were eligible to participate in the study. Unwillingness to provide informed consent was the only exclusion criteria. Nursing staff had already been recruited to a similar study and were therefore not included in this study. A list of all the staff employed in these departments was obtained, and participants were selected randomly using lots. Participants who reported the potential for direct contact with COVID-19 patients/ samples were defined as "frontline." Among the various departments in the hospital, HCWs from Emergency Medicine, Critical Care, Virology, and Psychiatry were categorized as frontline and those from Anatomy, Physiology, Biochemistry (nonclinical), and Pharmacology as nonfrontline HCWs. All participants were recruited after they provided written informed consent. At the time of the survey, during the initial phase of the pandemic, COVID wards and pooling of medical/paramedical staff for 'COVID duty' had not been established. None of the participants in the nonfrontline group had clinical exposure to COVID-19 patients in the hospital setting.

Assessment
The sociodemographic details of all the participants were collected using a specially designed proforma. The Depression, Anxiety, and Stress Scale-21 (DASS-21) was used to assess psychological stress. This scale consists of three subscales, each with seven items, measuring depression (DASS 21-D), anxiety (DASS 21-A), and stress (DASS 21-S).[9-11] A score of 10 or more on the DASS 21-D, 8 or more on the DASS 21-A, and 15 or more on the DASS 21-S indicate significant depressive, anxiety, and stress symptoms.[5,6] The Clinical Interview Schedule-Revised (CIS-R) was used to assess for the presence of common mental disorders (CMDs).[12,13,14] An algorithm based on the ICD-10 diagnostic criteria was used to confirm a diagnosis based on the CIS-R.[9] Stigma perceived by the HCWs was measured using the stigma scale, which was adapted from the HIV and TB stigma scale.[15-19] This included 13 statements with regard to perceived stigma, with responses ranging from strongly disagree to strongly agree. The questionnaire also had two open-ended questions related to concerns and factors aiding in coping with the pandemic situation.

Tamil versions of all instruments were made available for participants who were not comfortable with the English versions. Participants were asked to complete a self-reporting questionnaire. Most of the participants completed the questionnaires in about 20–40 min. An investigator was present to clarify any queries during the data collection.

Statistical analysis

Mean, standard deviation, and range were employed to describe continuous variables, while frequency distributions were obtained for polychotomous variables. The Chi-square test and Student's *t*-test were used to assess the significance of the associations for categorical and continuous variables, respectively. Multivariate logistic regression analysis was carried out using factors found significant on bivariate analysis. Variables that were significant in bivariate analyses were adjusted for age in multivariate statistics, as age is known to be associated with depression, anxiety, and prognosis in patients with COVID-19; in addition, there was a significant difference in age between the two HCW groups. SPSS for Windows (version 16.0.1) (IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp) was employed for the analysis of data.

Ethical considerations

The Institutional Review Board and Ethics Committee approved the study protocol (IRB Min. No. 13062 dated July 22, 2020).

RESULTS

One hundred and thirty HCWs were invited to participate in the survey. Three HCWs refused consent, and hence the study enrolled 127 participants with a response rate of 97.7%. HCWs included medical faculty (47), postgraduate trainees (34), technicians (22), housekeeping staff (11), psychologists, social workers, occupational therapists (6), medical records staff (5), and pharmacists (2).

The sociodemographic and clinical characteristics of the sample are described in Table 1. The majority were men, currently married with a mean age of 34.72 years (standard deviation ± 9.66) from an urban background. The HCWs were classified into two groups of frontline and nonfrontline based on the potential for exposure to patients or samples with COVID-19. The frontline group (82 participants) comprised HCWs from Emergency Medicine, Critical Care, Virology, and Psychiatry. The nonfrontline group (45 participants) included HCWs from Anatomy, Physiology, Biochemistry, and Pharmacology. There was a statistically significant difference between the

two groups on age and marital status. A minority of the participants reported alcohol use (18.1%) and nicotine use (7.9%). Less than half of participants reported that someone in their family had a chronic medical illness, and 21.3% reported that they themselves had a chronic medical illness. At the time of the survey, none of the participants had reported that either they or anyone in their family had contracted SARS CoV-2 infection.

Depressive, anxiety, and stress symptoms

The overall prevalence of significant depressive, anxiety, and stress symptoms among HCWs as identified by the DASS-21 scores were 31.5%, 26%, and 16.5%, respectively. The prevalence of depressive symptoms was more among the frontline group (36.6%); however, this was not statistically significant (χ^2 = 2.778, df = 1, P = 0.096) as compared to the nonfrontline group (22.2%). However, anxiety symptoms were significantly more among the frontline group (32.9%) as compared to nonfrontline (13.3%) group (χ^2 = 5.8, df = 1, P = 0.016). Similarly, stress symptoms were also significantly more among the frontline group (23.2%) as compared to nonfrontline (4.4%) group (χ^2 = 7.383, df = 1, P = 0.007).

On bivariate analysis depressive symptoms were associated with younger age (t = 3.549, d = 125, P = 0.001), being single (χ^2 = 5.395, df = 1, P = 0.02), presence of medical illness in the family (χ^2 = 8.156, df = 1, P = 0.004), current smoking (χ^2 = 7.459, df = 1, P = 0.011), and alcohol use (χ^2 = 5. 566, df = 1, P = 0.018). Those participants who reported that they have children at home reported lower depressive symptoms (χ^2 = 7.131, df = 1, P = 0.008). Medical illness in the family (odds ratio [OR] =0.424, confidence interval [CI] – 0.186–0.968, P = 0.042), current alcohol use (OR = 0.321, CI – 0.119–0.864, P = 0.025), and current smoking (OR = 0.151, CI – 0.032–0.711, P = 0.017) remained significant on adjusting for age on logistic regression [Table 2].

Significant anxiety symptoms were also associated with lower age (t = 3.538, d = 125, P = 0.001), being single (χ^2 = 4.456, df = 1, P = 0.035), and working in a frontline area (χ^2 = 5.8, df = 1, =1, P = 0.016), while children at home (χ^2 = 5.589, df = 1, P = 0.028) was associated with lower anxiety symptoms. Stress symptoms were associated with younger age (t = 2.527, d = 125, P = 0.013), single status (χ^2 = 4.827, df = 1, P = 0.028), medical illness in the family (χ^2 = 4.091, df = 1, P = 0.045), and working in a frontline area (χ^2 = 4.827, df = 1, P = 0.028). These associations are presented in Tables 3 and 4.

Table 1: Baseline socio-demographic and clinical variables

Characteristic	Frontline (*n*=82), *n* (%)	Nonfrontline (*n*=45), *n* (%)	χ^2/*t*	*P*
Gender-male	52 (63.4)	25 (55.6)	0.752	0.386
Age (years), mean±SD	31.7±8.07	40.22±9.95	5.235	0.000**
Education (years), mean±SD	18.6±3.3	18.32±3.45	−0.424	0.672
Type of family-nuclear	58 (70.7)	34 (75.6)	3.465	0.177
Elderly people at home - yes	32 (39)	16 (35.6)	0.149	0.7
Children at home - yes	33 (40.2)	24 (53.3)	2.012	0.156
Marital status - currently married	37 (45.1)	33 (73.3)	9.348	0.002*
Habitat - urban	76 (92.7)	39 (86.7)	1.229	0.268
Chronic medical illness in family members - present	45 (54.9)	17 (37.8)	3.4	0.065
Chronic medical illness - present	15 (18.3)	12 (26.7)	1.217	0.27
Alcohol use - current	19 (23.2)	4 (8.9)	3.996	0.055
Smoking - current	9 (11)	1 (2.2)	3.069	0.096
DASS-21 D score, mean±SD	7.39±7.2	4.58±5.75	−2.255	0.026*
DASS-21 depressive symptoms - present	30 (36.6)	10 (22.2)	2.778	0.096
DASS-21 A score, mean±SD	5.37±6.03	2.71±3.79	−2.675	0.008*
DASS-21 anxiety symptoms - present	27 (32.9)	6 (13.3)	5.8	0.016*
DASS-21 S score, mean±SD	9.29±7.31	5.73±5.79	−2.815	0.006*
DASS 21 stress symptoms - present	19 (23.2)	2 (4.4)	7.383	0.007*
DASS 21 total score, mean±SD	22.05±18.13	13.02±13.13	−2.941	0.004*
Common mental disorder - present	7 (8.5)	3 (6.7)	0.14	1.0
Any psychiatric diagnosis (ICD-10) as per CISR algorithm	15 (18.3)	5 (11.1)	1.129	0.288

*$P<0.05$, **$P<0.001$. χ^2: Pearson Chi-square value, *t* value: Independent *t*-test, SD: Standard deviation, ICD: Classification of diseases, DASS-21: Depression Anxiety and Stress Scale, CISR: Clinical interview schedule revised

Common mental disorders

Ten participants (5.5%), seven from frontline and three from nonfrontline departments, fulfilled the criteria for CMD based on CIS-R. Twenty participants fulfilled criteria for a psychiatric diagnosis based on an algorithm from CIS-R (depression [11.8%], nonorganic insomnia [3.9%], generalized anxiety disorder [2.4%], dysthymia, panic disorder, and specific phobia [1.1%] each). More participants from the frontline group (18.3%) were diagnosed to have a psychiatric illness than nonfrontline (11.1%) group, but this was not statistically significant ($\chi^2 = 1.129$, df = 1, $P = 0.288$). Being married ($\chi^2 = 5.411$, df = 1, $P = 0.02$) and having children at home ($\chi^2 = 5.339$, df = 1, $P = 0.023$) were associated with lower prevalence of CMDs. These findings are summarized in Table 5.

Stigma

Participant responses to the stigma questionnaire are summarized in Table 6. About half of the HCW's surveyed agreed to the statements "Most people are uncomfortable around someone who works with COVID-19 patients/samples" and "Some people avoid touching me once they know I am working with patients/samples with COVID-19." Seventeen percent of the HCW's stated that they would prefer to be away from work during this period if given a choice. More nonfrontline workers reported this than frontline workers ($\chi^2 = 6.756$, df = 1, $P = 0.009$).

Participants were asked two open-ended questions about their major concerns and what would have helped them coped better during the pandemic. The most commonly reported concerns were about the welfare of their family and friends (28.3%) and their own health (12.6%). Adequate PPE (18.6%) and strict following of social distancing at all places (18.6%) were reported as measures that would have helped HCWs cope better.

DISCUSSION

Infectious disease outbreaks/epidemics in the past have caused a significant short- and long-term psychological impact on HCWs.[2,20,21-23] The impact has ranged from increased stress levels to developing depressive, anxiety, substance use, and posttraumatic stress disorders. HCWs have experienced stigmatization, have felt fearful of being the source of infection to their family and friends, and have even considered resigning from work. Similar findings have been reported from other studies in our country as well as from other countries around the world during the current COVID-19 pandemic.[1,2] A comprehensive understanding of the psychological burden among HCWs will be crucial in providing psychological support and improving mental health support services. This report details findings on the psychological impact of the pandemic on HCWs in the early stages of the pandemic during July–August 2020 in India.

Table 2: Association of depressive symptoms among healthcare worker's with sociodemographic and clinical variables

Characteristics	Significant depressive symptoms (DASS-21D ≥10)		Bivariate statistics			Multivariate statistics (adjusted for age)$	
	Absent (*n*=87)	Present (*n*=40)	χ^2/t	df	*P*	OR (CI)	*P*
Age (years), mean±SD	36.69±10.21	30.42±6.62	3.549	125	0.001*	-	-
Gender							
Male	51	26	0.467	1	0.494	-	-
Female	36	14					
Marital status							
Single	33 (37.9)	24 (60)	5.395	1	0.02*	0.938 (0.416-2.115)	0.877
Married	54 (62.1)	16 (40)					
Chronic medical illness in the family							
Absent	52 (59.8)	13 (32.5)	8.156	1	0.004*	0.424 (0.186-0.968)	0.042*
Present	35 (40.2)	27 (67.5)					
Chronic medical illness in the person							
Absent	65	35	2.677	1	0.102	-	-
Present	22	5					
Children present at home							
Absent	41 (47.1)	29 (82.5)	7.131	1	0.008*	1.823 (0.729-4.562)	0.199
Present	46 (52.9)	11 (17.5)					
Elderly present at home							
Absent	53	26	0.194	1	0.660	-	-
Present	34	14					
Type of HCW							
Nonfrontline	35	10	2.778	1	0.096	0.905 (0.354-2.308)	0.834
Frontline	52	30					
Current alcohol use							
Absent	76 (87.4)	28 (70)	5.566	1	0.018*	0.321 (0.119-0.864)	0.025*
Present	11 (12.6)	12 (30)					
Current smoking							
Absent	84 (96.6)	33 (82.5)	7.459#	1	0.011*	0.151 (0.032-0.711)	0.017*
Present	3 (3.4)	7 (17.5)					

$Logistic regression adjusted for age, #Fisher's exact test, *P<0.05. There were no statistically significant associations between depressive symptoms and items on HCW stigma questionnaire. DASS-21S: Depression Anxiety and Stress Scale-stress subscale, *t*: *t* value on independent *t*-test, χ^2: Pearson Chi-square value, df: Degree of freedom, HCW: Healthcare worker, SD: Standard deviation, OR: Odds ratio, CI: Confidence interval

Prevalence of depressive, anxiety, and stress symptoms

In this survey, the prevalence of significant depressive, anxiety, and stress symptoms among HCWs were 31.5%, 26%, and 16.5%, respectively. Similar rates were reported in a survey among Indian armed force doctors as well as other online surveys among HCWs from India, Singapore, and Australia during the current pandemic.[22-27] These rates, however, are low in contrast to reports from Europe and China, where higher prevalence rates have been reported.[28-30] The lower rates of psychological problems reported in this study could be a consequence of the timing of the study, which was during the period of the lockdown, when the COVID-related demands on the health-care system were just beginning. In addition, while dealing with the influx of patients, the hospital administration had taken several steps to ensure safety and well-being of staff that may

have resulted in lower rates of psychological distress among the HCWs during this survey. These included ensuring availability of adequate PPE, division of staff into teams and staggering of the workforce, providing for the health care of HCWs and their family members, making transport arrangements available for staff to travel during the lockdown, and providing increased access to psychological support.

While we were not able to compare with prepandemic rates of psychological distress in the study population, earlier studies report that the rate of anxiety and depression among HCWs is higher than what is reported in the general population.[31]

Stigma

Stigma in an epidemic is the labeling and discrimination against people that occurs because of their perceived link to the epidemic. It has enormous implications not

Table 3: Association of anxiety symptoms among healthcare worker's with sociodemographic and clinical variables

Characteristics	Significant anxiety symptoms (DASS-21A ≥8)		Bivariate statistics			Multivariate statistics (adjusted for age)$	
	Absent (*n*=94)	Present (*n*=33)	χ^2/*t*	df	*P*	OR (CI)	*P*
Age (years), mean±SD	36.44 (9.89)	29.82 (7.02)	3.538	125	0.001*	-	-
Gender							
Male	57	20	0.0	1	0.997	-	-
Female	37	13					
Marital status-currently							
Single	37 (39.4)	20 (60.6)	4.456	1	0.035*	0.982 (0.34-2.839)	0.973
Married	57 (60.6)	13 (39.4)					
Chronic medical illness in the family							
Absent	52	13	2.479	1	0.115		
Present	42	20					
Chronic medical illness in the person						-	-
Absent	71	29	2.224	1	0.136		
Present	23	4					
Children present at home							
Absent	46 (48.9)	24 (72.7)	5.589	1	0.018*	1.526 (0.557-4.183)	0.411
Present	48 (51.1)	9 (27.3)					
Elderly present at home							
Absent	58	21	0.39	1	0.844	-	-
Present	36	12					
Type of HCW							
Nonfrontline	39 (41.5)	6 (18.2)	5.8	1	0.016*	0.554 (0.192-1.598)	0.274
Frontline	55 (58.5)	27 (81.2)					
Current alcohol use							
Absent	79	25	1.13	1	0.288	-	-
Present	15	8					
Current smoking							
Absent	87	30	0.091	1	0.719#	-	-
Present	7	3					
People's attitudes about COVID-19 make me feel worse about myself							
Disagree	57	17	7.756	1	0.005*	0.292 (0.111-0.771)	0.013*
Agree	13	14					

$Logistic regression adjusted for age, #Fisher's exact test, *P< 0.05, **P<0.001. There were no other statistically significant associations between anxiety symptoms and other items on HCW stigma questionnaire. DASS-21S: Depression Anxiety and Stress Scale-stress subscale, *t*: *t* value on independent *t*-test, χ^2: Pearson Chi-square value, df: Degree of freedom, HCW: Healthcare worker, SD: Standard deviation, OR: Odds ratio, CI: Confidence interval

only for patients experiencing influenza-like symptoms, regardless of a positive diagnosis of COVID-19 infection but also for HCWs.[32] The majority of the HCWs agreed with the statement that people's attitude made them feel worse about themselves. It has been reported in literature that those who perceived higher levels of stigma experienced more psychological stress, which can in turn produce more physical complaints, affect work performance and satisfaction and produce fatigue and burnout.[30] The many reports in the media about health-care providers being harassed and persecuted in the context of the pandemic may have discouraged some staff who have responded that they would prefer to take time off work during this period.

Risk factors of psychological morbidity

Previous reports have suggested that female HCWs are at higher risk for psychological problems during the pandemic.[27,28,33] Our results did not find this despite the expectation that the paternalistic culture and the pressures of the dual roles that working women have in India would have caused greater psychiatric morbidity among them; this may have been due to the inherent limitation of the sample with the majority of the sample being male, unlike previous reports. Those HCWs working in areas with high levels of exposure to patients with COVID-19 such as in frontline settings were found to have a higher rate of psychological problems than others; this has been reported in several

Table 4: Association of stress symptoms among healthcare worker's with socio-demographic and clinical variables

Characteristics	Significant stress symptoms (DASS-21S ≥15)		Bivariate statistics			Multivariate statistics (adjusted for age)$	
	Absent (*n*=106)	Present (*n*=21)	χ^2/*t*	df	*P*	OR (CI)	*P*
Age (years), mean±SD	35.66 (10.01)	29.95 (5.7)	2.527	125	0.013*	-	-
Gender							
Male	65	12	0.128	1	0.72	-	-
Female	41	9					
Marital status-currently							
Single	43	14	4.827	1	0.028*	1.65 (0.488-5.576)	0.42
Married	63	7					
Chronic medical illness in the family							
Absent	56	9	0.698	1	0.404	-	-
Present	50	12					
Chronic medical illness in the person							
Absent	80	20	4.091	1	0.045*,#	3.902 (0.468-32.526)	0.208
Present	26	1					
Children present at home							
Absent	55	15	2.706	1	0.1	-	-
Present	51	6					
Elderly present at home							
Absent	65	14	0.213	1	0.644	-	-
Present	41	7					
Type of HCW							
Nonfrontline	43	2	7.383	1	0.006*,#	0.231 (0.48-1.114)	0.068
Frontline	63	19					
Current alcohol use							
Absent	87	17	0.015	1	1.0	-	-
Present	19	4					
Current smoking							
Absent	98	19	0.094#	1	0.67#	-	-
Present	8	2					

$Logistic regression adjusted for age, #Fisher's exact test, *$P< 0.05$, **$P< 0.001$. There were no statistically significant associations between stress symptoms and items on HCW stigma questionnaire. DASS-21S: Depression Anxiety and Stress Scale-stress subscale, *t*: *t* value on independent *t*-test, χ^2: Pearson Chi-square value, df: Degree of freedom, HCW: Healthcare worker, SD: Standard deviation, OR: Odds ratio, CI: Confidence interval

other studies.[34-37] Dobson *et al.* however reported that the rates were no different among frontline and nonfrontline groups and postulated that this was because nonoccupational COVID-related issues such as the socioeconomic impact and uncertainties regarding the future were in the forefront rather than occupational exposure risk.[30]

Younger HCWs were found to report more psychological problems. Most studies have suggested that older age is a protective factor against developing psychological distress during infectious disease outbreaks.[30] Greater likelihood of unmarried status in the younger group as well as the impact of social isolation and restrictions on their lifestyle may have contributed to greater distress. The sudden and unexpected reduction in supports like creches or domestic help due to the abrupt implementation of the lockdown may have added to the pressure on young families.[30] In addition,

a methodological limitation was that the mean age of HCW from frontline areas was significantly lower than those from low-exposure environments.

Increased morbidity and mortality among the elderly and those with chronic medical illnesses were clearly established early in the pandemic. This was reflected in the higher rate of psychological morbidity among those HCWs who lived with someone with a medical illness and has been described earlier.[38-41] HCWs with medical or psychiatric comorbidities themselves did not appear to have greater psychological morbidity in this and earlier studies.[28] Staff with children at home had fewer depressive, anxiety, or stress symptoms, unlike other reports.[42,43] There are several factors that may have contributed to this finding: the benign nature of COVID-19 with mild or asymptomatic infections among children, the ability to spend quality time with children secondary to the lockdown as well as the connectedness

Table 5: Association of common mental disorders with sociodemographic and clinical variables among healthcare worker's

Characteristics	Common mental disorder as per CISR		Bivariate statistics		
	Absent (*n*=117)	Present (*n*=10)	χ^2/t	df	P
Age (years), mean±SD	35.2 (9.75)	29.1 (6.44)	1.937	125	0.055
Gender					
Male	71	6	0.002	1	1.0[#]
Female	46	1			
Marital status-currently					
Single	49	8	5.411	1	0.02*,[#]
Married	68	2			
Chronic medical illness in the family					
Absent	63	2	4.224	1	0.51[#]
Present	54	8			
Chronic medical illness in the person					
Absent	91	9	0.822	1	0.688[#]
Present	26	1			
Children present at home					
Absent	61	9	5.339	1	0.023*,[#]
Present	56	1			
Elderly present at home					
Absent	72	7	0.281	1	0.741[#]
Present	45	3			
Type of HCW					
Nonfrontline	42	3	0.14	1	0.708[#]
Frontline	75	7			
Current alcohol use					
Absent	96	8	0.026	1	1[#]
Present	21	2			
Current smoking					
Absent	108	9	0.068	1	0.573[#]
Present	9	1			

[$]Logistic regression adjusted for age, [#]Fisher's exact test, *$P< 0.05$. CISR: Clinical interview schedule-revised, *t*: *t* value on independent *t*-test, χ^2: Pearson Chi-square value, df: Degree of freedom, HCW: Healthcare worker, SD: Standard deviation, OR: Odds ratio, CI: Confidence interval

to family and support systems which are known to be protective against emotional distress.

HCWs who were smokers may have been more concerned about their health given their awareness of the potential complications and worsening lung functions due to an infection by this respiratory pathogen. It is possible that substance use may have been a coping strategy to deal with increased stress levels.

The predictors of increased psychological morbidity that have been identified need to be confirmed in longitudinal studies with more robust study designs. It is planned to follow-up participants at 6 months which will help clarify the direction of the associations obtained in this study. From the early stages of the pandemic, the institution responded proactively and consistently to ensure that HCWs were adequately supported by ensuring clear and regular communication, improving staff confidence by adequate training, strengthening of infection control practices, ensuring availability of adequate PPE, making rapid modifications to the infrastructure to promote staff safety, and enhancing access to peer and psychological support services. This may have helped to keep the level of psychological distress lower than that expected. This was also reflected in the stigma questionnaire, where several respondents mentioned that they had no major concerns despite the uncertainty of the situation. Implementation of such strategies across the nation would strengthen the psychological well-being of this at-risk group in this high-pressure situation.[44,45-47]

Strengths and limitations

This is a cross-sectional study, and by its nature, does not allow for inferences to be made with respect to the direction of association between the variables. A follow-up study is in progress to better understand these. Although HCWs who were not willing to consent were excluded and self-administered questionnaires

Table 6: Participant responses to the stigma questionnaire							
Characteristic	Frontline (*n*=82)		Nonfrontline (*n*=45)		χ^2	df	*P*
	Agree, *n* (%)	Disagree, *n* (%)	Agree, *n* (%)	Disagree, *n* (%)			
I feel guilty because I am working with patients/ samples with COVID-19	6 (7.3)	73 (89)	1 (2.2)	12 (26.7)	0	1	1.0
People's attitudes about COVID-19 make me feel worse about myself	20 (24.4)	58 (70.7)	7 (15.6)	16 (35.6)	0.208	1	0.648
Telling someone that I am working with patients/ samples with COVID-19 is risky	36 (43.9)	41 (50)	2 (4.4)	10 (22.2)	3.841	1	0.063
I work hard to keep my work with patients/samples with COVID-19 a secret	19 (23.2)	59 (72)	6 (13.3)	9 (20)	1.566	1	0.211
I feel I am not as good as a person as others because I am working with patients/samples with COVID-19	1 (1.2)	77 (93.9)	-	13 (28.9)	0.169	1	1
People working with COVID-19 patients/samples are treated like outcasts	34 (41.5)	43 (52.4)	7 (15.6)	15 (33.3)	1.074	1	0.3
Most people believe that a person who works with COVID-19 patients/samples is dirty	-	82 (100)	1	27 (60)	-	1	-
I am very careful who I say that I am working with patients/samples with COVID-19	35 (42.7)	44 (53.7)	11 (24.4)	6 (13.3)	2.333	1	0.127
Most people are uncomfortable around someone who works with COVID-19 patients/samples	60 (73.2)	22 (26.8)	22 (48.9)	11 (24.4)	0.486	1	0.486
Some people avoid touching me once they know I am working with patients/samples with COVID-19	44 (53.7)	36 (43.9)	25 (55.6)	8 (17.8)	4.234	1	0.04*
People I care about stopped calling after learning I am working with patients/samples with COVID-19	11 (13.4)	67 (81.7)	8 (17.8)	26 (57.8)	1.494	1	0.222
I have lost friends by telling them I am working with patients/samples with COVID-19	4 (4.9)	75 (91.5)	3 (6.7)	25 (55.6)	1.08	1	0.375
I would have preferred to not work if given a choice	10 (12.2)	71 (86.6)	12 (26.7)	25 (55.6)	6.756	1	0.009*

P<0.05, χ^2: Pearson's Chi-squared value, df: Degrees of freedom

were used, it is possible that some respondents may have been reluctant to share their true concerns and beliefs due to the sensitive nature of the issues discussed. The relatively small sample size may affect the generalizability of the results. The simple random design of sample selection was chosen for the ease of the method; we acknowledge that this could have led to sampling errors. Nurses who are an integral part of the frontline team were not included.

CONCLUSIONS

This study highlights the prevalence of psychological distress among HCWs during the pandemic. The risk factors identified need to be validated during long-term follow ups. The results of this study will help plan and develop effective interventions for HCWs during and following the pandemic.

Research quality and ethics statement

The authors of this manuscript declare that this scientific work complies with reporting quality, formatting and reproducibility guidelines set forth by the EQUATOR Network. The authors also attest that this clinical investigation was determined to require Institutional Review Board/Ethics Committee review, and the corresponding protocol/approval number is IRB Min. No. 13062 dated July 22, 2020. We also certify that we have not plagiarized the contents in this submission and have done a Plagiarism Check.

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Conflicts of interest

There are no conflicts of interest.

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