Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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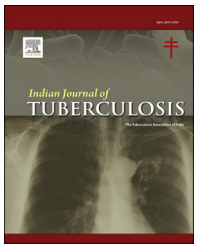

Original article

From stress to stigma – Mental health considerations of health care workers involved in COVID19 management

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ABSTRACT

Background: Healthcare workers (HCWs) involved in administration and patient management during COVID-19 pandemic are at high risk of developing psychological problems related to fear and stress of contacting COVID infection. This is augmented by the stigma faced at home and society, owing to the nature of their job.

Aim: To assess the mental health issues and stigma amongst health care workers involved in COVID care.

Methodology: We conducted a hospital based cross sectional study where 150 health care workers involved in the care of COVID-19 patients, directly and indirectly, were selected using systematic random sampling. They were assessed using Depression, Anxiety and Stress Scale (DASS-21) Hindi Version, The Impact of Event Scale - Revised scale and a Modified Stigma scale.

Results: Significant psychological stress, anxiety, depression and high risk for developing post-traumatic stress disorder was found in more than half of the healthcare workers, albeit more in those having direct contact with COVID patients ($p < 0.05$). Stigma was significantly reported in most HCWs, especially with concerns regarding public attitude and disclosure of their work profile.

Conclusion: Healthcare Workers are at a higher risk for developing psychological disorders and post-traumatic stress disorder because of the immensely stressful work-related conditions and stigma related to working with COVID patients. This may lead to long lasting psychosocial consequences which may affect more severely than the infection itself. Early identification of psychological issues of HCWs and timely intervention is the key.

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1. Introduction

COVID-19 is a highly infectious illness and is being faced for the first time by humanity, thereby generating a lot of uncertainty among public and health care workers.[1] This uncertainty breeds fear, panic and stress across all strata of community, including healthcare workers (HCWs). It is further augmented by increasing number of COVID 19 cases, limited resources and overburdened healthcare infrastructure, lack of specific treatment and inadequate support from public and the organizations.[2,3] This increased burden on healthcare facilities and restrictive measures taken by agencies have had significant psychological impact on healthcare professionals.[4]

It is worth considering that HCWs are exposed to a higher risk of infection, burnout and psychological distress.[5] Fear among families of HCWs, need for quarantine after exposure, long working hours and stigma related to their work involving contact with highly infectious virus may adversely affect the HCWs mental health. Consistent stress related to work, guilt of exposing family members and facing stigma may result in reduced efficiency, burnout and a basket of psychological disorders.

HCWs involved in COVID-19 management have faced and reported multiple instances of social isolation, refusal of public transportation use, public insults or harassment and getting evicted from housing places.[6] The stigma related to HCWs drive mostly from fear of infection, concerns about stereotypic social image (beliefs associated with being a HCW), discrimination (social avoidance during daily activities, for example, shopping), prejudice (devaluation of HCWs) and self-blame.[7,8] Stigma and related discrimination can further affect motivation to work, increase stress and impair psychological well-being. In spite of such instances and seriousness of events, psychological problems and stigma related to HCWs dealing with COVID-19 patients hasn't been adequately studied.[9]

To our understanding, research evaluating the impact of COVID -19 on psychological health and stigmatization among HCWs is scarce, on both National (India) and Global level. So the study was planned to understand mental health issues of HCWs involved in care of patients and stigma faced by them. Knowledge gained about mental status and stigma can be used for early identification of psychological burnout, prompt treatment, development of targeted public awareness programs and policies to reduce stigma, with an aim to enhance mental wellbeing of health care workers. It may also help the concerned authorities to understand needs of HCWs and address the issue effectively.

2. Materials and methods

We conducted a hospital based cross-sectional study at a tertiary care hospital in Northern India which is a dedicated COVID hospital. All the health care workers (Doctors, Nurses, Para-medical staff) involved in COVID-19 management (Direct/Indirect) in this institution satisfying the inclusion and exclusion criteria were considered for inclusion in the study. The study was approved by the Institutional Ethics Committee.

A total of 332 health care workers were approached for inclusion in the study. Systematic random sampling method was followed and every 2nd consenting HCW was approached for inclusion in the study. The health care workers willing to give written informed consent, involved directly in COVID-19 patient care or managerial/administrative work were included in the study. Participants not willing to give written informed consent, and with any prior/present history of psychiatric illness or cognitive disturbance (assessed clinically) were excluded. 14 HCWs did not give consent for inclusion while 18 HCWs had past/present history of significant psychiatric disorders and were thus excluded from the study. Hence, a sample of 150 HCWs were included and interviewed. The study participants were approached individually in their respective departments and were asked to participate in the study. A written informed consent was obtained from the eligible participants. The participants were categorized into two groups:

Category 1: HCWs who were involved directly in COVID-19 patient care.
Category 2: HCWs who were involved in managerial/administrative duties.

The information was collected using self-reported questionnaire and semi-structured proforma which included the following:-

1. **Socio-demographic Proforma**
2. **The Impact of Event Scale – Revised (IES-R):**This isa self-reported questionnaire, which comprises of twenty two questions to assess Diagnostic and Statistical Manual of Mental Disorders (DSM) criteria for Post Traumatic stress disorder (PTSD). Although there is no specific cut-off score, scores more than 24 are of concern and suggest risk of developing PTSD. The IES-R in itself is not diagnostic. The higher the score the greater is concern for PTSD and associated health consequences.[10]
3. **Depression, Anxiety and Stress Scale – 21 (DASS-21) Hindi Version:** The DASS- 21 consists of three self-report scales which measure the emotional states of depression, anxiety and stress. Each of the three scales contains seven items which are further divided into subscales with similar content. All twenty one items are rated on four-point scale ranging from 0 to 3 (0 –did not apply to me at all and 3 –applied to me most of the time). The Hindi translation demonstrated a strong internal consistency and good construct validity.[11,12]
4. **Modified Stigma scale (adapted from Verma et al)**–We did not find any specific scale to measure COVID-19-related stigma. The closest tool available was developed by Verma et al.[13] to measure stigma among HCWs during the 2004 SARS epidemic in Singapore, which in itself was adapted from the HIV Berger scale.[14] This scale had 17 items which were categorized into 4 domains – personalized stigma; disclosure concerns; negative self-image; and concern with public attitudes. The items were scored as per Likert responses ranging from 1 “strongly disagree” to 4 “strongly agree”. The overall score ranged from 17 to 68, with a higher score indicating a higher level of stigma. The

Cronbach's alpha was 0.906, suggesting high internal consistency. Some questions were common to more than one domain (Picture 1). The items in each domain were personalized stigma (11 items), disclosure concerns (4 items), negative self-image (3 items), and concern with public attitude about HCWs (10 items).

5. **Self-stigma**–'I feel guilty of exposing my family to COVID-19 infection'. One question regarding with a possible YES or NO reply.

The data was collected and analyzed using the SPSS version 20. Descriptive statistics and percentage was used for computation of the categorical variables. Unpaired t test was used to analyze the significance of difference between categories of continuous variables. The p-value less than 0.05 was taken for significance.

3. Results

A total of 332 participants were approached for inclusion in the study. Every second consenting participant was screened for inclusion and exclusion criteria by the authors. 14 HCWs did not give consent for inclusion while 18 HCWs had past/present history of significant psychiatric disorders and were excluded. Hence, a sample of 150 HCWs were included and interviewed.

The mean age of study population was 36.63 ± 14.17 years and about 50% of study population was between 31 and 59 years of age group. Among the HCWs, 33.3% were doctors, 30% nursing staff, 18% lab technician and 18.7% were other paramedical staff. Among the participants, 64% were male and 36% were females (Table 1).

We found that around 45% HCWs had moderate to severe amount of stress, while around 41% reported moderate to severe anxiety. Depressive symptoms ranging from moderate to severe extent were reported by approximately 50% of the HCWs. IES-R scores of greater than 24 were reported by around 63% of the HCWs suggesting high risk of burnout and PTSD in future (Table 2).

Table 1 – Socio-demographics details of study participants.

Demographic Groups		N (150)	Frequency (n%)
Age	Less than 30	66	(44)
	31–59	76	(50.6)
	Above 60	8	(5.4)
	Mean ± S.D.		36.63 ± 14.17
Gender	Male	96	(64.0)
	Female	54	(36.0)
Marital Status	Unmarried	41	(27.3)
	Married	109	(72.7)
Education	Up to Std 8th	27	(18.0)
	Std 9th to 12th	31	(20.7)
	Graduate	52	(34.7)
	Postgraduate	40	(26.7)
Occupation	Doctor	72	(48.0)
	Nursing Staff	40	(26.0)
	Lab Technician/	22	(14.6)
	Others	16	(10.6)
Role in COVID	Direct Contact	90	(60.0)
	Administration	60	(40.0)

Table 2 – Prevalence of psychological issues among Health Care Workers (N = 150).

Variable	Stress	Depression	Anxiety
Normal	27 (18.0%)	25 (16.7%)	24 (16.0%)
Mild	55 (36.7%)	49 (32.6%)	62 (41.4%)
Moderate	52 (34.7%)	64 (42.7%)	40 (26.7%)
Severe	16 (10.7%)	12 (8.0%)	24 (16.0%)
IES-R Scores	**IES-R Scores(<24)**	**IES-R Scores(>24)**	**Total**
	55 (36.7%)	95 (63.3%)	150

IES-R – Impact of Event Scale Revised.

Females and young HCWs (less than 30 years) reported significantly more stress than males and those HCWs aged above 30 years ($p < 0.05$). Depression was significantly more in HCWs who were married and belonged to medical field (Doctors and Nurses). HCWs who were in direct contact with COVID-19 patients had significantly higher anxiety, stress and depression scores compared to those in administrative work, although both groups reported moderate to severe psychological distress (Table 3).

HCWs dealing directly with COVID-19 patients had significantly higher IES-R scores ($p < 0.5$). Among 90 healthcare workers who were directly attending COVID patients, 74 reported IES-R score more than 24. The mean IES scores of participants was 27.19 ± 7.14. Significantly high levels of stigma was faced and perceived by HCWs attending to COVID-19 patients (Mean score of 42.8 out of maximum score of 68), specially with regards to disclosure concerns and concerns about public attitude (Table 4). HCWs involved in direct management of COVID-19 patients experienced more stigma than those involved in administrative posts. About 75% HCWs felt guilty of exposing their families to COVID-19 infection (self-stigma).

4. Discussion

Our study tried to assess the psychological impact of managing COVID-19 pandemic among HCWs, ranging from simple stress to severe depression. We also evaluated how HCWs feel stigmatized because of public perception about their work with patients, negative image of themselves and feeling guilty towards exposing their families. We found that majority of HCWs involved in COVID care, directly and indirectly, have experienced moderate to severe psychological distress.

Moderate to severe psychological problems like stress, anxiety, depression and risk of developing PTSD were found in more than 50% of respondents. Few studies have reported high levels of PTSD among HCWs who had been quarantined.[15] A review by d'Ettorre et al concluded that COVID-19 pandemic is highly likely to promote stress disorders in HCWs, potentially degenerating into chronic PTSD. It also showed the need for urgent interventions aimed at protecting HCWs from the psychological impact of traumatic events.[16] A systematic review by Li et al estimated the pooled prevalence of moderate depression, anxiety and PTSD among

Table 3 – Correlates of stress, anxiety, depression and IES-R among Health Care Workers (N = 150).

Variable		Mean score	T	p-value
Age				
Stress	Age <30 years (n = 66)	9.91 ± 2.44	2.28	0.026*
	Age >30 years (n = 84)	9.04 ± 2.23		
Anxiety	Age <30 years	6.74 ± 2.80	−0.96	0.339
	Age >30 years	7.19 ± 2.86		
Depression	Age <30 years	9.06 ± 2.50	−0.30	0.765
	Age >30 years	9.19 ± 2.72		
IES-R score	Age <30 years	27.29 ± 6.93	0.143	0.886
	Age >30 years	27.12 ± 7.33		
Gender				
Stress	Male (n = 96)	9.13 ± 2.32	−1.99	0.048*
	Female (n = 54)	9.92 ± 2.35		
Anxiety	Male	6.90 ± 2.87	−0.50	0.617
	Female	7.14 ± 2.78		
Depression	Male	9.11 ± 2.59	−0.11	0.907
	Female	9.16 ± 2.68		
IES-R score	Age <30 years	27.29 ± 6.93	0.143	0.886
	Age >30 years	27.12 ± 7.33		
Marital status				
Stress	Unmarried (n = 41)	9.53 ± 2.50	0.37	0.711
	Married (n = 109)	9.37 ± 2.31		
Anxiety	Unmarried	6.60 ± 2.61	−1.01	0.309
	Married	7.13 ± 2.91		
Depression	Unmarried	8.78 ± 2.68	−2.01	0.046*
	Married	9.26 ± 2.59		
IES-R score	Unmarried	27.29 ± 6.96	0.104	0.917
	Married	27.16 ± 7.24		
Designation of Health Care Workers				
Stress	Paramedical (n = 78)	9.38 ± 2.28	−0.19	0.849
	Medical (n = 72)	9.45 ± 2.44		
Anxiety	Paramedical	6.84 ± 2.95	−0.66	0.510
	Medical	7.15 ± 2.71		
Depression	Paramedical	8.73 ± 2.51	−1.97	0.050*
	Medical	9.56 ± 2.68		
IES-R score	Paramedical	27.47 ± 6.89	0.5	0.618
	Medical	26.89 ± 7.44		
Role in COVID				
Stress	Direct (n = 90)	10.05 ± 2.32	4.27	0.000*
	Administration (n = 60)	8.46 ± 2.08		
Anxiety	Direct	7.70 ± 2.51	3.91	0.000*
	Administration	5.93 ± 2.97		
Depression	Direct	9.57 ± 2.37	2.58	0.010*
	Administration	8.46 ± 2.85		
IES-R score	Direct	29.75 ± 6.15	5.97	0.010*
	Administration	23.35 ± 6.83		

IES-R – Impact of Event Scale-Revised.
* – Significant at p-value <0.05.

HCWs across 65 studies (21 countries) to be 21.7%, 22.1% and 21.5% respectively.[17]

Our study findings are in concordance with the previous literature which showed that most common psychiatric disorders diagnosed among HCWs during pandemic were depression, anxiety and post-trauma stress syndrome.[18] Medical staff (doctors and nurses) reported significantly higher depressive symptoms as compared to paramedical staff. Studies have reported nurses and doctors to have higher levels of stress, anxiety and depression.[5,19,20]

We found that married HCWs have more stress, anxiety and depression as compared to unmarried which might be because of increased proportion of married HCWs in the study sample or their persistent worries about their family members along with their own burnout. Young and female HCWs reported greater psychological symptoms as compared to males. This is similar to previous research findings where female nursing staff with close contact to COVID-19 patients were found to have the highest mental health risks.[19,21] Another study on COVID-19 reported similar results of higher risk of PTSD and psychological problems for the younger age, female gender and being married.[3,16,22]

Besides the direct psychological impact of stress, fear, anxiety and PTSD, COVID-19 has also led to the emergence of significant stigma. Stigma may be perceived by HCWs in the public's attitude towards them (perceived stigma) or HCWs

Table 4 – Stigma Perceived by Health Care Workers related to COVID-19.

Variable	Number of items	Total possible score	Total Mean Score ± SD	Role in COVID (N = 150)		T value	P value
				Direct (N = 90)	Administration (N = 60)		
				Mean ± SD	Mean ± SD		
Personalized stigma	11	44	28.40 ± 5.7	28.5 ± 5.6	28.25 ± 5.8	0.264	0.792
Disclosure concerns	4	16	9.50 ± 1.9	9.9 ± 1.9	8.9 ± 2.1	3.02	0.002*
Negative self-image	3	12	6.20 ± 1.8	6.3 ± 1.7	6.05 ± 1.9	0.841	0.401
Concern with public attitude	10	40	28.4 ± 4.7	29.6 ± 4.7	26.6 ± 4.8	3.797	0.000*
Total stigma score	17	68	42.8 ± 7.9	43.90 ± 7.7	41.15 ± 8.2	2.088	0.035*
Self-Stigma[a] (N = 150)	Yes (N %) 112 (74.66)				No (N %) 38 (25.34)		

SD - Standard Deviation.
* – Significant at p-value <0.05.
[a] Assessed by question 'I feel guilty of exposing my family to COVID-19 infection'.

may hold themselves in negative light and feel guilty (self-stigma). We found that HCWs at our center perceived significantly high levels of stigma and most of them felt guilty of exposing their families to COVID-19 infection. Those directly working with COVID-19 patients had greater concerns regarding disclosing their work to friends and public and their attitude towards them.

The concerns regarding stigma towards HCWs are similar to condition like HIV, where HCWs reported that they have been forced to leave the neighborhood and denied access to their houses and the families have been threatened.[23] Tandon reported that anyone who is involved in providing direct care to COVID-19 patients was treated as untouchable, health-care providers are being labeled and discriminated at different places.[24]Stigma against HCWs has been reported in many different countries, including developed countries.[5,6] The stigma related to HCWs drive mostly from fear of infection, concerns about stereotypic social image (beliefs associated with being a HCW), discrimination (social avoidance during daily activities, for example, shopping), prejudice (devaluation of HCWs) and self-blame.[7,8]

We tried to provide counseling and psychological support to HCWs included in the study. Around 10% agreed and sought treatment for their distress. This proportion seems grossly insufficient considering that most of the HCWs reported significant psychological distress. The possible reasons may be lack of motivation, stigma associated with psychiatry treatment and lack of time. Our study is amongst only a few which have tried to evaluate mental health and stigma in HCWs during COVID-19 pandemic in India. The study included HCWs from different strata across hospital, and those who were directly and indirectly involved in the COVID-19 care. It also included various aspects of stigma faced by HCWs, supported by robust methodology. The study had certain limitations which may prevent the generalizability of results. It included small sample size, lack of tool specific to measure stigma related to COVID-19, cross sectional study design which does not allow causal inferences and possibility of recall and reporting bias. Further studies are needed to address these shortcomings and cover the existing gaps in knowledge.

Healthcare Workers are particularly at higher risk for psychological disorders because of the highly stressful work-related conditions they face while managing patients, which include management of critical situations, caring for severely traumatized people, frequent witnessing of death and trauma, operating in crowded and limited resource settings, interrupted circadian rhythms due to shift work.[25,26] The COVID-19 outbreak has created social stigma and discriminatory behavior towards the frontline health care workers. This may lead to long lasting psychosocial consequences that may persist longer than the infection itself. Early identification of psychological issues of HCWs and timely intervention is the key towards better mental health in these hard times. This may be done in form of providing specific psychological support to HCWs, adequate rest between duties, shorter shifts and sufficient logistics. Increasing and mobilizing resources to the needy areas, and enhanced community awareness might be helpful.

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Conflicts of interest

The authors have none to declare.

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