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Perceived stress and coping capacities among frontline healthcare workers of AIIMS during COVID−19 pandemic: A cross−sectional study

Mudita Sharma[1], Digpal Singh Chundawat[1], Rohit Richhariya[1], Sunil Kumar Tailor[1], Shatrughan Pareek[2]✉

[1]*AIIMS, Bhopal, India*

[2]*Indian Railway Health Services, Bikaner, Rajasthan, India*

ABSTRACT

Objective: To assess perceived stress and coping capacity of frontline health workers from AIIMS during COVID-19 pandemic.

Methods: This cross-sectional study conducted from May to July 2021 enrolled 694 participants. An online questionnaire based on Google Forms was developed to collect the data. Participants were assessed using the validated Perceived Stress Scale and the Coping Resources Inventory Scale.

Results: The age of participants were 27 (23-52) years old. The majority of respondents (73.5%) felt moderately stressed. Of the 694 participants, 83.0% of the 576 participants had average stress management skills. Sex, marital status, and profession were significantly associated with perceived stress. In addition, marital status and profession were significantly associated with coping capacity.

Conclusions: The majority of participants have moderate stress levels and average coping skills. Frontline healthcare workers have to maintain mental and physical health. Achieving this requires early screening and stress management for healthcare workers.

KEYWORDS: COVID-19; Prevalence; Perceived stress; Coping capacity; Frontline health workers; Mental health

1. Introduction

Severe acute respiratory syndrome (SARS-CoV-2) causes coronavirus disease 2019 (COVID-19) and affects the respiratory system of the human body. COVID-19 disease spreads in human beings through close contact and respiratory droplets[1]. Globally 752 517 552 COVID-19 cases were confirmed and 6 804 491 deaths (WHO dashboard census on 26th January 2023)[2]. In India, the first case of the coronavirus was detected on 30 January 2020 in Kerela[3]. Corona pandemic situation leads to high public reactions and creates a variety of concerns for the public resulting in several mental health issues like stress, anxiety, and emotional instability. Anxiety or crisis in the population is a common response to a stressful situation, especially among frontline healthcare workers like physicians, nurses, and medical staff directly involved in the screening, diagnosis, and care of COVID-19 patients[4]. With the increasing numbers of positive and suspected cases, healthcare providers find themselves with overwhelming workloads, deficiencies in personal protective types of equipment, inadequate knowledge of personal safety devices, and shortages of particular medicines[4]. The fear of getting an infection in working place may lead to psychophysiological hazards, such as mental distress,

Significance

Our research highlighted that during to COVID-19 pandemic, the healthcare professionals have experienced stress and their coping strategies were not sufficient to deal with the stress. There is a need to develop and implement stress management and coping strategies program to deal with psychological problem related to the pandemic.

✉To whom correspondence may be addressed. E-mail: shatrughan.pareek@gmail.com

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fatigue, professional burnout, anxiety, and stress[5]. Brooks *et al* noted that during the 2003 SARS outbreak, healthcare workers feared they would infect their family or friends and felt stigmatized because they were known to be in close contact with sick patients. They experienced significant long-term stress[6]. Similar fears are probably contributing to healthcare workers' distress now since they are at a higher-than-average risk of contracting COVID-19[7]. Thus, assessment of perceived stress and coping capacities of the frontline healthcare providers is very important to understand mental health response of healthcare providers during the COVID-19 pandemic, which will help healthcare providers to prepare themselves for their response in such medical emergencies in the future.

2. Patients and methods

2.1. Study design

This cross-sectional study was conducted from May 31, 2021, to July 24, 2021, among frontline healthcare workers from All India Institute of Medical Sciences (AIIMS) hospital, Bhopal, India. There are about 1 200 health workers in AIIMS hospitals and 742 participants were enrolled in the study.

2.2. Inclusion and exclusion criteria

Healthcare workers who were willing to participate, present at the time of data collection, and literate in Hindi or English were enrolled. A total of 742 participants were enrolled using a non-randomized targeted sampling technique. Healthcare workers who were critically ill, having stress, or psychological problems, had not completed the data collection tools, didn't respond, and did not present at data collection time were excluded. Out of 742 participants, 694 participants responded to the study. The response rate was 93.53%.

2.3. Data collection

A self-administered online questionnaire based on Google Forms was developed for data collection. Data collection was performed using three tools. The first tool was a demographic questionnaire that included demographic and occupational characteristics, such as age, sex, marital status, education, occupation, experience in the hospital work environment and work area before the COVID-19 pandemic, and present work area i.e. ward/ICU/operation theatre, *etc*. The second and third tools were the Perceived Stress Scale (PSS), used to assess stress levels, and the Inventory Coping Resource Scale used to assess the coping capacity of healthcare workers. Individual PSS score ranges from 0 to 40, higher scores indicate higher perceived stress. Scores ranging from 0-13 would be considered low stress, 14-26 as moderate stress, and 27-40 as high perceived stress. The scores of coping capacity were further categorized as average, average, above average, and superior coping. The categories were prepared after an intensive review of literature[8]. Google forms were prepared for data collection and links were distributed *via* WhatsApp group of medical professionals and email. The tool was written in English and Hindi, translated, and verified by language experts.

2.4. Ethical statement

Formal written ethical approval was obtained from the Research Ethics Committee of AIIMS Bhopal before data collection. This study was approved by the Institutional Human Ethics Committee, AIIMS Bhopal, with approval number IHEC-LOP/2021/IM0286 dated 26 February 2021. The participant was asked to provide an informed consent form and record it online before completing the survey. The survey was conducted anonymously and the information was kept confidential.

2.5. Statistical analysis

The sample size was estimated by using the formula $(Z_{(1-\alpha/2)})^2$ (p) $(q)/d^2$[5] with a 5% margin of error, 95% confidence interval, and

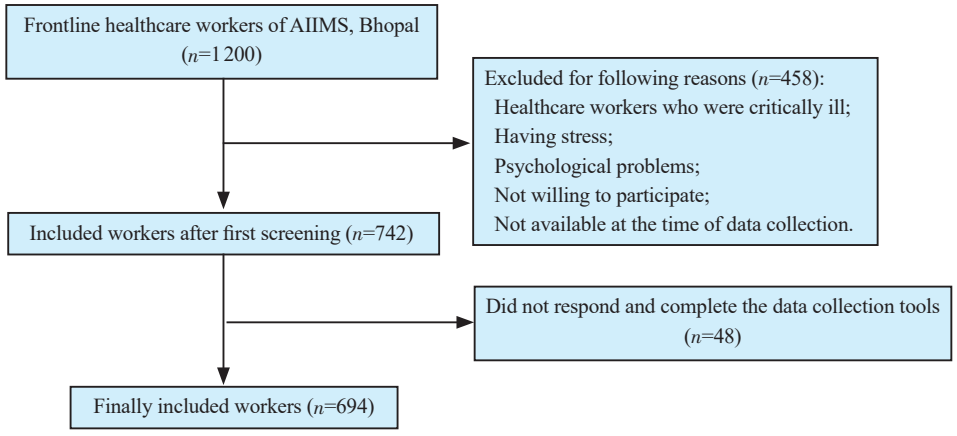

Figure 1. Flow diagram.

prevalence was taken from the previous study[4,6], which was nearly 75%. The estimated minimum sample size was 289.

SPSS 21.0 version was used. Data were presented as frequency and percentage. Chi-square test was used to analyze. The difference was considered significant as $P<0.05$.

3. Results

3.1. Demographic and clinical characteristics

A total of 694 Health care workers participated in the study (Figure 1). Most of the participants were aged 20-30 years old (75.5%), followed by the 31-40 age group (22.5%). Participants consisted primarily of 602 registered nurses (86.7%), followed by 66 physicians (9.5%). Out of 694 participants, 434 (62.5%) respondents have 1-3 years of experience, followed by 150 (21.6%) with 4-6 years of experience. A total of 310 (44.7%) also said they worked in the COVID ward, and 568 (81.8%) received pre-deployment training on how to put on, take off and use personal protective equipment. Regarding marital status, most of the respondents were married (59.9%), and 510 of them (73.5%) had college degrees (Table 1).

3.2. Perceived Stress Scale score

The majority (73.5%) of respondents have a moderate level of stress followed by 19.9% having high stress, and only 6.6% of participants had low stress.

3.3. Coping Resource Scale

A total of 96 (13.81%) healthcare workers had stress coping capacities below average, 576 (83%) participants had average stress coping capacities, 20 (2.9%) respondents had above average Stress coping capacities and only 2 (0.3%) are superior stress coping.

3.4. Association between demographic variables and stress levels

Table 2 shows the association between selected demographic variables and levels of stress. Sex ($P<0.001$), marital status ($P=0.012$), and profession ($P<0.001$) were significantly associated with levels of stress.

3.5. Association of demographic variables with coping capability

Table 3 shows the association between demographic variables and levels of coping capabilities. Marital status ($P<0.001$) and profession ($P<0.001$) were highly significantly associated with levels of coping capabilities.

Table 1. Demographic and clinical characteristics (n=694).

Variables	*n*	%
Age (years)		
20-30	522	75.2
31-40	158	22.8
41-50	12	1.7
Above 50	2	0.3
Sex		
Male	476	68.6
Female	218	31.4
Marital status		
Married	416	59.9
Unmarried	268	38.6
Divorced/Separated	10	1.4
Education		
Diploma	38	5.5
College degree	510	73.5
Postgraduate	136	19.6
Ph.D./ Doctorate	10	1.4
Profession		
Physician	66	9.5
Nurse	602	86.7
Others	26	3.8
Working experience in a hospital setting (years)		
1-3	434	62.5
4-6	150	21.6
7-9	60	8.6
More than 9	50	7.2
Working area before COVID pandemic		
ICU/Emergency	162	23.3
Operation theatre	48	6.9
Ward	340	49.0
Outpatient departments/Others	144	20.7
Present working area		
COVID screening area	66	9.5
COVID ward	310	44.7
COVID ICU	256	36.9
COVID operation theatre	4	0.6
Other COVID area	58	8.4

4. Discussion

Healthcare workers are playing an important role in the management of COVID-19 pandemic. The psychological status of healthcare workers becomes worse during the COVID-19 pandemic. Literature has indicated considerable individual and group psychological effects following epidemics and outbreaks. The globe is experiencing a shutdown or slowdown in daily operations as a result of the COVID-19 epidemic, yet healthcare professionals must maintain their job routines[9,10].

This study aimed to assess perceived stress and coping capability among healthcare workers during the COVID-19 pandemic in the west-central part of India. In this study, 73.5% of respondents had moderate perceived stress. This finding was similar to the result of a multination study, where a majority of the population suffered from moderate stress[11]. Yubonpunt *et al* conducted research among 517 healthcare workers to assess perceived stress. The prevalence of perceived stress was 41.97%[12]. In contrast, another study in

Table 2. Association between demographic variables and levels of stress (n=694).

Variables	Perceived Stress Scale score			χ^2	*P*
	Low stress	Moderate stress	High stress		
Age (years)					
20-30 (n=522)	34	386	102	4.627	0.592
31-40 (n=158)	10	116	32		
41-50 (n=12)	2	6	4		
Above 50 (n=2)	0	2	0		
Sex					
Male (n=476)	20	336	120	36.806	0.001
Female (n=218)	26	174	18		
Marital status				12.802	0.012
Married (n=418)	20	308	90		
Unmarried (n=266)	24	198	44		
Divorced/Separated (n=10)	2	4	4		
Education				10.576	0.102
Diploma (n=38)	0	28	10		
College degree (n=506)	30	376	100		
Postgraduate (n=138)	14	100	24		
Ph.D./Doctorate (n=12)	2	6	4		
Profession				27.967	0.001
Physician (n=64)	14	38	12		
Nurse (n=606)	32	454	120		
Others (n=24)	0	18	6		
Working experience in a hospital setting (years)					
1-3 (n=432)	30	322	80	8.451	0.207
4-6 (n=150)	4	112	34		
7-9 (n=60)	6	42	12		
More than 9 (n=52)	6	34	12		
Working area before COVID pandemic					
ICU/Emergency (n=162)	12	124	26	3.391	0.758
Operation theatre (n=48)	4	32	12		
Ward (n=340)	22	250	68		
Outdoor patient department (n=144)	8	104	32		
Present working area					
COVID screening area (n=68)	2	54	12	11.048	0.199
COVID ward (n=310)	16	228	66		
COVID ICU (n=254)	22	188	44		
COVID operation theatre (n=4)	0	4	0		
Other COVID area (n=58)	6	36	16		

Iran highlighted that the prevalence of perceived stress was lower compared to the present study[13]. Lee *et al* stated that there was a considerable increase in perceived stress levels among healthcare workers[14]. To cope with stress due to COVID-19, a wide range of coping strategies have been reported. Although the patterns are different depending on the context, culture, and the situation of an outbreak, the choice of positive and problem-oriented coping strategies was the most common in previous studies[15]. In our study, 576 (83.0%) participants had average stress-coping capacities. Some studies also revealed that medical and healthcare students have good or positive coping strategies to overcome stress or mental health problems[16,17].

Variables like sex, marital status, and profession have a highly significant association with perceived stress. Kowal *et al* also stated that married status has a significant association with stress levels[18]. Ali *et al*. reported that sex and profession were significantly associated with the level of stress[19]. Certain demographic variables like age, year of experience, and previous working area have no significant association with stress and coping capability in our study. In contrast, a study conducted in Saudi Arabia revealed that age, education level, and years of experience are associated with stress and coping capability.

The main limitation of this study is that it was conducted in a single higher specialized center in Bhopal. This study was conducted in an online mode, which was another limitation of the study.

Medical staff is under great strain and emotional stress due to the highly contagious nature of COVID-19 and the lack of understanding of the effect on physical and mental health. The current study concluded that most participants (73.5%) had moderate levels of stress and the majority (83.0%) had average coping skills. Hospital administrators should pay particular attention to the mental health of healthcare workers. Psychological counseling and crisis psychological interventions must be provided to improve the mental health of nursing staff. With certain restrictions, stress is evitable.

Table 3. Association between demographic variables and levels of coping capabilities (n=694).

Variables	Inventory Coping Resource Scale				χ^2	*P*
	Below Average	Average	Above average	Superior		
Age (years)						
20-30 (n=522)	2	16	458	46	4.944	0.839
31-40 (n=158)	0	4	146	8		
41-50 (n=12)	0	0	10	2		
Above 50 (n=2)	0	0	2	0		
Sex						
Male (n=476)	2	12	416	46	6.695	0.082
Female (n=218)	0	8	200	10		
Marital status						
Married (n=418)	0	12	380	26	143.935	0.001
Unmarried (n=266)	0	8	230	28		
Divorced/Separated (n=10)	2	0	6	2		
Education						
Diploma (n=38)	0	0	38	0	15.194	0.086
College degree (n=506)	2	20	438	46		
Postgraduate (n=138)	0	0	130	8		
Ph.D./ Doctorate (n=12)	0	0	10	2		
Profession						
Physician (n=64)	2	2	58	2	24.676	0.001
Nurse (n=606)	0	18	538	50		
Others (n=24)	0	0	20	4		
Working experience in a hospital setting (years)						
1-3 (n=432)	2	12	378	40	4.106	0.904
4-6 (n=150)	0	4	136	10		
7-9 (n=60)	0	2	54	4		
More than 9 (n=52)	0	2	48	2		
Working area before COVID pandemic						
ICU/Emergency (n=162)	2	2	140	18	16.391	0.059
Operation theatre (n=48)	0	4	40	4		
Ward (n=340)	0	10	308	22		
Outdoor patient department/Others (n=144)	0	4	128	12		
Present working area						
COVID screening area (n=68)	0	0	62	6	7.495	0.823
COVID ward (n=310)	0	10	278	22		
COVID ICU (n=254)	2	8	220	24		
COVID operation theatre (n=4)	0	0	4	0		
Other COVID area (n=58)	0	2	52	4		

Conflict of interest statement

The authors report no conflict of interest.

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Authors' contributions

MS, DSC, RR, SKT, and SP have designed and conducted the study, data analysis, preparing and designing the manuscript. SP would act as the corresponding author of the manuscript.

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