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"PERCEIVED STRESS AND MINDFULNESS-BASED COPING STRATEGIES AMONG HEALTHCARE WORKERS IN INDIA DURING COVID-19"

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ABSTRACT

Background:
The COVID-19 pandemic greatly affected healthcare systems globally, creating mental health issues for healthcare workers (HCWs). This research aimed to assess the perceived stress levels and coping mechanisms of healthcare workers in India throughout the pandemic.

Materials and Methods:
A cross-sectional study of HCWs engaging in COVID-19 care was undertaken across India between August and November 2020. Participants filled out an online survey that included a part on coping mechanisms and the Perceived Stress Scale (PSS-10). The data were summarised using descriptive statistics, and the relationships between stress levels and demographic characteristics were examined using a one-way ANOVA.

Results: Out of 169 respondents (58% female, mean age: 29.98 ± 8.76 years), 75% reported moderate-to-severe stress levels (PSS score mean: 16.17 ± 5.8). Females and frontline workers exhibited higher stress levels compared to their counterparts ($p < 0.05$). Yoga and pranayama (63.9%), exercise (42.6%), and meditation (41.4%) were the most commonly adopted coping strategies.

Conclusion: The findings highlight a high prevalence of stress among HCWs during the COVID-19 pandemic, emphasizing the need for institutional stress management programs incorporating yoga, mindfulness, and relaxation techniques. These strategies could help mitigate stress and enhance the resilience of HCWs during public health crises.

Keywords: COVID 19; Health Care Workers; Stress; Coping strategies; India

1. Introduction

The COVID-19 pandemic, caused by Severe Acute Respiratory Syndrome-Coronavirus-2 (SARS-CoV-2), posed unprecedented difficulties to healthcare systems throughout the world owing to its rapid transmission, asymptomatic spread, and global scope. **[1]**

The first instances were recorded in December 2019 in Hubei Province, China, and by January 2021, the virus has caused approximately 98 million confirmed cases and 2.1 million fatalities worldwide. **[2,3]**

In India, the first confirmed case was reported on January 30, 2020, in Kerala, and as of January 2021, the country had recorded over 10 million cases. **[4]** The state-wise confirmed cases in India are shown in the Map below (Figure.1).

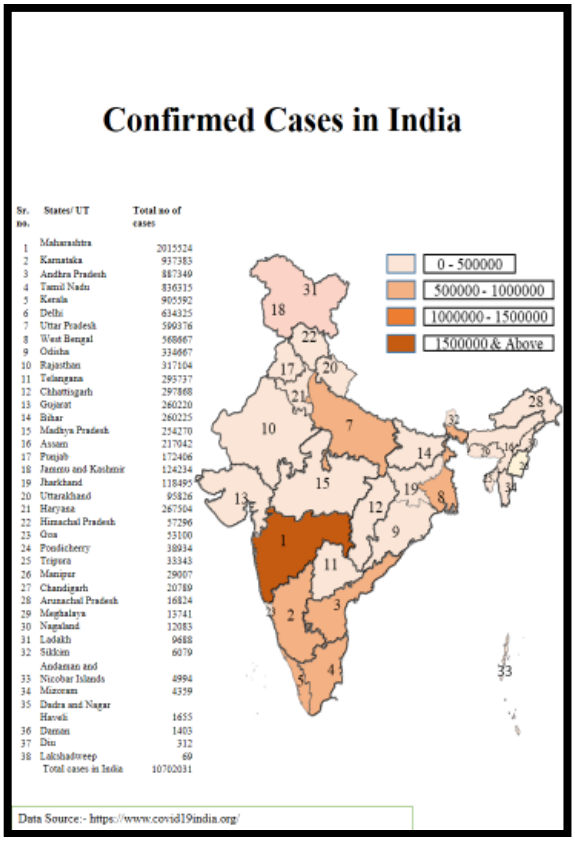

Figure 1. State-wise confirmed cases in India till 27th January 2021

As the COVID-19 virus transmits from person-to-person through direct contact, droplets and has an incubation period of 2-14 days. **[5]**

Healthcare workers (HCWs) have borne a disproportionate burden of the pandemic, serving as the first line of defense while facing significant physical and mental health risks. Prolonged exposure to infected patients, lack of personal protective equipment (PPE), social stigma, and uncertainty about treatment protocols have contributed to high levels of stress and psychological distress among HCWs.**[6,7]** Furthermore, increased workloads and isolation from family members have exacerbated their mental health challenges, often leading to burnout. **[8]**

While global studies have documented the psychological impact of COVID-19 on HCWs, limited research has explored the stress levels and coping strategies among HCWs in India. Given the unique healthcare landscape and societal factors in India, understanding these dynamics is crucial for developing tailored interventions. This study aims to assess perceived stress levels among HCWs in India during the COVID-19 pandemic and to identify coping strategies that could mitigate their stress.

2. Material and Methods:

Study design:

A cross-sectional online survey was conducted between August 11 and November 24, 2020, to assess perceived stress levels and coping strategies among healthcare workers (HCWs) in India during the COVID-19 pandemic. The survey link was disseminated via email, social media platforms (WhatsApp, Facebook, Telegram, and Twitter), and through healthcare organizations and associations, ensuring wide coverage.

Ethical Considerations

The study was approved by the Institutional Ethics Committee (Ref. No.: SMC/UECM/2020/136/102). Informed consent was obtained from all participants before survey completion. Participation was voluntary, and responses were anonymized to maintain confidentiality.

Subjects:

Participants included HCWs directly or indirectly involved in COVID-19 patient care.

Inclusion criteria were:

1. HCWs working in frontline (direct care) or second-line (indirect care) roles.
2. Indian HCWs working in COVID-19 care facilities during the study period.

Exclusion criteria included:

1. Non-healthcare workers.
2. HCWs not involved in COVID-19 care.
3. Incomplete or redundant survey responses.

A total of 261 responses were received, of which 169 were finalized after applying the inclusion and exclusion criteria.

Outcome measures:

A structured survey question was created in the Google form with a brief explanation about the study and its aim at the beginning of the survey and was available online for self-administration from 11 August 2020 to 24 November 2020. Various association and government website (such as https://covidwarriors.gov.in/) were used to spread the survey link. Other than this, the survey link was circulated via e-mail, WhatsApp, telegram and through social media such as Facebook and Twitter to all the health care workers and different medical association. A request to the recipients made for disseminate the survey link further among their networks and different contact groups. Variables such as demographic details, perceived stress and the strategies to reduce stress were assessed in the survey.

1. Socio-demographic:- Details such as age, gender, marital status, city and state of working, resident status (Living alone/ living with family), educational qualification, occupation (Allopathy Doctor, AYUSH Doctor, Dentist, Nurse, Medical student/ Interns and other) and year of work experience (less than 5 years, 5-10 years, more than 10 years) were collected. In addition, the participants were asked whether they were directly (frontline) or indirectly (second-line) involved in diagnosing, treating or caring for confirmed or suspected COVID-19 patients.

2. Perceived stress questionnaire (PSS 10): was used to assess the perceived stress level as it was mainly developed to evaluate the degree of a stressful situation in one's life.**[9]** It consist of 10 item on the thought and feeling of the participants. **[10]** Responses was given on 5-point likert scale: Never, Almost Never, Sometimes, Fairly often, Very often. Item no. 1, 2, 3, 6, 9 and 10 are scored from 0 to 4 whereas items no. 4, 5, 7 and 8 are scored from 4 to 0(reverse scoring). The total score was calculated by summing all 10 item of the scale with score ranges of 0 to 40. **[11]** Higher the score of PSS-10 indicates higher perceived stress levels, although it is not considered as diagnostic instrument as there is no predetermined cut-off for the score. **[12,13]** In this study, the cut-off was categorized into three equal tertile: less or equal to 13 as mild, between 14 to 26 as moderate and more than 27 as high perceived stress level.**[14-16]** The overall PSS 10 had good internal which was indicated by Cronbach Alpha of 0.63.

3. Coping strategies: In addition to demographic and PSS question regarding the strategies helped the health care workers to reduce their stress was asked with the following options: Yoga including pranayama, meditation and relaxation technique, exercise, gardening, reading, walking and others.

Data Analysis:

Data were analyzed using Microsoft Excel and R software. Descriptive statistics (frequencies, percentages, means, and standard deviations) summarized socio-demographic variables, PSS scores, and coping strategies. Associations between demographic characteristics and stress levels were analyzed using one-way analysis of variance (ANOVA). A p-value of <0.05 was considered statistically significant.

Table I. Descriptive statistics of socio-demographic variables.

Socio-demographic characteristics	N (%) (Total N =169)
Age N (%)	
≤39 years	149 (88.2%)
40-49	10 (5.92%)
≥50	10 (5.92%)
Gender N (%)	
Male	71 (42%)
Female	98 (58%)
Marital Status N (%)	
Married	71 (42%)
Unmarried	98 (58%)
Resident status N (%)	
Living alone	81 (47.9%)
Living with family	88 (52.1%)
Occupation N (%)	
Academic Doctor	4 (2.4%)
Administrative Doctor	1 (0.6%)
AYUSH Doctor	17(10.1%)
Doctor	44 (26%)
Medical Student / Interns	4 (2.4%)
Nurse	95 (56.2%)
Nursing officer	1 (0.6%)
PG Scholar	1 (0.6%)
Post – ANS	1 (0.6%)
Postgraduate – AYUSH	1 (0.6%)
Work experience in years N (%)	
less than 5 years	118 (69.8%)
between 5-10 years	23 (13.6%)
more than 10 years	28 (16.6%)
Working position N (%)	
Front-line	137 (81%)
Second-line	32 (18.9%)
States N (%)	
Andhra Pradesh	1 (0.6%)
Bihar	4 (2.4%)
Chhattisgarh	1 (0.6%)
Delhi	3 (1.8%)
Gujarat	1 (0.6%)
Haryana	1 (0.6%)
Himachal Pradesh	1 (0.6%)
Jammu and Kashmir	2 (1.2%)
Karnataka	16 (9.5%)
Kerala	2 (1.2%)
Maharashtra	3 (1.8%)
Nagaland	1 (0.6%)
Odisha	1 (0.6%)
Rajasthan	2 (1.2%)
Tamil Nadu	7 (4.1%)
Uttar Pradesh	120 (71%)
Uttarakhand	3 (1.8%)

3. Results

After the various effort made to circulate the survey link only 261 response was received. Out of 261 responses received, 3 participants (1.14%) did not give consent to participate and 65 participants (24.9%) response were excluded because participant were health care workers but was not involved in COVID-19 care, 1 participant's (0.38%) response was removed from the study as the participant was non-health care worker and other 23 participants' (8.81%) responses were redundant. Finally, a total of 169 participants' responses (64.7 %) were considered to be included for data analysis.

3.1 Socio-demographic characteristic of study participants:

Out of 169 participants, 98 (58%) were female and 71 (42%) were males, with a mean age of 29.98 ± 8.763. The participants of the sample were in different occupation such as Academic Doctor (2.4%), Administrative Doctor (0.6%), AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy) Doctor (10.1%), Doctor (26%), Medical Student/ Interns (2.4%), Nurse (56.2%), Nursing officer (0.6%), Post Assistant Nursing Superintendent (0.6%), and PG scholar in AYUSH (0.6%) and other PG scholar (0.6%). The working experiences of the participants ranged into less than five years, 5-10 years, and more than ten years and the number of participants falling in these ranges were 69.8%, 13.6%, and 16.6% respectively out of these participants working in front-line 137 (81%) and second-line 32 (18.9%) in different Facilities of COVID-19 in India. Among the 169 participants, 71 (42%) were married and 98 (58%) were unmarried and overall 81 (47.9%) participants were living alone and 88 participants (52.1%) were living with their family. (See Table. I)

3.2 Perceived Stress Scale Score:

The overall PSS score mean (SD) was 16.17 (5.8). Out of 169 participants 42 (24.85%), 121 (71.6%) and 6 (3.55%) reported that they had mild, moderate and severe perceived stress, respectively (Figure 1 & Table 2).

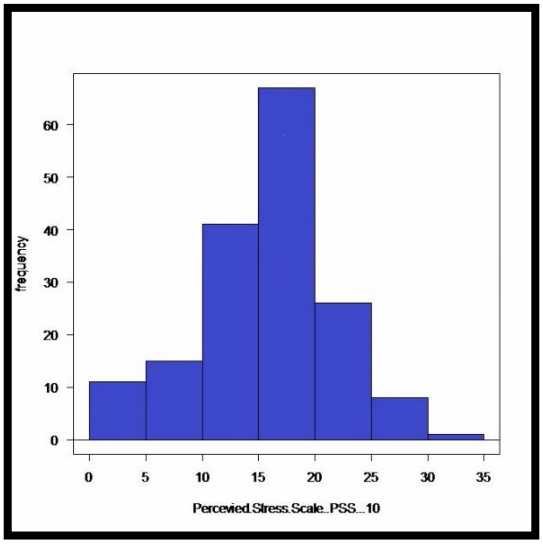

Figure 2:- Histogram of Perceived Stress Scale 10 (PSS-10) score in total study sample (n=169)

3.3 Coping Strategies:

Response regarding the coping strategies that helped to reduce their stress levels were as follows: Yoga including pranayama (63.9%), exercise (42.6%), meditation and relaxation (41.4%), reading(35.5%), walking (29%), gardening (18.3 %) and others (10.7%) (Figure 3 & Table 2).

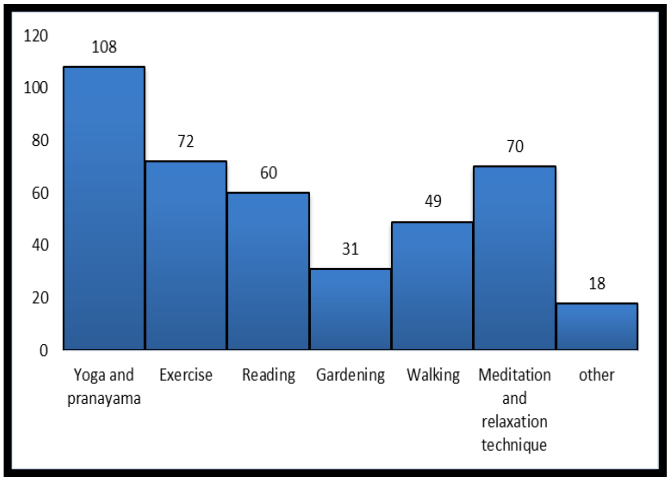

Figure:-3 Histogram of different Coping Strategies in total study sample (n=169)

When compared the coping strategies with mild moderate and severe percevied stress levels, yoga and pranayama was the most common choice of coping stratgies in Mild (69.05%) and moderate (61.98%) followed by Exercise and meditiation or relaxation technique in mild group with 47.62 %, whereas in sever pressevid group reading and meditation and relaxation technique with 83.33% followed by yoga & pranayama, exercise and walking with 66.67%. (See Table. II)

Table II. Answer to open-ended question about the most helpful coping strategies to educe Stress.

	Perceived stress Scale (PSS)-10 (mean (SD)				
	Low (≤13) n=42	**Moderate (14-26) n=121**	**High (≥27)n=6**	**Total(N=169)**	**P value**
Yoga and pranayama	29 (69.05)	75 (61.98)	4 (66.67)	108	0.71
Exercise	20 (47.62)	48 (39.67)	4 (66.67)	72	0.32
Reading	16 (38.10)	39 (32.23)	5 (83.33)	60	0.04
Gardening	6 (14.29)	23 (19.01)	2 (33.33)	31	0.5
Walking	14 (33.33)	31 (25.62)	4 (66.67)	49	0.75
Meditation and relaxation technique	20 (47.62)	45 (37.19)	5 (83.33)	70	0.05
Other	6 (14.29)	12 (9.96)	0 (0)	18	0.61

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Gardening	6 (14.29)	23 (19.01)	2 (33.33)	31	0.5
Walking	14 (33.33)	31 (25.62)	4 (66.67)	49	0.75
Meditation and relaxation technique	20 (47.62)	45 (37.19)	5 (83.33)	70	0.05
Other	6 (14.29)	12 (9.96)	0 (0)	18	0.61

4. Discussion

The present study showed that out of 169 COVID-19 health care workers there were about 121 HCWs and 6 HCWs under moderate and sever perceived stress levels, respectively. With 127 (75.15%) suffering from moderate-to-severe stress is very high when compared to a study by Du et al. (frontline HCWs, 59%). **[17]**

The overall PSS score mean (SD) was 16.17 (5.8) which was near to mean because of COVID-19 pandemic, globally [17.4 (6.4)].**[18]** A previous study conducted in India showed a total of 330 dermatologist and other physician suffered from moderate/severe stress levels which were mainly due overburdened with the workload and some time working without adequate protection causing fear of getting infected to increased fear of getting infected and becoming a mode of transmission to the family. **[19]**

This fear and stress may push the HCW to leave their work can be more stressful as they can face minimum support, appreciation and recognition, which can cause difficulty to get a new job and further financial stress can be seen. Not only it affects the HCWs, it will also affect the health care system of India with human resources and also increased workload to other HCWs because of minimal working hands.Previous studies had observed that there is a high level of psychological stress is seen in young people.**[20-22]** It can be related to the present study also as 149 participants were less than 39 years old. The reason for this high stress in young people is mainly because of the overload of information available on social media. **[23]**

It is also noticed that young people consider social media as the right source of information than compare to other official sources and take this as coping strategies for stress. In our study, an additional question asked for coping strategies it was observed in participant with sever perceived stress group has high choice (83.3%) the reading an option for reducing stress than compare to moderate (32.23%) and mild (38.1%) perceived stress group (p-value=0.04). this can be further examined as in the present study there was no data available from sources of information consider read by high preserved stress group.

They also observe additional stress because of social discriminating toward the HCWs to be potential sources of infection. This all factors collectively may cause impaired cognitive functioning, decreased capabilities for making the decision and a high chance of medical error which can affect during patient care chronic stress has been associated with chronic fatigue, psychiatric morbidity, substance abuse and even suicidal ideation as well. **[24-28]** As this study had a high number of females and unmarried doctors can have excess stress level, as proven by various studies that Female HCWs had reported high-stress levels.**[29]** This may be because of additional involvement in a family matter and other

household works than compare to males. And marriage HCWs may probably have an option to share the stress with partners or can feel relaxed with the family will act as a protective factor against stress.**[19]**

Majority (63.91%) of the HCWs reported that yoga including pranayama was their choice of option to coping stress followed by exercise (42.6%) and mediation & relaxation techniques (41.4%). This has confirmed the positive attitude to receive training in stress management. Hence it also further emphasizes the importance of adding the stress management programmes such as yoga, meditation, relaxation techniques, and exercise for all COVID-19 HCWs in India, to mitigate the stress levels.

4.1 Strength, limitation and further direction for research

The strength of this cross-sectional study was, it was first of its kind to interpret the perceived stress in Covid-19 health care workers in India. The duration to receive the responses for the survey was 3 months to have proper time for the survey to spread all health care worker in India. This study also had limitations due to unavoidable circumstances such as, it was conducted during COVID-19 pandemic when the health care was in the emergency state and were feeling overburdened because of uncontrolled increased cases coming for treatment in COVID-19 faculties in India, which may have affected the proper spread of the survey link leading to fewer responses and expected also potential selection bias based on the fact only those with smartphones/ computers could participate. Also, the survey link was limited hospitals, which were designated for treating COVID-19 and contact detail available on government COVID-19 portal. The additional question only asked the opinion of the health care worker for the best coping style but no data about them practising was available.

4.2 Future Research Directions

1. Longitudinal studies to assess changes in stress levels over time and evaluate the effectiveness of stress management interventions.
2. Comparative studies exploring stress levels in HCWs across different healthcare systems and cultural contexts.
3. Evaluating the impact of specific coping strategies, such as yoga-based programs, through randomized controlled trials.

5. Conclusion

The findings of this study reveal moderate-to-severe stress levels among Indian HCWs during the COVID-19 pandemic, with yoga and mindfulness-based strategies emerging as effective coping mechanisms. Addressing these stressors through institutional and policy-level interventions is essential to ensure the well-being and efficiency of HCWs during public health crises.

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