International Journal of Pharmaceutical Research and Applications
Volume 7, Issue 5 Sep-Oct 2022, pp: 1363-1369 www.ijprajournal.com ISSN: 2456-4494

Understanding the Stress Levels among Healthcare Workers Facing COVID-19 Pandemic: A Cross-Sectional Online-Based Study

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Submitted: 15-10-2022 Accepted: 31-10-2022

ABSTRACT
After the advent of the COVID-19 pandemic, healthcare professionals played a crucial role in treating patients against the most difficult challenges. The pandemic has resulted in the prevalence of a wide range of psychological problems, such as fear, anxiety, and stress, as healthcare professionals were constantly exposed to the risk of contracting the disease. Although the effects of other sources of stress on health have been documented, the effects of these unique conditions of the COVID-19 pandemic on the long-term health and well-being of the healthcare workforce are unknown. The present study assessed the mental and healthcare professionals facing COVID-19 working in various healthcare settings. A cross-sectional study was conducted online, where a Google form was prepared, including sociodemographic and occupational data, using validated questionnaires to assess perceived stress, anxiety, and depression, respectively. The form was distributed online to all social media groups among all healthcare workers, and responses were collected. The frequency of perceived stress was observed among the study participants according to the results of their questionnaires. Then the frequencies were compared between different sociodemographic characteristics. This study showed a high prevalence of perceived stress among healthcare workers during the COVID-19 pandemic that affected all workers regardless of sociodemographic characteristics.

Keywords: Healthcare workers, COVID-19, Stress, Depression, Hospitals

I. INTRODUCTION

Ever since the onset of the pandemic globally, SARS-CoV-2 has infected more than 224 million individuals [1]. Experience from the severe acute respiratory syndrome (SARS) outbreak in 2003 suggested that because of its heavy burden on the healthcare system, the rapidly rising number of COVID-19 cases would significantly impact the mental and physical health of the healthcare workforce. Such concerns indeed began to emerge early in the spring of 2020. It also seemed reasonable to expect that laboratory workers, office personnel, first responders, and others who were engaged less directly in caring for patients with COVID-19 compared to healthcare workers would experience similar strains on their psychological well-being. First responders, including police, fire, and emergency medical services, may experience higher exposure rates to SARS-CoV-2 than the general population [2, 3, 4, 5, 6, 7]. Healthcare systems in numerous countries have been overwhelmed by the COVID-19 pandemic, which has caused increased pressure on frontline health workers [8]. The overwhelming workload, increasing numbers of suspected and confirmed COVID-19 cases, lack of evidence-based treatments, shortages of personal protective equipment (P.P.E.), extensive media coverage, and perceptions of inadequate support may contribute to the mental burden of healthcare workers [10].

Concerns of healthcare workers that they might not only become infected with COVID-19 but also transmit it to family members and friends add to their psychological burden [9]. The combined result is that the COVID-19 pandemic can be expected to have a prolonged impact on the mental health of a broad range of workers who are essential for delivering health care.

Addressing mental health issues of health care professionals is essential to improving pandemic prevention and control. To date, research conducted on the psychological impact of COVID-19 on healthcare professionals is still under investigation. The current study aims to add more evidence-based data by evaluating mental health outcomes among healthcare professionals who interact with patients with COVID-19 by quantifying the magnitude of depression, anxiety, and distress symptoms and analyzing the potential risk factors associated with these symptoms.

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II. METHODOLOGY

Research Aim

- To assess perceived stress among healthcare professionals facing the COVID-19 pandemic in various hospitals/clinical settings.
- To assess general anxiety among healthcare professionals facing the COVID-19 pandemic in various hospitals/clinical settings.
- To assess depression among healthcare professionals facing the COVID-19 pandemic in various hospitals/clinical setups.
- To determine the sociodemographic and occupational risk factors for stress, anxiety, and depression among healthcare professionals facing the COVID-19 pandemic in various hospitals/clinical settings.

Study design: A web-based cross-sectional survey was designed to assess perceived stress, general, among healthcare professionals facing the COVID-19 pandemic.

Study setting: Participants in this survey included all healthcare professionals, namely (doctors) in various hospitals/clinical sets up, involved in treating patients during the COVID-19 pandemic throughout the globe.

Study population: 59 healthcare professionals (doctors) involved in treating COVID-19 patients and were at high risk of getting exposed to COVID-19 during treatment at their workplace.

Sampling technique: The link to the form was distributed to all social media and email groups, including healthcare professionals starting from July 25, 2022. Convenience Sampling was carried out.

Statistical analysis: All data were entered in Microsoft excel. Quantitative data, such as age, were presented as mean and S.D., while qualitative data, such as the frequency of perceived stress or depression, were presented as frequency and percentage. The difference between the frequency of mental health disorders among different socio demographic categories was assessed by the parametric tests using t-test and ANOVA.

Ethical considerations: As this was a questionnaire-based study, it did not require approval from any ethical committee. However, Informed consent was written at the beginning of the Google form, and participants chose if they agreed or disagreed with filling out the form.

III. RESULTS

Stress levels were assessed among the participants using Perceived Stress Scale. A total of 64 responses were received. The age distribution based on the response belonged to an age greater than 50 years. While 53.1 % of the respondents were female and 46.9 % were males. The maximum number of respondents was from India. Based on the results, most of the respondents were doctors, and they belonged to private hospitals. The result showed that the maximum number of respondents were post-graduate doctors.

The results showed that nearly 37.5 % perceived stress, while 28.1 % could not control essential things. The survey also showed that 39.1 % felt nervous during the pandemic. Concerning depression, about 6% of participants showed no or minimal degree of depression, and about 14% showed severe depression, while the remaining 80% showed varying grades, from mild to moderately severe.

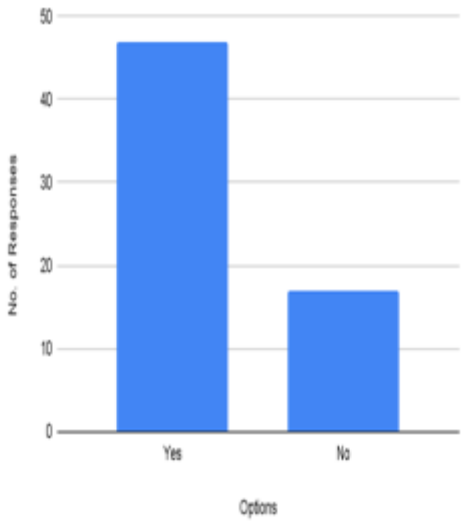

Figure 1: Graphical Representation of the Responses for the questions "Were you able to maintain a balance between your professional and personal life during the pandemic?" (N=59).

In figure 1, it can be seen that most of the respondents could maintain a work-life balance during the pandemic.

After knowing this, it was essential to understand the mechanism for the respondents to cope with the workload. In figure 2, most respondents reported dissociation from the workplace during working hours; watching television, and indoor activities

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were the primary reasons for them to cope with the workload.

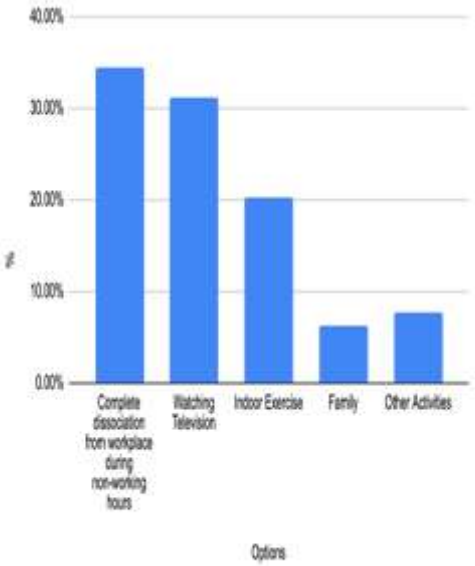

Figure 2: Graphical Representation of Responses for the questions "What measures did you take to cope with the workload during the pandemic?" (N=59).

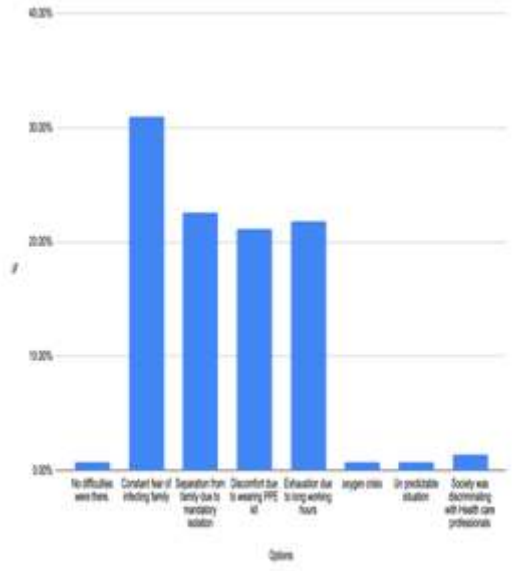

Figure 3: Graphical Representation of the Responses to the questions "What were some difficulties you faced during the pandemic?" (N= 59).

Figure 3 depicts the significant difficulties faced by the respondents' fear of infecting family members, separation from family due to mandatory quarantine, discomfort due to wearing P.P.E., and exhausting long hours.

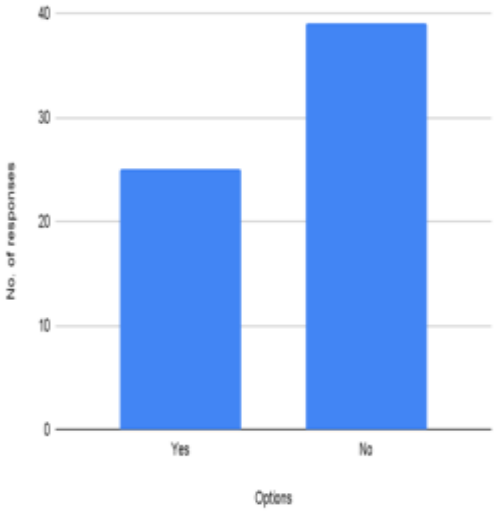

Figure 4: Graphical Representation of Responses for the questions "Is our healthcare setup prepared for future emergencies?" (N=59).

When asked about preparing our healthcare system for future emergencies, most respondents reacted with a "No," as shown in figure 4, which indicates the need to strengthen our healthcare system.

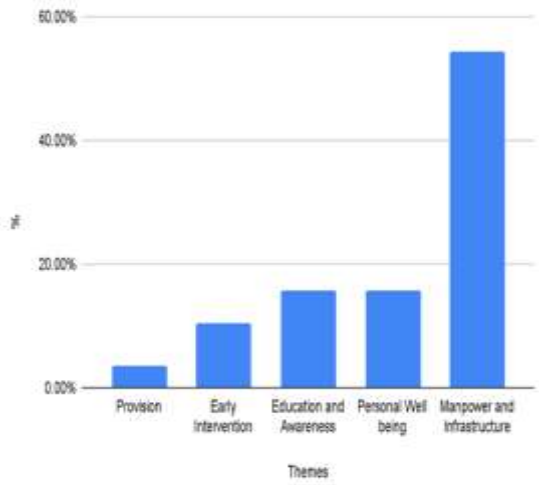

Figure 5: Graphical Representation of Responses for the questions "Suggest some learnings/best practices for our healthcare infrastructure to be better prepared for future health crises" (N=59).

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Impact of Gender on Stress Scores

The impact of gender on average stress scores was high for both genders but not significantly different.

Table 1: Descriptive statistics of stress scores of male and female doctors (N = 59)

	N	Mean	Std. Deviation	Std. Error Mean
Male	28	19.68	9.16	1.73
Female	31	19.65	5.96	1.07

A t-test was performed on the average stress scores; the p value was much higher than the cut-off value of 0.05 signifying that the difference in average scores for both the genders are not statistically significant. Table 2 shows the two tail p values of equal and unequal variances.

Table 2: t-test for Independent samples between stress scores of male and female doctors (N = 59)

	t	df	p (2-tailed)
Equal variances	0.02	57	.987
Unequal variances	0.02	45.62	.987

Note: p>0.05

Impact of Place of Practice on Stress Scores

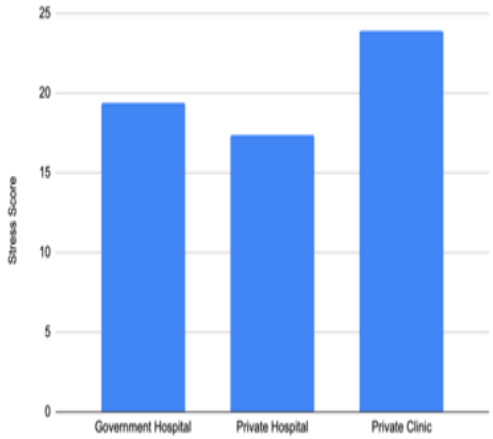

Figure 6: Stress scores of doctors practicing in government hospitals, private hospitals, and private clinics.

Figure 6 shows the average stress scores of doctors practicing in government hospitals, private hospitals, and private clinics. It can be seen that the average stress scores for doctors practicing in private clinics are relatively higher than government and private hospitals.

To confirm the statistical validity of the results, an ANOVA test was done on the average stress scores of the three practice settings. As shown in table 3, the p-value is .034 ($p<0.05$); hence the difference in average stress scores is statistically significant.

Table 3: ANOVA without repeated measures between average stress scores of doctors practicing in Government hospitals, private hospitals, and private clinics (N=58)

	Sum of Squares	df	Mean Squares	F	p	Critical F-Value
Between Groups	377.51	2	188.75	3.58	.034	3.16
Within Groups	2,953.71	56	52.74			

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Total	3,331.22	58

Note $p<0.05$

IV. DISCUSSION

The COVID-19 global pandemic had a worldwide effect on those directly exposed to the disease and on people's mental states, causing fear, anxiety, stress, and depression. This can be explained by the fact that the disease was new, the pathophysiology was poorly understood, and uncertainty of the prognosis with an apparent lack of knowledge about treatment modalities to be used. There was a sudden change in the daily work, socialization, lockdown restrictions, and containment zones, which stopped our systematic way of functioning. Since the disease is highly contagious, healthcare workers are the most vulnerable as they are the frontline warriors with a higher risk of getting the infection.

In this study which received around 65 responses, we calculated and compared the stress level of respondents based on their age, gender, and occupational setting. The Mean Perceived Stress Score for the respondents in the age range 45-50 was 17.15, while for those 50+ was 19.125. A t-test on the data set for these two age ranges showcases no statistical difference. This means there is no correlation between age and a statistically significant increase in Stress Scores. Scores compared based on the gender of the respondents also showed no statistically significant change. The mean Perceived Stress Score for men questioned in the survey was 19.67, while that for the women was 19.64. This again shows no correlation between gender and an increase in stress. Finally, the occupational setting did demonstrate a statistical difference across respondents. Respondents chose their occupational setting between a government hospital, a private hospital, and a private clinic. An ANOVA test on the calculated values returned a p-value of 0.00344, less than 0.005. This means that occupational setting was a factor that affected the stress levels of healthcare workers. Private Hospitals scored the lowest with a score of 19.5, while Private Clinics scored the highest with a score of 24. It should also be noted that the questionnaire used to mark 24 as the most stressed score.

The data collected in this research is consistent with most studies conducted worldwide. Research published in October 2021 discussed the results of the COVISTRESS survey, which surveyed healthcare professionals from all over the globe. The results showed that 'Healthcare professionals demonstrated an increased risk of very-high stress levels (>80) compared to other workers (OR = 2.13, 95% CI 1.87–2.41)'[11]. Another research conducted on nurses in Wuhan reported high stress, anxiety, and depression rates [12]. Although the prevalence of stress is much higher in the research conducted in Wuhan, this can be attributed to the fact that our research is being conducted two years after the pandemic began, during which the healthcare community has adjusted and adapted to the conditions. In contrast, the Wuhan research was conducted only a few months after the virus's onset. Besides these, several other studies have investigated the stress levels of healthcare professionals actively operating during the pandemic [13][14][15].

This questionnaire also asked the respondents to suggest certain 'best practices that the healthcare setup can adopt. Responses were divided into five themes: Provisions, Early Intervention, Education and Awareness, Manpower and Infrastructure, and Personal Well-Being. 3.51% of respondents suggested provisions for the workers, 10.53% suggested Early Intervention, an equal percentage of respondents, 15.8%, suggested Education and Awareness and Personal Well Being, while the maximum number of respondents, 54.38%, suggested an increase in Manpower and Infrastructure.

V. CONCLUSION

This study aimed to investigate the stress levels of healthcare workers operating during the COVID-19 pandemic. The primary aim of this research was to investigate how the pandemic affected the stress levels of frontline healthcare workers. Keeping this in mind, this research was conducted on primary data collected from the healthcare community. In our questionnaire, we were also able to ask questions which asked them to suggest immediate solutions and improvements to our current healthcare infrastructure.

An online questionnaire with ten questions from a Perceived Stress Scale and three subjective questions was created and circulated among healthcare workers. The stress scores of respondents were calculated and then divided based on respondent age, gender, and occupational setting. Results showcased that although the stress scores for both males and females were high, they

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were not statistically different, with an average value close to 19.6. The occupational setting did showcase a statistical difference in its values. Private Clinics scored the highest with a score of 24, while Government Hospitals and Private Hospitals scored 19.4 and 17.4, respectively.

It is important to note one limitation of this research, which is that the study was performed via an online form. This was missed by some healthcare member participants, who may have been offline during this period or may not have been interested in using social media.

VI. RECOMMENDATIONS

Some recommendations that can be put into practice to ensure the well-being of healthcare workers include targeted interventions that help enhance the mental health of the healthcare community. Along with this, adequate support in the form of appropriate education and training. Most respondents also recommended support in the form of an increased workforce and an improvement in the healthcare infrastructure. Mental health support can also be provided for those working long hours through telemedicine.

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