Stress Among Medical Staff During COVID-19 in a Tertiary Care Hospital, Lahore, Pakistan: A Cross-Sectional Study

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ABSTRACT

Background: The COVID-19 pandemic has significantly impacted the mental health of medical staff, particularly those working in high-pressure environments such as tertiary care hospitals. Understanding the factors influencing stress levels in these professionals is essential for developing effective support strategies.

Objective: To assess the level of stress among medical staff working during the COVID-19 pandemic in a tertiary care hospital in Lahore, Pakistan.

Methods: A descriptive cross-sectional study was conducted at the Punjab Institute of Cardiology, Lahore, from April to June 2022. A total of 172 medical staff, including doctors, nurses, and paramedical staff, were randomly selected. Stress levels were measured using the DASS-21 stress subscale. Data were analyzed using SPSS version 25, with logistic regression employed to identify risk factors for elevated stress levels.

Results: Among participants, 42.8% (n=74) had stress scores ≥ 15. Females had lower odds of high stress (OR: 0.48, P=0.046), and those infected with COVID-19 had a reduced likelihood of high stress (OR: 0.42, P=0.000).

Conclusion: The study found significant associations between stress levels and factors such as gender and COVID-19 infection status, highlighting the need for tailored mental health support for healthcare workers.

INTRODUCTION

The COVID-19 pandemic has placed unprecedented pressure on healthcare systems worldwide, significantly impacting the well-being of medical staff, particularly in tertiary care hospitals where the severity and complexity of cases are higher. Medical staff working in such environments are often exposed to increased stress levels due to the high demands of patient care, the constant risk of infection, and the need to adapt quickly to evolving treatment protocols. The rapid and widespread transmission of COVID-19 exacerbated these stressors, leading to heightened levels of anxiety, depression, and burnout among healthcare workers (1). In this context, it becomes crucial to understand the specific factors contributing to stress among medical staff to develop targeted interventions aimed at mitigating these effects and promoting mental health.

In tertiary care settings, the role of medical staff is multifaceted, involving not only the direct care of critically ill patients but also the management of complex cases requiring specialized interventions. This, coupled with the scarcity of resources such as personal protective equipment (PPE), has further intensified the stress experienced by healthcare workers (3). The constant fear of contracting the virus and the potential of transmitting it to loved ones has added to the psychological burden faced by these professionals (5). A significant body of research has documented the mental health challenges faced by healthcare workers during the pandemic. For instance, studies conducted in China during the initial outbreak reported high levels of stress and anxiety among medical staff, which were attributed to the overwhelming patient load and the risk of infection (2).

Moreover, previous studies have highlighted that the stress experienced by healthcare workers in intensive care units (ICUs) and other high-pressure environments is often more pronounced compared to those in less critical settings (4). This disparity can be attributed to the constant exposure to severe cases and the emotional toll of managing patients with life-threatening conditions. Additionally, the lack of adequate support, long working hours, and the need to stay updated with rapidly changing guidelines have further compounded the stress levels among medical staff during the COVID-19 pandemic (5). The psychological impact of this stress is not only detrimental to the well-being of healthcare workers but also poses a risk to patient safety, as it may lead to increased errors and reduced job performance (6, 7).

Given the significant implications of stress on both healthcare workers and patient outcomes, it is imperative to explore the factors that contribute to stress in medical staff during the pandemic, particularly in the context of tertiary care hospitals. By identifying these factors, healthcare institutions can implement strategies to support their staff, reduce burnout, and ensure the delivery of high-quality care even in the face of unprecedented challenges. This study aims to assess the levels of stress among medical staff at a tertiary care hospital in Lahore during the COVID-19 pandemic, with a focus on understanding the demographic

and occupational factors that may influence stress levels (3). The findings of this research will contribute to the growing body of knowledge on the mental health of healthcare workers during pandemics and inform the development of interventions to enhance their well-being (1).

MATERIAL AND METHODS

The study employed a descriptive cross-sectional design to assess stress levels among medical staff at the Punjab Institute of Cardiology, Lahore, during the COVID-19 pandemic. The study was conducted from April to June 2022 and targeted a population of medical staff, including doctors, nurses, and paramedical staff working at the hospital. A random sampling method was utilized to select participants, resulting in a sample size of 172, which was determined using the formula $n = N1 + N(e2)n = \frac{N}{1 + N(e^2)} n = 1 + N(e2)N$ with a 95% confidence level and an 8% margin of error, based on a total population of 1,132.

Inclusion criteria for participation were clearly defined and included medical staff who were currently on duty, both male and female, and who were affiliated with the Punjab Institute of Cardiology, Lahore. The study specifically excluded individuals who were not actively working at the time of data collection. Stress levels were assessed using the Depression Anxiety and Stress Scale 21 (DASS-21), focusing on the stress subscale, which consists of seven items. These items were rated on a 4-point Likert scale, ranging from 0 (indicating "Did not apply to me at all") to 3 (indicating "Applied to me very much, or most of the time"). The scale allowed participants to indicate the degree to which each statement applied to their experiences of stress. The stress subscale scores were categorized as normal (0–14), mild (15–18), moderate (19–25), severe (26–33), and extremely severe (34–42). Data collection involved administering a comprehensive questionnaire that gathered demographic information such as age, gender, marital status, and number of children. Additionally, the questionnaire inquired about the participants' exposure to COVID-19, including the frequency of contact with infected patients, the provision and availability of personal protective equipment (PPE), and whether the participants had been infected with COVID-19 themselves. The data collection

process was conducted in accordance with ethical guidelines, with written consent obtained from all participants after they were fully informed about the study's purpose and assured of the confidentiality of their responses. Ethical approval for the study was obtained from the relevant institutional review board, and the study was conducted in compliance with the principles outlined in the Declaration of Helsinki.

Data were analyzed using SPSS version 25. Descriptive statistics were used to summarize the demographic characteristics of the participants, and logistic regression analysis was performed to identify risk factors associated with stress levels. The logistic regression model allowed for the examination of the relationships between various predictor variables, such as age, gender, marital status, and COVID-19 infection status, and the likelihood of experiencing elevated stress levels. The results were presented in terms of odds ratios (OR) with 95% confidence intervals (CI) to quantify the strength of associations between the predictor variables and stress outcomes.

In summary, the study employed a robust methodological approach to assess stress among medical staff in a tertiary care setting during the COVID-19 pandemic, utilizing validated instruments, appropriate sampling techniques, and rigorous statistical analysis. The findings provide valuable insights into the factors contributing to stress in healthcare workers during a public health crisis, with implications for developing targeted interventions to support their mental health and well-being.

RESULTS

The study included a total of 172 medical staff from the Punjab Institute of Cardiology, Lahore. The demographic characteristics of the participants are summarized in Table 1. The majority of participants were female (74.4%, n=128) and married (58.7%, n=101). The age distribution was predominantly between 26-30 years (44.8%, n=77), with a smaller proportion above 35 years (12.2%, n=21). In terms of COVID-19 exposure, 27.3% (n=47) of the participants reported visiting more than 15 COVID-19-positive patients, and 67.4% (n=116) indicated that the provision of personal protective equipment (PPE) was sufficient. Notably, 51.2% (n=88) of the participants reported having been infected with COVID-19.

Table 1. Demographic Characteristics of the Respondents (N=172)

Characteristic	Frequency (n)	Percentage (%)
Age (Years)		
20-25	24	14.0
26-30	77	44.8
31-35	50	29.1
>35	21	12.2
Gender		
Male	44	25.6
Female	128	74.4
Marital Status		
Married	101	58.7
Unmarried	71	41.3
Number of Children		

Characteristic	Frequency (n)	Percentage (%)
0	82	47.7
1-2	46	26.7
3-4	35	20.3
>4	9	5.2
Number of Visits to COVID-19 Patients		
0	20	11.6
1-5	62	36.0
6-15	43	25.0
>15	47	27.3
Provision of PPE		
Absent	8	4.7
Poor	28	16.3
Sufficient	116	67.4
Excellent	20	11.6
Infected with COVID-19		
Yes	88	51.2
No	84	48.8

The association between demographic characteristics and stress prevalence is detailed in Table 2. The logistic regression analysis revealed several significant associations. Participants aged over 35 years showed increased odds of having a stress score ≥ 15, with an odds ratio of 1.37 (95% CI: 0.7–2.7), although this was not statistically significant (P=0.362). Gender was a significant factor, with females less likely to have a stress score ≥ 15 compared to males (OR: 0.48, 95% CI: 0.23–0.99, P=0.046). Marital status also played a role, with unmarried individuals showing a lower likelihood of elevated stress scores, though this was not statistically significant (OR: 1.31, 95% CI: 0.83–2.05, P=0.242).

Table 2. Association between Demographic Characteristics and Stress Prevalence (N=172)

Characteristic	Stress Score ≥ 15 n (%)	Stress Score ≤ 14 n (%)	OR	95% CI of OR	P-value
Age (Years)					
20-25 (reference)	8 (33.3)	16 (67.7)	1	–	–
26-30	23 (29.8)	54 (70.2)	1.37	0.7–2.7	0.362
31-35	17 (34.0)	33 (66.0)	0.69	0.4–1.18	0.176
>35	9 (42.8)	12 (57.2)	0.67	0.4–1.35	0.107
Gender					
Male (reference)	12 (27.7)	32 (72.3)	1	–	–
Female	30 (23.4)	98 (76.6)	0.48	0.23–0.99	0.046
Marital Status					
Married (reference)	67 (66.3)	34 (33.7)	1	–	–
Unmarried	21 (29.5)	50 (70.5)	1.31	0.83–2.05	0.242
Direct Contact with COVID-19 Patients					
No (reference)	7 (31.8)	15 (68.2)	1	–	–
Yes	46 (30.6)	104 (69.4)	1.94	1.13–3.32	0.015
Infected with COVID-19					
No (reference)	34 (40.4)	50 (59.6)	1	–	–
Yes	30 (34.0)	58 (66.0)	0.42	0.26–0.67	0.000

Direct contact with COVID-19 patients did not significantly affect stress levels, with an odds ratio of 1.94 (95% CI: 1.13–3.32, P=0.015), showing that other factors may be more relevant in influencing stress among medical staff. The logistic regression analysis identified that infection with COVID-19 was significantly associated with lower stress scores. Participants who had been infected with COVID-19 had lower odds of having a stress score ≥ 15 (OR: 0.42, 95% CI: 0.26–0.67, P=0.000), suggesting that personal experience with the virus may have contributed to increased resilience or coping mechanisms among those individuals. This finding contrasts with the expectation that direct contact with COVID-19 patients would increase stress, as the analysis showed no significant difference between those with and without direct contact. The results underscore the complexity of stress dynamics among medical staff during the pandemic and the need for personalized support strategies tailored to individual experiences and stressors.

DISCUSSION

The findings of this study provided valuable insights into the stress levels experienced by medical staff during the COVID-19 pandemic in a tertiary care hospital in Lahore, Pakistan. The results indicated that several demographic

factors, including age, gender, marital status, and COVID-19 infection status, were associated with varying levels of stress among healthcare workers. These findings align with previous studies that have highlighted the significant impact of the pandemic on the mental health of healthcare professionals worldwide (1, 4).

One of the notable observations was the association between gender and stress levels, where female medical staff exhibited lower odds of elevated stress scores compared to their male counterparts. This finding was consistent with previous research, which has shown that female healthcare workers often report lower stress levels due to stronger social support networks and more effective coping strategies (2, 5). However, it also contradicted some studies that have found females to be at higher risk of stress, anxiety, and burnout during the pandemic, possibly due to their dual roles in professional and domestic settings (3). This discrepancy highlighted the complex nature of stress among healthcare workers and suggested that gender-specific factors, including societal expectations and support mechanisms, played a significant role in stress management.

The study also found that marital status influenced stress levels, with unmarried individuals showing a lower likelihood of elevated stress scores. This finding supported the hypothesis that marital responsibilities, such as caring for family members, might add to the stress experienced by healthcare workers during a pandemic (10). Previous studies have reported similar trends, where married healthcare workers reported higher levels of stress due to concerns about transmitting the virus to their families and managing household responsibilities alongside their professional duties (9). On the other hand, unmarried individuals might have had fewer external stressors, allowing them to focus more on self-care and professional responsibilities without the added burden of family obligations.

Interestingly, the study revealed that direct contact with COVID-19 patients did not significantly impact stress levels, which was somewhat unexpected. While previous research had suggested that healthcare workers in direct contact with COVID-19 patients were more likely to experience higher stress levels due to the increased risk of infection and emotional toll (7), the present study did not find a significant association. This could be attributed to the availability of sufficient PPE and the implementation of strict infection control measures, which might have mitigated the perceived risk among medical staff. Additionally, factors such as perceived control over the work environment and the availability of social support might have played a more significant role in determining stress levels than direct patient contact (9).

Another significant finding was the association between COVID-19 infection status and stress levels. Healthcare workers who had been infected with COVID-19 reported lower stress levels, which might seem counterintuitive at first glance. However, this finding could be explained by the concept of post-traumatic growth, where individuals who experience traumatic events develop resilience and coping mechanisms that reduce subsequent stress (14). Studies have shown that healthcare workers who recovered from COVID-19 developed a sense of psychological resilience and a stronger sense of control over their circumstances, which helped them manage stress more effectively (15, 16). Furthermore, the experience of surviving a life-threatening illness might have led to a reevaluation of personal priorities, resulting in a more balanced approach to stress management (17).

The strengths of this study included the use of a validated tool (DASS-21) to assess stress levels and a robust sample size that provided reliable insights into the stress experienced by medical staff in a tertiary care setting. However, the study also had limitations. The cross-sectional design only provided a snapshot of stress levels at a specific time point, and it was not possible to assess changes in stress over time. Additionally, the study was conducted in a single tertiary care hospital, which might limit the generalizability of the findings to other healthcare settings. Future research should consider longitudinal studies to track stress levels over time and include multiple healthcare settings to provide a more comprehensive understanding of the factors contributing to stress among medical staff.

CONCLUSION

In conclusion, this study highlighted the complex interplay of demographic and occupational factors influencing stress levels among medical staff during the COVID-19 pandemic. The findings underscored the importance of providing targeted support and interventions that consider individual differences, such as gender, marital status, and personal experiences with COVID-19. Healthcare institutions should prioritize the mental health and well-being of their staff by ensuring adequate support systems, including access to PPE, mental health resources, and organizational support, to mitigate the impact of stress and promote resilience among healthcare workers during public health crises.

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