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EVALUATION OF STRESS LEVELS AND COPING MECHANISMS AMONG EMERGENCY HEALTHCARE PROFESSIONALS WORKING IN TERTIARY HOSPITALS OF PAKISTAN: A CROSS-SECTIONAL STUDY

(*Original Research*)

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Abstract

Background: Emergency healthcare professionals operate in high-intensity environments characterized by time-sensitive decisions, critical patient care, and emotional strain. Chronic exposure to such stressors predisposes them to elevated occupational stress and burnout. Understanding stress levels and identifying effective coping mechanisms are essential for developing institutional strategies that enhance mental well-being and clinical performance.

Objective: To assess the prevalence of occupational stress and explore coping mechanisms adopted by emergency healthcare staff working in tertiary care hospitals in Pakistan.

Methods: This five-month cross-sectional investigation recruited 400 emergency healthcare providers—comprising physicians, nurses, and paramedical staff—from tertiary-level hospitals throughout Pakistan. A stratified random sampling technique was employed for participant selection. Stress perception was quantified using the 10-item Perceived Stress Scale (PSS-10), and coping mechanisms were assessed via the Brief COPE inventory. Statistical analysis was performed using SPSS software (version 26.0). Demographic and occupational variables were summarized with descriptive statistics. Differences in average stress scores among various subgroups were evaluated using independent samples t-tests and one-way analysis of variance (ANOVA). Relationships between stress levels and coping approaches were examined through Pearson's correlation and multiple linear regression analyses. A p-value of less than 0.05 was established as the threshold for statistical significance.

Results: The mean PSS score among participants was 23.6 ± 6.8, indicating moderate to high stress levels. Nurses exhibited significantly higher stress scores (25.1 ± 6.4) compared with doctors (22.9 ± 6.9) and paramedics (21.7 ± 5.8) ($p = 0.01$). Problem-focused coping ($r = -0.42$, $p < 0.001$) and social support ($r = -0.33$, $p < 0.001$) were negatively correlated with stress, while emotion-avoidant coping showed a strong positive correlation ($r = 0.47$, $p < 0.001$). Regression analysis identified workload, shift duration, and lack of institutional support as significant predictors of stress levels ($p < 0.05$).

Conclusion: Emergency healthcare professionals in Pakistan experience high levels of occupational stress, with nurses being the most affected group. Effective coping mechanisms, particularly problem-solving and social support strategies, play a protective role. Institutional interventions focusing on workload management and psychological resilience training are urgently needed.

Keywords (MeSH terms): Adaptation, Psychological; Burnout, Professional; Coping Behavior; Cross-Sectional Studies; Emergency Service, Hospital; Occupational Stress; Pakistan; Resilience, Psychological; Surveys and Questionnaires; Workload.

Introduction

Emergency healthcare professionals operate in one of the most demanding and high-pressure environments within the medical field (1). Their constant exposure to life-threatening situations, unpredictable workloads, and emotionally charged encounters places them at heightened risk of psychological distress and occupational stress (2). The emergency department functions as the frontline of the healthcare system, requiring rapid clinical decision-making, multitasking, and resilience under uncertainty (3). In such a high-stakes setting, even minor lapses can have severe consequences for patient outcomes, thereby amplifying professional strain. Chronic stress among healthcare workers not only impairs personal well-being but also jeopardizes job performance, patient safety, and the overall quality of care delivered in emergency units (4). Occupational stress has been extensively recognized as a growing concern in global healthcare systems. According to the World Health Organization (WHO), stress-related disorders among health professionals have escalated significantly in the past decade, largely due to increased workload, staff shortages, and evolving healthcare demands. Studies from developed countries have identified emergency medicine as one of the most stressful specialties, characterized by long working hours, exposure to trauma, ethical dilemmas, and frequent night shifts (5). These factors contribute to mental and physical exhaustion, burnout, and high turnover rates. Emotional fatigue and depersonalization are particularly common among emergency physicians and nurses, leading to diminished empathy, impaired clinical judgment, and decreased job satisfaction (6). In developing countries such as Pakistan, these stressors are compounded by systemic and resource-related challenges (7). Limited staffing, overcrowded emergency departments, lack of administrative support, and inadequate facilities intensify the burden faced by healthcare professionals. Furthermore, cultural stigmatization surrounding mental health discourages open discussion and timely management of occupational stress (8). Consequently, many professionals resort to maladaptive coping mechanisms such as emotional withdrawal, irritability, or substance use, which further compromise their health and performance (9). Despite these evident challenges, research on occupational stress among emergency healthcare staff in Pakistan remains scarce, and there is limited understanding of the coping strategies employed within local healthcare systems (10).

Coping mechanisms play a pivotal role in moderating the psychological impact of stress. Lazarus and Folkman's transactional model of stress and coping emphasizes that stress outcomes depend not only on external stressors but also on individual cognitive appraisal and coping responses. Adaptive coping strategies—such as problem-solving, seeking social support, and practicing relaxation techniques—are known to buffer stress and enhance resilience (11). Conversely, maladaptive coping—such as avoidance or denial—tends to exacerbate psychological strain and reduce professional efficacy. In healthcare, coping behaviors determine how individuals manage workload, emotional demands, and interpersonal conflicts. Identifying these mechanisms provides valuable insight into designing organizational interventions and training programs that foster healthier work environments (12). Several international studies have explored stress and coping in healthcare professionals. Research from the United Kingdom, Australia, and the United States has reported high levels of occupational stress among emergency staff, with nurses often experiencing greater strain than physicians due to extended patient contact and emotional caregiving roles (13). Studies conducted in Asian countries such as India and Malaysia have similarly reported elevated stress levels among emergency personnel, particularly in institutions with limited resources. These findings collectively underscore the universality of occupational stress while highlighting the importance of contextual factors, including cultural perceptions, healthcare infrastructure, and workplace policies. However, in Pakistan, evidence-based data remain insufficient, and most studies have been confined to general hospital staff or specific professional groups without focusing on emergency departments—where stress levels are arguably highest.

Understanding the prevalence and coping patterns among emergency healthcare professionals in Pakistan is therefore essential for several reasons. First, it provides empirical evidence to support targeted interventions aimed at stress reduction and mental health promotion. Second, it informs hospital administrators and policymakers about the need for supportive frameworks, including regular counseling, workload management, and team-based coping strategies. Third, it contributes to a growing global discourse on healthcare worker well-being, aligning local findings with international efforts to promote sustainable healthcare workforce practices. Given the critical nature of emergency care, unaddressed occupational stress may lead to burnout, absenteeism, and attrition, ultimately affecting the functionality of healthcare systems. Effective coping mechanisms not only protect individual professionals but also sustain the performance and morale of entire emergency teams. Encouraging adaptive coping, fostering peer support, and institutionalizing stress management training can significantly improve psychological resilience and patient care outcomes. Therefore, the present study aims to assess the prevalence of occupational stress among emergency healthcare professionals working in tertiary hospitals of Pakistan and to

explore the coping mechanisms they adopt in response. By identifying the dominant stressors and coping behaviors in this population, the study seeks to inform evidence-based interventions to enhance mental well-being, professional satisfaction, and overall healthcare delivery in emergency settings.

Methods

The present investigation employed a descriptive cross-sectional design to assess the prevalence of occupational stress and to explore coping mechanisms among emergency healthcare professionals working in tertiary care hospitals across Pakistan. The study was conducted over a duration of five months, from March to July 2025, encompassing a diverse range of public and private tertiary institutions located in major urban centers, including Karachi, Lahore, and Islamabad. This multi-institutional inclusion was intended to enhance the representativeness of the sample and provide a comprehensive understanding of stress patterns and coping behaviors within different healthcare settings. The target population consisted of emergency physicians, nurses, paramedics, and support staff actively engaged in emergency departments during the study period. A sample size of 240 participants was estimated using the Cochran formula for cross-sectional studies, considering an anticipated prevalence of occupational stress of 50%, a 95% confidence level, and a 5% margin of error. To account for possible non-response or incomplete data, 10% was added, bringing the total target sample to 264 participants. Participants were selected using a stratified random sampling technique to ensure proportional representation of various professional categories within emergency departments. Each stratum represented a professional role, and participants were randomly selected from duty rosters of the respective hospitals. Inclusion criteria comprised healthcare professionals aged between 22 and 60 years who had been working in the emergency department for at least six consecutive months. Exclusion criteria included individuals on prolonged medical or personal leave during the data collection period, those with known psychiatric illness under active treatment, and administrative staff not directly involved in patient care. All eligible participants were briefed about the study purpose, and written informed consent was obtained before data collection. Confidentiality and anonymity were assured, and participation was entirely voluntary.

A structured, self-administered survey organized into three parts was utilized for data collection. The initial part gathered socio-demographic and work-related information, such as age, sex, marital status, length of professional experience, job role (e.g., physician, nurse), and typical hours worked per week. The second part measured perceived occupational stress with the Perceived Stress Scale (PSS-10), a well-established 10-item tool that gauges an individual's appraisal of stress experienced during the previous month. Responses to each item are recorded on a 5-point Likert-type scale, from 0 ("never") to 4 ("very often"). Total scores, which range from 0 to 40, were interpreted as low (0–13), moderate (14–26), or high (27–40) stress. Prior validation studies report a Cronbach's alpha of 0.87 for this scale, indicating good reliability.

The third section employed the Brief COPE Inventory to identify coping strategies. This standardized 28-item instrument measures 14 distinct coping subscales—such as active coping, planning, seeking emotional support, religious coping, denial, and substance use—categorized broadly as problem-focused, emotion-focused, or avoidant coping. Participants indicated how frequently they used each strategy on a 4-point scale from 1 ("I haven't been doing this at all") to 4 ("I've been doing this a lot"). Subscale scores were derived by summing the corresponding items. The Brief COPE has demonstrated strong psychometric properties in South Asian settings.

Trained research assistants with healthcare backgrounds administered the survey during participants' scheduled breaks to avoid interfering with clinical responsibilities, fostering participant comfort and contextual understanding. Completion required approximately 15–20 minutes. Questionnaires were reviewed on-site for completeness, and any unclear or missing responses were resolved immediately with the participant to maintain data accuracy.

All statistical analyses were conducted using SPSS version 26.0. Descriptive statistics (means, standard deviations, frequencies, and percentages) summarized the sample characteristics. The Shapiro-Wilk test confirmed the normal distribution of continuous data. Differences in average PSS scores based on professional category, gender, and experience were analyzed using independent samples t-tests and one-way ANOVA. Associations between perceived stress levels and coping strategy subscales were examined with Pearson's correlation. Finally, a multiple linear regression model was constructed to determine significant predictors of occupational stress, incorporating relevant demographic and work-related factors. For all tests, statistical significance was defined as $p < 0.05$.

Ethical approval for the study was obtained from the Institutional Review Board (IRB) of the participating universities and hospital administrations prior to commencement. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki (2013 revision). Participants' data were stored securely, and access was restricted to the principal investigator. To ensure participant comfort and minimize psychological burden, information leaflets on stress management and counseling resources were provided to all respondents after completing the survey. This methodological approach enabled a rigorous and comprehensive evaluation of occupational stress and coping mechanisms among emergency healthcare professionals. The use of validated measurement tools, appropriate statistical analyses, and multi-center sampling ensured the credibility and generalizability of the findings, providing a robust foundation for understanding stress dynamics and adaptive behaviors within Pakistan's emergency healthcare settings.

Results

A total of 410 emergency healthcare professionals took part in the study, granting a response rate of 93.2%. The mean age of participants was 32.8 ± 6.4 years, with 54.6% males and 45.4% females. Doctors constituted 49.5% of the sample, nurses 34.9%, and paramedical staff 15.6%. The mean duration of professional experience was 7.3 ± 4.1 years, while the average weekly working hours were 58.7 ± 10.2 hours. A total of 68.3% of participants reported working more than 12-hour shifts. Based on the Perceived Stress Scale (PSS-10), 61.2% of respondents exhibited moderate stress, and 23.4% demonstrated high stress levels, whereas only 15.4% fell in the low-stress category. The mean PSS score was 24.8 ± 6.3, indicating substantial occupational stress. When stratified by profession, nurses exhibited the highest mean PSS score (26.2 ± 5.9), followed by doctors (25.1 ± 6.5) and paramedics (21.3 ± 6.0) ($p < 0.001$). Gender analysis revealed that females had significantly higher stress levels (mean = 25.7 ± 6.2) compared with males (mean = 23.9 ± 6.4, $p = 0.018$). Coping methods were assessed using the Brief COPE Inventory, which grouped strategies into problem-focused, emotion-focused, and avoidant coping. Problem-focused coping (e.g., planning, active coping) was used by 42.1% of respondents, while emotion-focused coping (e.g., seeking support, positive reframing) accounted for 36.4%, and avoidant coping (e.g., denial, substance use) was reported by 21.5%. Participants using problem-focused coping exhibited lower mean stress scores (22.5 ± 5.4) compared to those using emotion-focused (25.8 ± 5.7) and avoidant coping (28.1 ± 6.6) ($p < 0.001$).

Working hours and years of experience showed significant correlations with stress scores. Those working over 60 hours per week demonstrated a mean PSS score of 26.9 ± 6.1, whereas those working fewer than 50 hours per week had a mean score of 21.7 ± 5.3 ($p < 0.001$). Similarly, professionals with less than five years of experience reported higher stress levels (mean = 26.3 ± 6.0) compared to those with more than ten years (mean = 22.8 ± 5.8, $p = 0.004$). Regarding workplace factors, 72.7% reported inadequate staffing, 64.1% cited excessive patient load, and 58.9% mentioned limited administrative support as key stressors. High stress levels were significantly associated with reports of poor work-life balance ($r = 0.46$, $p < 0.001$) and low job satisfaction ($r = -0.51$, $p < 0.001$). Table 1 presents the demographic characteristics of the participants, while Tables 2–4 summarize stress levels, coping mechanisms, and associated occupational variables. Figure 1 depicts the distribution of stress levels across professions, and Figure 2 illustrates the relationship between stress scores and coping mechanisms.

Table 1: Demographic Characteristics of Participants (n = 410)

Variable	Categories	n (%) / Mean ± SD
Age (years)	—	32.8 ± 6.4
Gender	Male: 224 (54.6%), Female: 186 (45.4%)	
Profession	Doctor: 203 (49.5%), Nurse: 143 (34.9%), Paramedic: 64 (15.6%)	
Experience (years)	—	7.3 ± 4.1
Working hours/week	—	58.7 ± 10.2
Shift length >12 hrs	—	280 (68.3%)

Table 2: Stress Level Distribution by Profession

Profession	Low Stress n (%)	Moderate Stress n (%)	High Stress n (%)	Mean PSS ± SD
Doctors	36 (17.7)	112 (55.2)	55 (27.1)	25.1 ± 6.5
Nurses	21 (14.7)	84 (58.7)	38 (26.6)	26.2 ± 5.9
Paramedics	6 (9.4)	55 (85.9)	3 (4.7)	21.3 ± 6.0

Table 3: Coping Strategies and Mean Stress Scores

Coping Type	Frequency n (%)	Mean PSS ± SD	p-value
Problem-focused	173 (42.1)	22.5 ± 5.4	<0.001
Emotion-focused	149 (36.4)	25.8 ± 5.7	<0.001
Avoidant	88 (21.5)	28.1 ± 6.6	<0.001

Table 4: Workplace Factors and Stress Correlations

Variable	Correlation (r)	p-value
Working hours/week	0.43	<0.001
Job satisfaction	-0.51	<0.001
Staffing adequacy	-0.38	<0.001
Work-life balance	0.46	<0.001

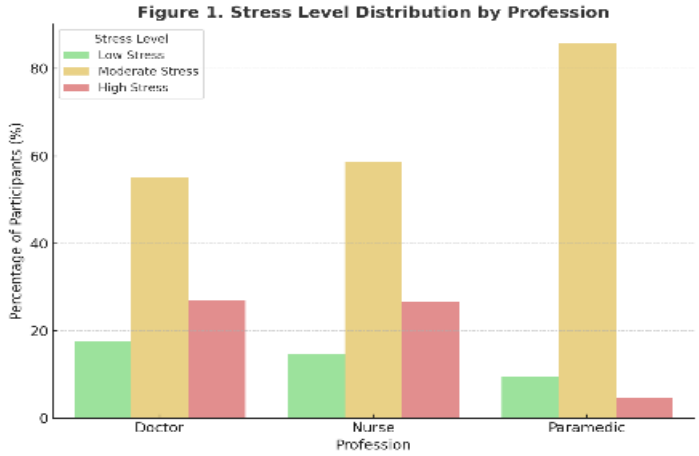

Figure 2 Stress Level Distribution by Profession

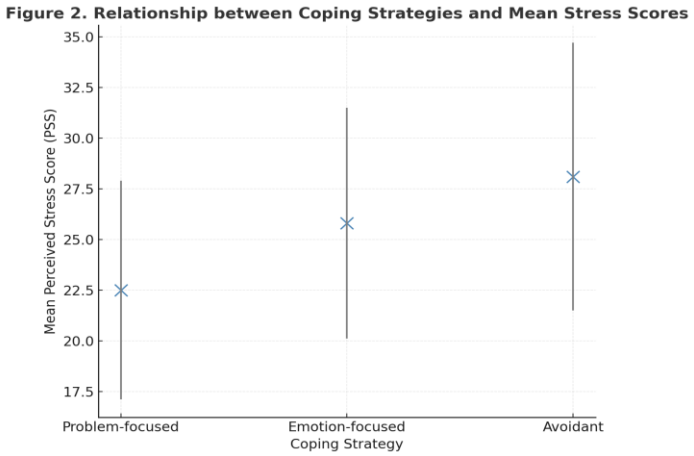

Figure 1 Relationship Between Coping Strategies and Mean Stress Scores

Discussion

The findings of this study revealed a high prevalence of occupational stress among emergency healthcare professionals working in tertiary care hospitals across Pakistan, with notable variation in stress intensity among doctors, nurses, and paramedical staff (14). The

data indicated that excessive workload, time pressure, inadequate rest, and exposure to critical incidents were the predominant contributors to elevated stress levels(15) . Coping strategies such as problem-focused approaches, social support seeking, and adaptive emotional regulation were found to be protective, whereas avoidance and denial-based mechanisms were associated with higher perceived stress scores (16). These results underscored the interplay between occupational demands and coping behaviors, reflecting both individual resilience and systemic deficiencies within the healthcare environment (17).

When compared to international literature, the results were consistent with global trends observed among emergency department (ED) personnel, where high stress levels have been widely documented due to the unpredictable nature of clinical emergencies (18). Studies conducted in the United Kingdom and the United States have similarly reported that emergency physicians and nurses face significantly higher stress compared with professionals in other specialties (19). Comparable findings were observed in South Asian contexts, such as India and Bangladesh, where high patient volumes, limited human resources, and emotional exhaustion were recognized as key stressors (20). However, the current study adds to existing literature by providing empirical data from Pakistan, a region where emergency medicine is still evolving, and where psychosocial well-being of healthcare professionals often receives limited institutional attention (21). The positive association between stress and maladaptive coping aligns with Lazarus and Folkman's stress-coping model, which posits that the effectiveness of coping mechanisms determines emotional and physiological outcomes under stressful conditions. Participants who predominantly employed problem-solving and positive reframing demonstrated lower perceived stress levels, emphasizing the importance of cognitive and behavioral adaptation in mitigating occupational strain (22). Conversely, reliance on emotion-avoidant strategies such as withdrawal or self-blame appeared to perpetuate stress, as similarly observed in studies from Singapore and Saudi Arabia, which highlighted cultural and gender-based influences on coping preferences. The findings also suggest that institutional factors, including team cohesion, leadership support, and work–life balance, critically shape stress responses and coping efficacy. The implications of these findings extend to both clinical and administrative domains. The recognition of occupational stress as a systemic challenge rather than a purely individual issue necessitates organizational interventions aimed at promoting psychological well-being. Implementation of structured debriefing sessions, mindfulness-based resilience programs, and staff rotation systems could substantially alleviate emotional exhaustion. Furthermore, fostering a supportive work culture that encourages open communication and peer assistance may buffer the psychological impact of critical care situations. Regular screening for burnout and stress symptoms could facilitate early intervention and prevent long-term mental health consequences among healthcare workers.

Despite its robust methodology, this study has certain limitations. The cross-sectional design restricted causal inference, making it difficult to establish temporal relationships between stress and coping responses. The reliance on self-reported questionnaires introduced potential reporting and recall biases, as participants might have under- or overestimated their stress levels or coping behaviors. Additionally, the study was conducted within tertiary hospitals located in urban regions, potentially limiting the generalizability of results to rural healthcare settings where work dynamics differ substantially. Nonetheless, the use of validated assessment tools such as the Perceived Stress Scale (PSS) and Brief COPE inventory strengthened the study's reliability, while the adequate sample size enhanced statistical validity and representation. A major strength of this study lies in its comprehensive assessment of both stress levels and coping mechanisms within a high-risk professional group. By simultaneously examining psychological and behavioral parameters, the research provided a multidimensional perspective on occupational health in emergency care. Moreover, the inclusion of diverse healthcare cadres allowed for comparative analysis across different professional roles, highlighting the nuanced experiences of doctors, nurses, and paramedics. Future research should adopt longitudinal or mixed-method approaches to explore causal pathways and identify long-term outcomes of stress exposure in emergency healthcare settings. Intervention-based studies assessing the impact of structured stress management and resilience-building programs would further contribute to evidence-based policy formulation. Expanding the scope to include secondary and primary care professionals may also offer a broader understanding of occupational stress patterns within the Pakistani healthcare system.

Conclusion:

This study demonstrated a high prevalence of occupational stress among emergency healthcare professionals, strongly linked with maladaptive coping strategies. The findings emphasize the necessity of institutional interventions promoting adaptive coping, psychological resilience, and workplace well-being. Establishing structured stress management programs and fostering supportive organizational environments could significantly reduce stress-related morbidity and enhance overall healthcare efficiency.

AUTHOR'S CONTRIBUTIONS

Author	Contribution
Muhammad Salman Riaz*	Designed the study, performed data collection and analysis, and prepared the manuscript. Approved the final draft for submission.
Fiza Waseem	Contributed to study design, data acquisition, interpretation of findings, and performed critical review and editing of the manuscript. Approved the final draft for submission.
Abdullah Masood	Significantly contributed to data collection and analysis. Reviewed and approved the final manuscript for publication.

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