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CHALLENGES FACED BY HEALTHCARE WORKERS IN MANAGING INFECTIOUS DISEASE OUTBREAKS – EXPLORING THE EXPERIENCES AND COPING STRATEGIES OF FRONTLINE MEDICAL STAFF

Original Research

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ABSTRACT

Background: Frontline healthcare workers (HCWs) are often the first and most affected group during infectious disease outbreaks, facing immense physical, emotional, and ethical challenges. Their well-being is essential to effective outbreak response, yet their personal experiences and coping strategies remain underexplored in resource-constrained settings like Pakistan.

Objective: To explore the lived experiences and coping strategies of frontline medical staff managing infectious disease outbreaks in Pakistan.

Methods: This qualitative study was conducted over eight months in major urban centers of Pakistan. Using purposive sampling, 30 HCWs from emergency, intensive care, and infectious disease units were interviewed through semi-structured, in-depth interviews. Thematic analysis was applied using NVivo 12 software. Transcripts were coded inductively, and data were analyzed for emerging patterns under a six-phase analytical framework.

Results: Four main themes were identified: *Emotional Burden*, *Workplace Challenges*, *Coping Mechanisms*, and *Institutional Response*. HCWs reported fear of infection, moral distress, and burnout. Systemic challenges included inadequate PPE, poor administrative communication, and overwhelming workloads. Coping strategies ranged from peer support and spirituality to emotional detachment. Institutional shortcomings such as lack of mental health resources and leadership gaps further intensified stress. Despite these barriers, participants demonstrated resilience through informal support networks and faith-based practices.

Conclusion: The study highlights the urgent need for robust institutional and psychological support systems for HCWs during outbreaks. Tailored policies should address emotional health, safety, and recognition to sustain frontline workers' resilience in future health emergencies.

Keywords: Burnout, Coping Strategies, COVID-19, Emotional Stress, Frontline Healthcare Workers, Infectious Disease Outbreaks, Pakistan, Psychological Adaptation, Qualitative Research, Workload.

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INTRODUCTION

The relentless emergence of infectious disease outbreaks—ranging from SARS and H1N1 to Ebola and most recently, COVID-19—has placed extraordinary demands on healthcare systems globally. While policy and epidemiological discussions often dominate public discourse, the human experiences of frontline healthcare workers during these crises remain less prominently explored (1). Yet, it is these individuals—doctors, nurses, paramedics, and support staff—who constitute the backbone of the emergency response, bearing the psychological, physical, and emotional burdens in ways that few others do. Understanding their lived experiences is vital not only for improving clinical outcomes and preparedness but also for safeguarding the well-being of those expected to respond in future crises (2,3). Frontline medical staff frequently face multifaceted challenges in managing infectious disease outbreaks, including increased workloads, limited protective equipment, ambiguous clinical protocols, and the ethical dilemmas of triage. These challenges are often compounded by fear of contagion, concerns for family safety, and societal stigma. Past outbreaks such as the 2003 SARS epidemic underscored how healthcare workers were disproportionately affected, both in terms of infection rates and psychological distress (4-6).

Studies following that outbreak found significant levels of post-traumatic stress symptoms among staff, often driven by feelings of isolation, fear, and perceived lack of institutional support. During the more recent COVID-19 pandemic, these challenges re-emerged with unprecedented intensity (7,8). Healthcare professionals globally reported feelings of helplessness, moral injury, and burnout, further complicated by rapidly changing guidelines and politicized public health measures. Despite the substantial volume of research addressing the medical and logistical aspects of outbreak management, there remains a notable gap in qualitative investigations that center on the subjective experiences of healthcare providers (9). While quantitative studies have documented rates of anxiety, depression, and other mental health issues, these data alone cannot capture the nuanced reality of what it means to live through an outbreak on the frontlines (10). Qualitative research is uniquely positioned to fill this void, offering depth and context that illuminate not just what is experienced, but how and why. Understanding these perspectives can inform not only better workplace policies and mental health interventions but also improve institutional preparedness and resilience (11).

Coping strategies adopted by frontline staff during outbreaks are diverse and often deeply personal, ranging from structured peer support programs to informal mechanisms such as humor, spirituality, or temporary emotional distancing. Institutional factors such as leadership communication, the availability of mental health resources, and peer cohesion have also been found to play pivotal roles in moderating stress and enhancing coping efficacy (12). However, the availability and effectiveness of these strategies vary widely across contexts, healthcare systems, and individual coping capacities. Furthermore, many healthcare workers report a lack of training and preparation for the emotional and ethical complexities involved in outbreak situations, highlighting a systemic oversight in medical education and emergency preparedness planning (13,14). The growing recognition of mental health as an integral part of occupational safety in healthcare underscores the urgency of this research. Organizations like the World Health Organization have begun to advocate for psychological support systems as part of pandemic preparedness, yet implementation remains uneven. Moreover, cultural, socioeconomic, and institutional factors influence both the experiences and the support mechanisms available to healthcare workers, necessitating localized and contextually sensitive investigations. To address this critical gap in understanding, the present study adopts a qualitative design to explore the experiences and coping strategies of frontline medical staff during infectious disease outbreaks. By giving voice to those who stand at the epicenter of these health emergencies, this research aims to provide a richer, more human-centered understanding of their challenges and resilience. The objective of the study is to explore, in depth, the lived experiences and coping mechanisms of frontline healthcare workers, thereby informing the development of more effective support systems and policies tailored to their unique needs during infectious disease crises.

METHODS

This qualitative study was designed to explore the lived experiences and coping strategies of frontline healthcare workers during infectious disease outbreaks, specifically within the context of healthcare settings across various regions of Pakistan. Conducted over an eight-month period from March to October, the research focused on understanding the subjective experiences, emotional burdens, and adaptive mechanisms employed by medical staff who directly managed patients during outbreak scenarios, including those related

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to COVID-19 and other high-risk infectious diseases. A purposive sampling strategy was employed to recruit participants who had firsthand exposure to outbreak-related clinical duties. The sample included doctors, nurses, paramedics, and ward assistants actively working in isolation wards, emergency departments, intensive care units, and infectious disease units of tertiary-care hospitals located in major urban centers such as Lahore, Karachi, Islamabad, and Peshawar. Inclusion criteria mandated that participants had at least six months of frontline experience during an infectious outbreak, were currently employed in a clinical role, and were willing to participate in a one-on-one, in-depth interview. Exclusion criteria included healthcare workers not directly involved in outbreak-related care and those who were currently on leave or secondment (2). A total of 30 participants were ultimately recruited, a sample size deemed sufficient based on the principle of data saturation, where no new themes emerged during the final stages of analysis.

Data collection was conducted through semi-structured, in-depth interviews that provided flexibility while ensuring thematic consistency across interviews. A well-crafted interview guide was developed based on existing literature and expert input, including open-ended questions addressing emotional experiences, work-related challenges, coping strategies, interpersonal dynamics, and perceived support systems during outbreak situations. Interviews were conducted face-to-face or via encrypted video conferencing platforms, depending on participant preference and public health considerations. Each interview lasted between 45 to 75 minutes and was audio-recorded with participant consent. Field notes were also taken to document non-verbal cues and contextual observations. The data collection tool underwent pilot testing with three participants to ensure clarity, cultural relevance, and alignment with the study objectives. Minor revisions were made based on feedback, particularly in wording and flow of questions. The final interview guide emphasized narrative depth, allowing participants to recount events and reflections in their own words. All interviews were transcribed verbatim in the original language spoken—either Urdu or English—and where necessary, translated into English for analytical consistency. Thematic analysis was chosen as the primary method of data interpretation, following the six-phase approach proposed by Braun and Clarke (15). The process involved familiarization with the data, initial coding, searching for themes, reviewing themes, defining and naming themes, and finally, producing the report. NVivo 12 software was used to organize and manage qualitative data, ensuring a systematic coding process and enabling easy retrieval of data segments. Investigator triangulation was also employed, where multiple researchers independently coded the transcripts to enhance reliability and minimize subjective bias. Discrepancies in coding were resolved through group discussions until consensus was reached.

To ensure methodological rigor, strategies such as member checking, peer debriefing, and audit trails were employed. Participants were given the opportunity to review their transcripts and the preliminary findings to validate interpretations. An external qualitative researcher reviewed the coding framework and thematic structure for transparency and credibility. Ethical approval for the study was obtained from the Institutional Review Board (IRB) of the relevant institute. All participants provided informed written consent before participation, and confidentiality was maintained through pseudonyms and secure data storage protocols. Participants were also informed of their right to withdraw at any point without any consequences. The primary outcome measures of the study were thematic insights related to the emotional, psychological, and professional experiences of healthcare workers, as well as the coping strategies—both formal and informal—utilized during periods of outbreak response. These themes were further analyzed in relation to contextual variables such as role, workplace setting, and institutional support mechanisms, providing a nuanced understanding of how frontline staff navigate the complexities of healthcare crises. This methodology was intentionally crafted to provide a comprehensive, ethically grounded, and culturally sensitive examination of the phenomenon, allowing for rich, experiential data that can inform both policy and practice in outbreak preparedness and support strategies for healthcare workers in Pakistan and similar resource-constrained settings.

RESULTS

A comprehensive thematic analysis of the interview data yielded four overarching themes, each comprising multiple subthemes that reflected the complexity and depth of the participants' lived experiences. These themes include **Emotional Burden**, **Workplace Challenges**, **Coping Mechanisms**, and **Institutional Response**.

The theme **Emotional Burden** was widely expressed across all participant narratives, encompassing the subthemes **Fear of Infection**, **Moral Distress**, and **Anxiety and Burnout**. Healthcare professionals consistently described the fear of contracting the virus and transmitting it to family members as a constant psychological weight. One participant shared, *"Every time I left the hospital, I felt like a ticking time bomb around my children."* Moral distress emerged prominently in accounts of resource scarcity, particularly regarding difficult decisions on patient prioritization during peak caseloads. Emotional exhaustion was a frequent sentiment, as echoed by another nurse who stated, *"You come home but leave your soul in the ward."*

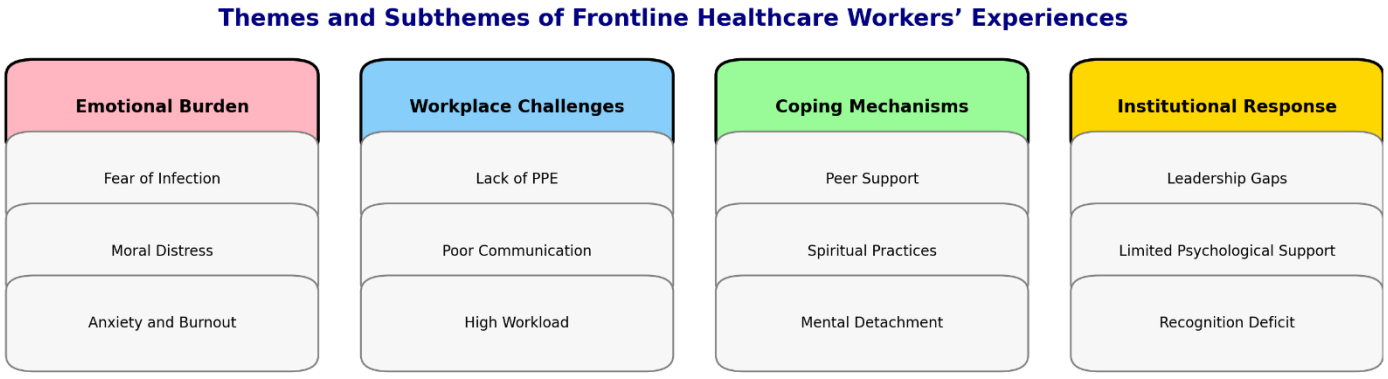
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The second major theme, **Workplace Challenges**, included **Lack of PPE**, **Poor Communication**, and **High Workload**. Participants recalled being issued expired masks, inadequate sanitizers, and inconsistent updates regarding treatment protocols. In some cases, critical communication breakdowns between administrative and clinical staff exacerbated confusion. A junior doctor remarked, *"There were days we didn't know which protocol to follow because it changed every hour."* High patient-to-staff ratios, long shifts, and staff shortages contributed to physical fatigue and mental strain, further intensifying workplace stress.

Under the theme **Coping Mechanisms**, several adaptive strategies were identified. **Peer Support** surfaced as a powerful buffer against emotional collapse, where informal team bonding, shared humor, and mutual encouragement created a sense of unity. A participant noted, *"It was the little things—a pat on the back, a shared joke—that got us through the hardest shifts."* **Spiritual Practices** were also cited as crucial, particularly in providing hope and purpose amid suffering. Some described daily prayers and reliance on religious faith as essential sources of inner peace. **Mental Detachment**, though controversial, appeared as a pragmatic survival strategy, with individuals deliberately disengaging emotionally to preserve their functioning in the workplace.

The final theme, **Institutional Response**, encapsulated systemic factors impacting healthcare workers. Subthemes included **Leadership Gaps**, **Limited Psychological Support**, and **Recognition Deficit**. Many felt a lack of visible leadership and clear directives during the outbreak's early stages. Psychological support, although discussed in official policy, was largely inaccessible or poorly implemented in practice. Several participants expressed disillusionment at the absence of formal acknowledgment or compensation for their sacrifices. One doctor stated, *"We were clapped for on TV but forgotten in our own hospitals."* These findings collectively reveal a landscape where frontline healthcare workers navigated an emotionally charged and logistically strained environment with remarkable resilience. Their voices underscore the urgent need for structured support systems that go beyond material provisions to include psychological reinforcement and institutional accountability.



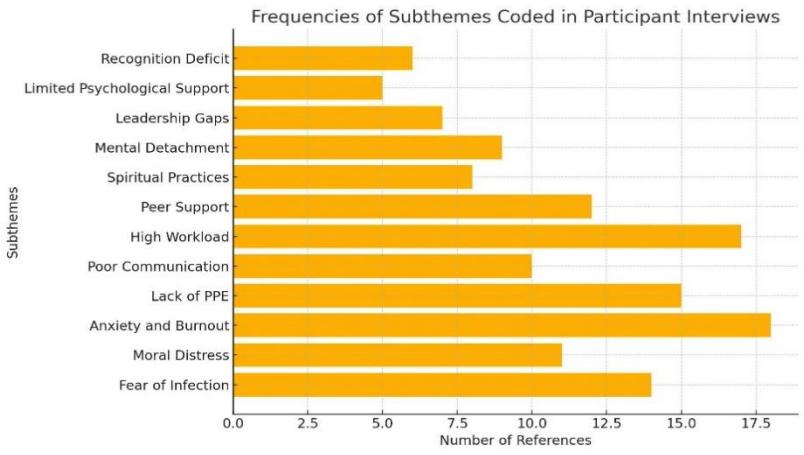


Figure 1 Frequency of Subthemes Coded in Participants Interviews

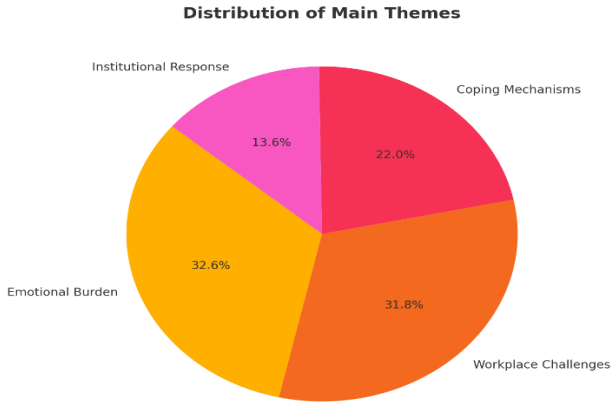


Figure 2 Distribution of Main Themes

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DISCUSSION

The findings of this study reveal the deeply personal and multifaceted experiences of frontline healthcare workers during infectious disease outbreaks, echoing and expanding upon existing research in this area. The emotional burden experienced by participants, characterized by fear of infection, moral distress, and psychological fatigue, aligns closely with prior studies conducted during the COVID-19 pandemic and other outbreaks. For instance, a study found that uncertainty, anxiety, and the fear of transmitting the virus to loved ones were dominant psychological stressors among frontline workers in Latin America, much like those observed in the present study (15,16). The challenges related to resource shortages and organizational communication mirrored those reported globally. A study documented widespread concern over the inconsistent availability of personal protective equipment (PPE) and inadequate administrative support, resulting in significant psychological distress (17). Healthcare workers in Italy reported heightened stress, insomnia, and emotional exhaustion due to overwork and the absence of reliable guidance, further reinforcing the universality of these stressors (18).

The coping mechanisms identified in this study—peer support, spiritual engagement, and emotional detachment—reflect a range of adaptive strategies consistent with those reported elsewhere. Frontline workers frequently relied on personal prevention measures, expert psychological support, and institutional resources as means of coping (19). Religious or spiritual coping was particularly prominent in the Pakistani context, corroborated by findings from a study noted that, emotional resilience was often grounded in faith-based practices and cultural values (19,20). Institutional shortcomings—namely poor leadership visibility, lack of mental health services, and inadequate recognition—emerged as significant contributors to distress. These results are consistent with those of a study which emphasized that, frontline workers felt undervalued and excluded from decision-making processes, which undermined their sense of agency and organizational trust (21,22). Moreover, the critical role of structured support systems and proactive communication in mitigating psychological stress, elements that were largely absent in the context of this study (23).

Among the strengths of this study is its use of in-depth qualitative methodology, allowing for a rich, contextualized understanding of the experiences of Pakistani healthcare workers—an underrepresented group in global literature. The inclusion of diverse clinical roles and geographical representation enhances the transferability of findings within similar low- and middle-income settings. Additionally, methodological rigor was upheld through techniques such as member checking, triangulation, and peer debriefing, ensuring the credibility and trustworthiness of the results Nonetheless, several limitations merit attention. The sample, while diverse in role and location, may not fully capture the experiences of rural or private-sector healthcare workers, whose challenges may differ significantly. Social desirability bias may have influenced participants' willingness to disclose vulnerabilities, particularly concerning mental health. Moreover, the findings are limited to the context of outbreaks experienced in the recent past and may not reflect long-term psychological outcomes or systemic reforms post-crisis. Future research should consider longitudinal qualitative approaches to examine how coping mechanisms and psychological resilience evolve over time. Comparative studies across healthcare systems with varying levels of infrastructure could yield insights into context-specific interventions. There is also a pressing need for intervention-based qualitative research to evaluate the impact of institutional support measures—such as counseling services, recognition initiatives, and team-based debriefings—on healthcare worker well-being during and after public health emergencies. In conclusion, this study contributes to the growing body of evidence highlighting the psychological and organizational challenges faced by frontline healthcare workers during infectious disease outbreaks. By centering their narratives, it underscores the urgent need for multidimensional support systems that address both the emotional labor and structural deficiencies encountered in high-stakes clinical environments.

CONCLUSION

This study illuminated the complex emotional and operational challenges faced by frontline healthcare workers during infectious disease outbreaks, particularly within Pakistan's healthcare system. It underscores the urgent need for integrated institutional support, mental health services, and recognition frameworks. By capturing their lived experiences and coping strategies, the research offers valuable insights to inform future policies and interventions that prioritize the well-being and resilience of healthcare providers in crisis settings.

AUTHOR CONTRIBUTION

Author	Contribution
Muhammad Majid Kanwar*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Hafzah Shah	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Sadaf Riaz	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Sana Ilyas	Contributed to Data Collection and Analysis

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	Has given Final Approval of the version to be published
Saima Mumaraz	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Saul Suleman	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published

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