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Professional Roles, Challenges, and Adaptive Resilience of Neurosurgical Teams in Delivering Service Excellence Within Resource-Limited Hospital Settings

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Abstract

Introduction: Neurosurgical services in Class B hospitals present a high level of complexity due to limitations in technology, facilities, and human resources. This study aims to explore the subjective experiences of neurosurgical medical teams, comprising neurosurgeons, nurses, anesthetists, medical equipment technicians, and operating room managers, in interpreting their roles, confronting challenges, and developing adaptive strategies to support excellent healthcare services at a Class B hospital. **Methods:** Employing a qualitative phenomenological approach, data were collected through in-depth interviews and analyzed thematically following Colaizzi's method. **Results:** The findings indicate that service excellence in neurosurgical care within a resource-limited hospital is maintained through the dynamic interaction between professional meaning-making, persistent multidimensional challenges, and adaptive resilience strategies. While individual and team-level adaptations effectively sustain daily performance, limited systemic support poses challenges to long-term sustainability. **Conclusion:** Overall, the study highlights that the success of excellent neurosurgical services in Class B hospitals depends more on personal resilience and team cohesion than on systemic support alone. **Recommendation**: It recommends systemic improvements in management, human resource policies, integrated communication systems, and sustainable psychosocial support to ensure the continuity of high-quality services amid structural limitations.

Keywords: phenomenology, neurosurgery, excellent service, medical team

INTRODUCTION

Neurosurgical care represents one of the most complex and high-risk domains of healthcare, requiring advanced technology, highly specialized skills, multidisciplinary collaboration, and rapid clinical decision-making under critical conditions. In resource-limited settings, particularly in low- and middle-income countries (LMICs), these demands are often unmet due to systemic constraints. In Indonesia, neurosurgical services provided in Class B hospitals—equivalent to mid-level or secondary referral hospitals—frequently operate with limited infrastructure, human resources, and managerial support (1-2). Such limitations pose significant challenges to the delivery of service excellence, which emphasizes patient safety, satisfaction, and quality outcomes (3-4).

Previous studies have highlighted burnout as a critical internal challenge among surgical teams, particularly in high-pressure clinical environments (2). A study demonstrated a strong association between healthcare worker burnout, compromised patient safety, and reduced quality of care, underscoring the systemic implications of workforce well-being for service excellence (5). Within neurosurgical practice, service excellence extends beyond technical precision to include effective interprofessional coordination, ethical integrity, and empathic engagement among team members (6). Neurosurgical teams routinely function in high-stress environments where time-sensitive decisions and seamless teamwork are essential for patient outcomes (7). However, insufficient organizational and managerial support often exacerbates fatigue, burnout, and communication breakdowns (8).

While existing literature has extensively examined burnout, patient safety, and organizational performance in surgical settings, there remains a limited understanding of how neurosurgical teams working in mid-level, resource-constrained hospitals subjectively experience their roles, interpret systemic challenges, and develop adaptive strategies to sustain service excellence. In particular, the lived experiences and meaning-making processes of multidisciplinary neurosurgical teams have been underexplored.

To address this gap, the present study explores the lived experiences of neurosurgical operating teams in a Class B hospital, focusing on how they construct professional meaning, navigate technical, structural, and psychosocial challenges, and develop adaptive strategies to deliver optimal patient care within a constrained healthcare system

OBJECTIVE

To explore the lived experiences of neurosurgical operating team members in a resource-limited hospital setting, focusing on how they construct professional meaning, experience multidimensional challenges, and develop adaptive strategies to sustain service excellence.

METHOD

Design

This study adopted a qualitative phenomenological design to explore the lived experiences of neurosurgical operating team members and the meanings they construct regarding their professional roles and challenges (9). Phenomenology was chosen to capture participants' subjective perspectives within the complexity of everyday clinical practice, particularly in a resource-limited hospital setting. Using Colaizzi's method, the analysis focused on identifying essential themes that reflect shared meanings and adaptive experiences related to service excellence.

Informants

The study was conducted at a Class B private hospital located in Cilegon, Indonesia. Participants were drawn from five professional groups integral to neurosurgical operations, including neurosurgeons, anesthetists, scrub nurses, medical equipment technicians, and operating room managers.

Purposive sampling was employed to ensure the inclusion of information-rich participants who were directly involved in neurosurgical service delivery and possessed in-depth experiential knowledge of the phenomenon under study. Eligibility criteria included a minimum of three years of experience in neurosurgical services to ensure adequate exposure to the clinical,

organizational, and psychosocial dimensions of neurosurgical practice.

A total of six participants were recruited, representing diverse professional perspectives within the neurosurgical operating team. Data collection continued until thematic sufficiency was achieved, whereby no substantially new insights emerged from subsequent interviews. This sample size was considered appropriate for phenomenological inquiry, which prioritizes depth of understanding over numerical representation.

Data Collection process

Data were collected through in-depth semi-structured interviews using open-ended questions to facilitate rich and detailed accounts of participants' lived experiences. The interview guide was developed based on the study objectives and relevant literature on professionalism, service excellence, and healthcare team dynamics, while allowing flexibility for participants to elaborate on issues they considered important.

Interviews explored participants' perceptions of their professional roles, encountered technical, structural, and psychosocial challenges, experiences of interprofessional teamwork, and adaptive strategies employed in daily clinical practice. Probing questions were used to clarify meanings, elicit deeper reflections, and capture contextual details of participants' experiences.

Each interview lasted approximately 45–60 minutes and was conducted in a private setting within the hospital to ensure confidentiality and minimize interruptions. All interviews were audio-recorded with participants' informed consent and subsequently transcribed verbatim for analysis. Field notes were taken during and immediately after the interviews to document non-verbal cues, contextual observations, and preliminary analytic reflections, thereby enhancing data richness and rigor.

Data Analysis

Thematic analysis followed Colaizzi's (9) seven-step method, including transcription, extraction of significant statements, formulation of meanings, clustering of themes, and validation by participants. Data analysis emphasized the essence of lived experience while ensuring credibility and dependability through member checking and triangulation.

Ethical Considerations

Ethical approval was obtained from the hospital's ethics review board. Informed consent, confidentiality, and voluntary participation principles were strictly observed throughout the study.

RESULTS

Six participants representing key professional roles within the neurosurgical operating team including neurosurgeons, anesthetists, scrub nurses, medical equipment technicians, and operating room managers were interviewed. Data were triangulated through in-depth interviews, non-participant observation, and document review. Three interrelated themes emerged from the analysis: professional meaning-making, multidimensional challenges, and adaptive and resilience strategies**.**

Theme 1: Professional Meaning-Making Beyond Technical Roles

Participants consistently described their professional roles as extending beyond technical task execution toward ethical responsibility, collective commitment, and patient-centered accountability. Across professions, professionalism was understood as a moral obligation to safeguard patient safety and quality of life despite systemic limitations

> *"Despite limited facilities, all members expressed a shared commitment to uphold patient safety and service quality."*
>
> *"We are not only operating; we are responsible for the life and recovery of each patient." (Neurosurgeon)*

Interprofessional collaboration was perceived as an essential component of professionalism rather than an organizational requirement. Rapid clinical decision-making, mutual trust, and ethical awareness were repeatedly emphasized as defining features of effective practice in high-risk neurosurgical settings. Observational data further

demonstrated fluid, non-hierarchical interactions among team members during operative procedures, reinforcing the collective construction of professional meaning

> *"Participants described their professional roles as integral components of a patient-centered care system."*
> *"Professionalism is reflected in strong commitment, rapid decision-making, synergistic interprofessional collaboration, and high ethical awareness."*

Theme 2: Interconnected Technical, Structural, and Psychosocial Challenges

Participants reported facing multiple, overlapping challenges that constrained the delivery of service excellence. **Technical challenges** included limited availability of specialized equipment, outdated instruments, and high patient volumes, which increased the risk of fatigue-related errors.

Structural challenges were reflected in suboptimal coordination across departments (emergency unit, ICU, operating room), fragmented communication systems, and limited managerial feedback mechanisms. These systemic gaps often transferred operational pressure onto frontline staff.

Simultaneously, **psychosocial challenges** such as chronic work stress, emotional exhaustion, burnout, and ethical dilemmas were commonly reported. Participants highlighted that these challenges rarely occurred in isolation but accumulated over time, intensifying emotional strain and reducing work efficiency.

> *"Sometimes the pressure is not only from the surgery itself, but from everything around it,"* (Scrub Nurse).

Theme 3: Adaptive and Resilience Strategies at Personal, Collective, and Managerial Levels

In response to persistent constraints, participants described adaptive strategies operating at three levels. At the **personal level**, individuals engaged in stress regulation through reflection, prayer, mindfulness practices, and maintaining positive routines to preserve emotional stability and professional focus. At the **collective level**, informal communication, peer support, and team solidarity emerged as critical resilience mechanisms. Emotional support among colleagues was perceived as more immediately effective than formal institutional systems.

> *"Sometimes, mutual support among us matters more than the system,"* (Scrub Nurse).

At the **managerial level**, adaptive practices included flexible shift allocation and prioritization of logistical resources. However, participants noted that structured training, supervision, and psychosocial support programs remained limited and inconsistently implemented

DISCUSSION

This phenomenological study provides an in-depth understanding of how neurosurgical operating teams in a resource-limited hospital construct professional meaning, experience multidimensional challenges, and develop adaptive strategies to sustain service excellence. The findings highlight that, within constrained structural conditions, the delivery of high-quality neurosurgical care relies heavily on ethical commitment, interprofessional cohesion, and collective resilience rather than on organizational capacity alone.

Professional Meaning-Making as Ethical and Collective Practice

he findings demonstrate that participants perceived their professional roles not merely as technical responsibilities but as ethical and moral commitments to patient safety and quality of life. This aligns with Donabedian's classic framework, which emphasizes that quality of care emerges from the interaction between structure, process, and outcomes, with professional conduct playing a critical role in shaping care processes (10). In this study, professionalism was enacted through rapid clinical decision-making, ethical awareness, and strong

interprofessional collaboration, particularly under conditions of limited resources.

Consistent with phenomenological perspectives, professional meaning was co-constructed through shared experiences rather than dictated by formal job descriptions (11). The fluid and non-hierarchical teamwork observed among neurosurgeons, nurses, anesthetists, and technical staff reflects contemporary literature emphasizing the importance of collaborative practice in high-risk surgical environments (7). This collective orientation suggests that professionalism in neurosurgical care extends beyond individual competence to include relational and moral dimensions embedded in everyday practice.

Multidimensional Challenges in Resource-Limited Neurosurgical Care

Participants described technical, structural, and psychosocial challenges as deeply interconnected rather than isolated barriers. Equipment shortages, high workloads, and outdated infrastructure constrained clinical performance, echoing reports that mid-level hospitals in low- and middle-income countries (LMICs) often face disproportionate pressure in delivering specialized surgical services (1,6).

Structural challenges—such as fragmented communication and limited managerial feedback—further intensified operational strain. Similar findings have been reported in studies on surgical safety culture, which highlight how system fragmentation increases the cognitive and emotional burden on frontline teams (2). In this context, organizational gaps were frequently compensated for by individual and team-level efforts, shifting systemic responsibility onto healthcare workers.

Psychosocial challenges, including burnout, emotional exhaustion, and ethical dilemmas, were prominent across professional roles. These findings are consistent with Maslach and Leiter's conceptualization of burnout as a response to chronic workplace stressors arising from excessive demands and insufficient organizational support (8). Prior research has also demonstrated a strong association between clinician burnout and compromised patient safety and quality of care (5,12), reinforcing the relevance of addressing psychosocial well-being as a core component of service excellence.

Adaptive and Resilience Strategies Across Multiple Levels

The study reveals that neurosurgical teams employ adaptive strategies at personal, collective, and managerial levels to sustain performance under pressure. At the personal level, coping mechanisms such as reflection, mindfulness, and spiritual practices were used to manage stress and preserve professional focus. These findings align with Lazarus and Folkman's transactional model of stress and coping, which emphasizes appraisal and adaptive responses to environmental demands (13).

At the collective level, informal communication, peer support, and team solidarity emerged as central resilience mechanisms. This collective resilience reflects the concept of social and psychological capital, whereby shared trust and mutual support enhance team functioning in high-risk environments (14). Notably, participants often perceived these informal mechanisms as more effective than formal organizational systems, highlighting the critical role of relational dynamics in sustaining service delivery.

Managerial adaptation, including flexible shift allocation and logistical prioritization, provided some structural support; however, participants consistently reported limited access to systematic training, supervision, and psychosocial programs. This imbalance suggests that resilience in this setting was largely maintained through bottom-up efforts rather than institutionalized strategies. Similar patterns have been observed in healthcare systems where resilience is treated as an individual responsibility rather than an organizational priority (15)

IMPLICATION

Collectively, the findings suggest that service excellence in neurosurgical care within resource-limited hospitals is sustained through a fragile balance between professional commitment and systemic constraint. While personal and collective resilience enables teams to function effectively in the short term, the absence of robust

organizational support raises concerns about long-term workforce sustainability. Strengthening integrated communication systems, humane human resource policies, and structured psychosocial support is therefore essential to prevent burnout and ensure the continuity of high-quality care

CONCLUSION

In summary, this study underscores that excellence in neurosurgical service delivery in resource-limited hospitals is not solely a function of infrastructure or technology but is deeply rooted in the professional meaning-making and adaptive capacities of healthcare teams. Addressing systemic limitations while institutionalizing support for resilience and interprofessional collaboration is crucial for achieving sustainable, high-quality neurosurgical care

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