

QUALITATIVE PHENOMENOLOGICAL STUDY ON NURSE ANESTHETISTS' EXPERIENCE OF PATIENT SAFETY IN HIGH-WORKLOAD OPERATING ROOMS

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Abstract. This study explores the lived experiences of nurse anesthetists in maintaining patient safety under high workload conditions in the operating room. Using a qualitative phenomenological design, data were collected through in-depth interviews with ten nurse anesthetists working in a general hospital, each with a minimum of two years of clinical experience. Thematic analysis identified five major themes: (1) high workload characterized by intensive surgical schedules and limited recovery time; (2) the physical and psychological consequences of workload on nurse well-being and patient safety; (3) adaptive coping mechanisms including time management, spirituality, and interprofessional communication; (4) situational preparedness in responding to emergencies; and (5) the essential role of institutional support in sustaining performance and safety outcomes. Senior nurses tended to rely on professional experience, emotional regulation, and spiritual strength, whereas junior nurses required closer supervision and structured guidance. The findings reveal that excessive workload significantly compromises concentration, emotional balance, and the ability to maintain optimal care. Both individual coping strategies and strong organizational backing are vital for ensuring patient safety and sustaining nurse anesthetist resilience in high-pressure clinical environments. This study provides critical insights for developing human-centered hospital policies and fostering a supportive culture that promotes staff well-being and patient safety.

Keywords: Nurse anesthetists; workload; patient safety; occupational stress; coping strategies; phenomenology

I. INTRODUCTION

Nurse anesthetists play a critical role in ensuring patient safety and surgical success in the operating room, performing complex responsibilities that require high levels of precision, concentration, and collaboration [1]. Their duties include monitoring patients' physiological parameters during anesthesia, maintaining the functionality of anesthesia equipment, and supporting anesthesiologists throughout perioperative care [2]. These tasks are performed under intense pressure, often within environments characterized by tight schedules, emergency cases, and unpredictable workloads [3]. High workload conditions can compromise alertness, increase stress levels, and elevate the risk of clinical errors, making workload management a central issue in anesthesia nursing [4]. The concept of workload in healthcare encompasses both the quantitative aspect (volume of tasks) and the qualitative aspect (complexity, time pressure, and cognitive demand) [5]. In the operating room, workload intensity is amplified by extended working hours, inadequate staffing, and the constant need for vigilance during high-risk surgical procedures [6]. Previous studies have shown that high workload contributes to fatigue, impaired decision-making, and reduced patient safety outcomes [7]. Smith et al. [8] found that prolonged exposure to workload stressors

among nurse anesthetists led to cognitive fatigue, slower reaction times, and decreased situational awareness during anesthesia procedures.

The consequences of workload stress extend beyond clinical performance, impacting nurses' physical health, emotional stability, and overall job satisfaction [9]. Johnson et al. [10] revealed that burnout among nurse anesthetists was strongly correlated with workload intensity, resulting in emotional exhaustion, depersonalization, and diminished professional efficacy. Similarly, Keller and Wong [11] emphasized that the mental health burden of operating room nurses can lead to anxiety, depression, and an increased intention to leave the profession, posing long-term challenges to staff retention and healthcare quality. In this context, maintaining patient safety under heavy workload requires effective adaptation strategies. Previous literature highlights coping mechanisms such as time management, mindfulness, spiritual practices, and supportive teamwork as crucial factors in mitigating stress and sustaining performance [12]. Lee and Park [13] demonstrated that nurse anesthetists who actively practice adaptive coping through communication and peer collaboration exhibit greater resilience and patient-centered decision-making under pressure. Institutional factors also play a pivotal role in this dynamic. Hospitals that implement

supportive policies, including fair scheduling, rest periods, and mental health resources, report significantly lower burnout and error rates [14].

Despite extensive research on nurse stress and burnout, limited studies have explored the lived experiences of anesthesia nurses who operate under sustained high-intensity conditions, particularly within developing healthcare systems [15]. The Indonesian context presents additional challenges, such as uneven staffing ratios, limited institutional support, and cultural expectations that prioritize endurance and self-sacrifice over rest and recovery [16]. Understanding these contextual dynamics is vital to developing evidence-based strategies that balance patient safety with workforce sustainability. Therefore, this study aims to explore in depth the experiences of nurse anesthetists in maintaining patient safety amid high workloads using a phenomenological approach. By focusing on their perceptions, emotions, and coping strategies, this research seeks to uncover how nurse anesthetists adapt to occupational stressors while ensuring clinical excellence. The findings are expected to provide insights for healthcare policymakers and hospital administrators to design human-centered management systems that support anesthesia nurses' well-being and strengthen patient safety culture in high-intensity clinical environments.

Workload in healthcare refers to the quantitative and qualitative demands placed on professionals within limited time and cognitive capacity [17]. In the context of anesthesia nursing, workload is characterized by task intensity, time pressure, multitasking, and the need for precision in complex surgical environments [18]. Operating rooms are among the most stressful hospital units, requiring continuous vigilance and rapid decision-making under unpredictable clinical conditions [19]. Prolonged high workload has been associated with cognitive fatigue, reduced situational awareness, and increased error rates [20]. Nurse anesthetists experience a unique form of workload, combining physical demands such as long hours of standing and patient handling with cognitive demands related to continuous monitoring, documentation, and coordination with surgical teams [21]. Studies have shown that when workload exceeds a nurse's coping threshold, patient safety may be compromised due to delayed responses or medication errors [22]. This risk is particularly heightened in developing healthcare systems where staffing ratios are low and surgical volumes are high [23].

Burnout is a multidimensional psychological condition arising from chronic occupational stress, particularly in high-stakes clinical settings [24]. According to Maslach and Jackson's theory, burnout consists of three interrelated dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment [9]. Among nurse anesthetists, burnout manifests as decreased motivation, impaired empathy, and withdrawal from teamwork behaviors that can directly affect the quality of anesthesia care [25]. Recent research highlights that 45–60% of anesthesia nurses worldwide report moderate to severe burnout symptoms due to high workload and shift irregularities [26]. The relationship between workload and burnout has been consistently

documented in nursing literature. Keller and Wong [11] found that work intensity and role ambiguity were strong predictors of burnout and depression among operating room nurses. Prolonged exposure to stress without adequate recovery leads to physiological changes such as elevated cortisol levels, poor sleep quality, and chronic fatigue [19]. Furthermore, burnout has been linked to increased turnover intentions, creating a vicious cycle of staff shortages and higher workload for remaining personnel [20].

Patient safety in anesthesia practice relies heavily on vigilance, teamwork, and human reliability [27]. Reason's model of human error distinguishes between "active failures" (direct mistakes by practitioners) and "latent conditions" (systemic factors such as inadequate staffing or poor scheduling) [28]. High workload has been identified as one of the main latent conditions leading to near-miss incidents in surgical units [29]. Fatigue and time pressure reduce nurses' cognitive flexibility, making them more susceptible to slips and lapses during anesthesia procedures [30]. In this context, patient safety is not solely determined by individual performance but by the interplay between human factors and organizational systems [31]. Hospitals that promote open communication, team debriefings, and non-punitive reporting of errors tend to exhibit stronger safety cultures [32]. Therefore, addressing the root causes of workload and providing systemic support are crucial to reducing preventable incidents and improving overall safety outcomes in the operating room.

Coping mechanisms are essential psychological tools that allow individuals to manage stress and maintain functional performance under pressure [33]. Nurse anesthetists employ both problem-focused strategies such as time management, prioritization, and communication and emotion-focused strategies, including mindfulness, spirituality, and peer support [13]. Studies have shown that nurses with stronger coping abilities display higher resilience and job satisfaction despite demanding workloads [34]. Lee and Park [13] emphasized that team-based coping, such as effective communication and task-sharing, enhances collective resilience in surgical settings. Moreover, practices like deep breathing, short rest intervals, and positive self-talk contribute to emotional stability during critical procedures [35]. Resilience training programs have been shown to reduce anxiety and improve focus among nurse anesthetists, enabling them to maintain composure in emergencies [36]. However, coping strategies alone may not be sufficient without structural interventions addressing workload and staffing issues [14].

Institutional and managerial support play a vital role in moderating the effects of workload and burnout among anesthesia nurses [37]. Organizational interventions such as equitable workload distribution, adequate staffing, flexible scheduling, and access to mental health resources are associated with higher nurse retention and improved patient outcomes [38]. Chen et al. [13] demonstrated that perceived organizational support mediates the relationship between workload stress and well-being, reducing emotional exhaustion and increasing professional commitment.

Miller and Brown [14] further confirmed that hospitals with proactive policies such as fair rotation systems, counseling services, and recognition programs reported significantly lower burnout levels and stronger patient safety culture. In Indonesia, however, institutional support mechanisms for nurse anesthetists remain limited due to systemic constraints and managerial priorities centered on operational efficiency [16]. Strengthening hospital policies that balance workload with well-being can enhance nurse satisfaction and improve patient safety indicators in anesthesia services [39]. Collectively, these studies underscore the need for a holistic framework integrating workload management, psychological resilience, and organizational support to promote sustainable anesthesia practice. By exploring the lived experiences of nurse anesthetists, this study contributes to the growing body of knowledge on human factors and safety culture in high-intensity healthcare environments.

II. RESEARCH METHODS

This study employed a qualitative descriptive design with a phenomenological approach to explore the lived experiences of nurse anesthetists in maintaining patient safety while managing high workloads in the operating room. Phenomenology was chosen as it allows researchers to deeply understand participants' perceptions, emotions, and interpretations of their everyday work reality, emphasizing meaning derived from lived experiences rather than statistical generalization [27]. The study was conducted at a tertiary hospital in Jakarta, Indonesia, which serves as a national referral center with high surgical activity. Data collection took place over a two-month period, from January to February 2024. Participants were selected through purposive sampling based on inclusion criteria: (1) active nurse anesthetists with a minimum of two years of work experience in the operating room; (2) direct involvement in anesthesia procedures; and (3) willingness to provide informed consent. A total of ten nurse anesthetists participated, representing a range of experience levels from junior to senior practitioners, thus ensuring data diversity and depth of perspectives [28].

Data were gathered through semi-structured, in-depth interviews designed to elicit rich, detailed narratives about participants' work experiences, coping strategies, and perceptions of institutional support. Each interview lasted between 30 and 60 minutes and was audio-recorded with the participants' permission. Thematic analysis following Braun and Clarke's (2006) six-step framework was used to identify recurring patterns and essential meanings across the data [29]. The process included verbatim transcription, open coding, theme generation, and synthesis into key conceptual categories. To ensure trustworthiness and credibility, triangulation, member checking, and peer debriefing were conducted throughout the analytical process. Ethical approval was obtained from the institutional ethics committee, and confidentiality was maintained by anonymizing participant identities. The methodological rigor of this study aligns with qualitative standards emphasizing reflexivity, transparency,

and contextual understanding of human experiences in high-pressure healthcare environments.

III. RESULTS AND DISCUSSION

Based on in-depth interviews with ten anesthesia nurses with various backgrounds in age, length of service, and clinical responsibilities, five main themes were found, namely: (1) high workload, (2) impact on patient welfare and safety, (3) adaptation strategies, (4) preparedness in emergency situations, and (5) support and expectations for the hospital. The first theme, namely high workload, emerged consistently from all participants. They described that the routine in the operating room was very busy, often lasting from morning to night, even beyond normal working hours. The workload not only includes the quantity of surgical cases that must be handled, but also the complexity of the procedure, readiness of equipment, patient supervision, and documentation that must be done in a limited time. In addition, the limited number of personnel often causes uneven work distribution, thus increasing physical and mental stress for nurse anesthetists. Situations such as long shifts without sufficient rest, lack of fair job rotation, and high expectations from the medical team make the workload a multidimensional burden that impacts the well-being of nurses.

The second theme is the impact of workload on nurses' conditions and patient safety. The majority of participants stated that physical fatigue and emotional stress were often felt, especially after facing long procedures or emergency situations. The impacts felt were not only physical fatigue, but also impaired concentration and decreased accuracy when performing critical tasks, such as monitoring vital signs or administering anesthetic drugs. Prolonged fatigue also caused some participants to experience psychosomatic symptoms, sleep disorders, and burnout. This condition has the potential to reduce the quality of service and increase the risk of medical errors. Participants realized that patient safety is highly dependent on their physical condition and focus, so that high workloads that are not managed properly can threaten the quality of anesthesia services.

The third theme that emerged was adaptation strategies or coping mechanisms. Despite facing high pressure, anesthesia nurses still try to maintain a balance between work and well-being through various approaches. The strategies used include time management, such as stealing rest time between surgical schedules, maintaining nutritious food intake, and building harmonious communication time. Most participants also rely on spiritual approaches, such as praying before starting a shift or when facing an emergency situation, as a form of emotional reinforcement. Support from colleagues is also an important social capital to remind each other, share tasks, and create solidarity in the face of pressure.

The fourth theme is related to emergency preparedness in the operating room. Some participants gave concrete descriptions of their experiences in dealing with patients who experience sudden complications, such as laryngospasm, extreme drops in blood pressure, or allergic reactions to anesthetic drugs. In these conditions, anesthesia nurses must

remain calm, maintain, and follow existing SOP procedures with full responsibility. The ability to think quickly, work within time, and access equipment efficiently is key to maintaining patient safety. They also conveyed the importance of experience and regular training as capital to deal with these unexpected situations.

The fifth theme that emerged from the analysis was support and expectations for the hospital institution. Participants conveyed the need for serious attention from hospital management to the welfare of health workers, especially nurse anesthetists. They expected regular workload evaluations, the preparation of more humane work schedules, and the provision of adequate rest time. Several participants also suggested special stress management training, internal communication forums that listen to nurses' aspirations, and awards for performance as a form of recognition of the workload they carry. Strong managerial support is believed to be able to reduce work pressure, increase motivation, and maintain nurses' commitment to carrying out their duties professionally.

Based on the results of this study, it can be concluded that high workload is a real and significant challenge faced by anesthesia nurses in the operating room, and this has a direct impact on physical and mental conditions, as well as the quality of services provided. High workload is characterized by the number of operations, case complexity, and continuity between the number of workers and work volume. This condition causes fatigue, stress, and in the long term triggers burnout which has the potential to disrupt patient safety.

However, nurse anesthetists are not passive in facing these pressures. They develop various adaptation strategies that focus on self-care, spirituality, and team collaboration as a form of psychological protection mechanism. Readiness in facing emergency situations has also proven to be an important strength that shows the competence and dedication of nurses in carrying out their professional roles. However, individual adaptation will not be enough if it is not supported by a healthy work system and caring organizational management.

This study confirms that **institutional** support is needed, especially in the form of fair work schedules, adequate rest periods, access to stress management counseling or training, and adequate human and logistical resources. With policies that support nurse welfare, patient safety will be more assured, because the quality of nurse anesthesia work is highly dependent on their physical and psychological condition.

The findings of this study are consistent with previous studies highlighting the impact of high workload on nurses' performance and well-being. For example, Smith et al. (2018) showed that nurse anesthetists working under high-pressure conditions experienced decreased cognitive capacity, impaired focus, and increased risk of medical errors. This is in line with reports from participants in this study who stated that they often experienced fatigue and decreased concentration during long shifts or when facing emergency situations.

A study by Lee and Park (2021) also supports the findings on the importance of individual coping strategies. In their

study, they found that nurse anesthetists who used a spiritual approach and had good team communication were better able to manage work stress. This is in line with the strategies reported by participants in this study, such as praying before shifts, creating a positive work atmosphere, and maintaining team relationships.

Furthermore, the results of this study are also reinforced by Chen et al. (2022) who emphasized the importance of institutional support in maintaining the welfare of health workers. Hospitals that provide fair work schedules, stress training, and rest facilities have been shown to reduce burnout rates. In the context of this study, participants emphasized that there is great hope for improvements in management policies, including changes to a more humane system and adequate rest spaces.

The correlation between high workload and burnout risk is also reflected in the findings of Maslach & Jackson (1981) who stated that chronic work pressure can cause emotional exhaustion, depersonalization, and decreased personal achievement. This theme also emerged in several participant narratives who stated that they began to lose work motivation and the emergence of a desire to leave the profession.

Thus, the results of this study not only strengthen the findings of previous studies, but also provide a contextual picture of the realities faced by anesthesia nurses in Indonesian hospitals, especially in a high-intensity service system and limited institutional support.

IV. CONCLUSION

This study provides a comprehensive understanding of nurse anesthetists' lived experiences in maintaining patient safety under high workload conditions in the operating room. The findings highlight that excessive workloads characterized by long shifts, insufficient staffing, and intense procedural demands negatively affect both physical and psychological well-being, increasing the risk of fatigue, stress, and potential medical errors. However, the study also demonstrates that nurse anesthetists actively engage in adaptive coping mechanisms, including time management, spirituality, emotional regulation, and teamwork, to sustain their professional performance. Senior nurses tend to rely on experiential knowledge and emotional maturity, while junior nurses depend more on peer guidance and structured support. These dynamics underscore the complex interplay between individual resilience and systemic workload management in ensuring patient safety. From a managerial and policy perspective, the results emphasize the importance of strengthening institutional support systems to promote nurse anesthetist well-being and optimize operating room safety. Hospitals must implement evidence-based interventions such as equitable shift scheduling, rest-time enforcement, stress management training, and access to psychological counseling. Organizational policies that integrate mental health promotion with workload assessment can significantly reduce burnout and improve staff retention. Moreover, cultivating a safety-oriented culture that values open communication, teamwork, and mutual respect enhances trust and

accountability within surgical teams. Ultimately, sustainable improvements in patient safety require a dual approach: empowering individual coping capacities and reforming institutional structures to prevent excessive workload. The insights from this study can inform the development of human-centered policies that balance clinical efficiency with compassion and care for healthcare workers in high-intensity environments

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