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WORK ENVIRONMENT MATTERS: ITS ROLE IN BURNOUT AMONG OPERATING ROOM HEALTHCARE PROFESSIONALS

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Abstract

The work environment is a key factor contributing to burnout among healthcare workers, particularly under suboptimal conditions. A mismatch between workers' expectations and the facilities or support provided by hospitals may increase the risk of burnout. This study employed a quantitative analytic correlational design with a cross-sectional approach. The population consisted of 38 healthcare workers, including anesthesiologists and surgical nurses, selected using total sampling. Data were collected using a validated work environment questionnaire (Pearson product-moment test) and the Maslach Burnout Inventory (MBI) to assess burnout levels. Data analysis was conducted using the Spearman rank correlation test. Of the 38 respondents, 55.3% perceived their work environment as good, while 44.7% reported unfavorable conditions. Most healthcare workers (60.5%) experienced mild burnout, whereas 39.5% reported severe burnout. Statistical analysis showed a significant relationship between the work environment and burnout incidence ($p = 0.001 < 0.05$), with a moderate correlation strength ($r = 0.515$). There is a significant moderate relationship between the work environment and burnout among healthcare workers. Improving workplace conditions and aligning organizational support with staff expectations may help reduce burnout. Healthcare workers are also encouraged to adopt positive coping strategies to maintain motivation and manage fatigue. Increasing staffing levels in operating rooms is recommended to reduce workload and prevent burnout.

Keywords: Burnout, Healthcare Workers, Operating Room, Work Environment

1. INTRODUCTION

The operating room is a highly complex and high-risk healthcare setting that requires precision, rapid decision-making, interdisciplinary collaboration, and strict adherence to patient safety protocols. Healthcare professionals working in the Central Surgical Installation (CSI), including anesthesiologists, surgical nurses, anesthesia nurses, circulating nurses, and recovery nurses, are continuously exposed to demanding workloads and psychologically stressful situations. In addition to ensuring surgical success, healthcare workers in operating rooms must maintain sterile conditions and comply with infection prevention standards to reduce the risk of surgical site infections (SSI) and other adverse events [1].

The World Health Organization (WHO) reported that approximately 11% of patients in developing countries experience surgical site infections, and nearly half of these cases are preventable through proper infection prevention and aseptic procedures [2], [3]. Therefore, operating room environments must be adequately maintained with appropriate air circulation, lighting, sterilization systems, and organizational support to ensure patient safety and healthcare worker performance [4], [5]. Previous studies have also demonstrated that educational and

organizational interventions can improve compliance with aseptic techniques and patient safety practices in perioperative settings [6], [7].

Despite these safety efforts, burnout has emerged as a major occupational health problem among healthcare professionals working in operating rooms. Burnout is characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment resulting from prolonged occupational stress. Recent studies have shown a high prevalence of burnout among perioperative healthcare workers, including anesthesiologists, anesthesia technicians, and operating room nurses. Hasan et al. reported that burnout among anesthesia personnel was strongly associated with shift work, high job demands, and heavy responsibilities [10]. Similarly, Alsabani et al. found that more than half of anesthesia technicians experienced moderate to high levels of emotional exhaustion and depersonalization [11]. Burnout not only affects healthcare workers' mental well-being but may also reduce work productivity, increase fatigue, and negatively influence patient safety and quality of care [12], [13].

Several studies have identified the work environment as an important factor associated with burnout among healthcare workers. Poor organizational support, inadequate staffing, ineffective communication, excessive workload, and unfavorable physical working conditions have consistently been associated with higher burnout levels [9], [13]. Sillero and Zabalegui reported that perioperative nurses working in poor work environments experienced higher emotional exhaustion and greater intention to leave their jobs [9]. Other studies also demonstrated that supportive work environments and effective teamwork may improve healthcare workers' psychological well-being and reduce occupational stress [13].

Although numerous studies have explored burnout among healthcare professionals, evidence specifically examining the relationship between work environment and burnout among multidisciplinary operating room healthcare professionals remains limited, particularly in Indonesian perioperative settings. Most previous studies focused on nurses in general wards or intensive care units, while studies involving operating room personnel with different professional backgrounds are still scarce. In addition, limited evidence is available regarding how physical and non-physical work environment conditions in Indonesian operating rooms are associated with burnout among healthcare professionals.

Preliminary observations conducted in the operating room unit showed several environmental and occupational challenges, including suboptimal air conditioning systems, excessive noise, inadequate room layout, and heavy workloads due to limited operating room capacity. Interviews with healthcare professionals also revealed symptoms associated with burnout, such as fatigue, decreased motivation, difficulty concentrating, and delayed work performance. These conditions may potentially affect both healthcare workers' well-being and the quality of perioperative services. Therefore, this study aimed to analyze the relationship between the work environment and burnout among healthcare professionals working in the Central Surgical Installation room.

2. METHODOLOGY

This study employed a quantitative analytic correlational design with a cross-sectional approach. The study was conducted in the Central Surgical Installation (CSI) unit of Hospital X, Indonesia, between January and March 2025. Ethical approval was obtained from the institutional research ethics committee prior to data collection, and permission to conduct the study was granted by the hospital administration.

The study population consisted of 38 healthcare professionals working in the operating room unit, including anesthesiologists, anesthesia nurses, and surgical nurses. Total sampling was applied, resulting in a final sample of 38 respondents.

Data were collected using two questionnaires: a work environment questionnaire adapted and modified from Rosdikasari (2021), and the Maslach Burnout Inventory (MBI) developed by Maslach and Jackson to assess burnout levels. The work environment questionnaire consisted of 22 items covering physical and non-physical work environment aspects. The physical environment domain included air conditioning, air circulation, noise, lighting, humidity, and

facilities, while the non-physical environment domain assessed interpersonal relationships among healthcare workers and leadership support.

The burnout questionnaire consisted of three dimensions: emotional exhaustion (9 items), depersonalization (5 items), and reduced personal accomplishment (8 items). Instrument validity was tested using Pearson Product Moment analysis. The work environment questionnaire demonstrated good reliability with a Cronbach's alpha value of 0.905, while the burnout questionnaire showed excellent reliability with a Cronbach's alpha value of 0.973.

Data collection was conducted directly in the operating room setting. Respondents were informed about the study objectives and procedures before signing informed consent forms and completing the questionnaires. After completion, the questionnaires were checked to ensure completeness.

Data analysis included univariate and bivariate analyses. Univariate analysis was used to describe respondent characteristics and study variables using frequencies and percentages. Normality testing showed that the data were not normally distributed ($p < 0.05$); therefore, median values were used as cut-off points for categorizing work environment and burnout variables.

The relationship between work environment and burnout was analyzed using the Chi-square test. The contingency coefficient (CC) was additionally used to determine the strength of the relationship between variables. Statistical significance was determined at $p < 0.05$.

3. RESULTS

Table 1. *Characteristics of Respondents (n=38)*

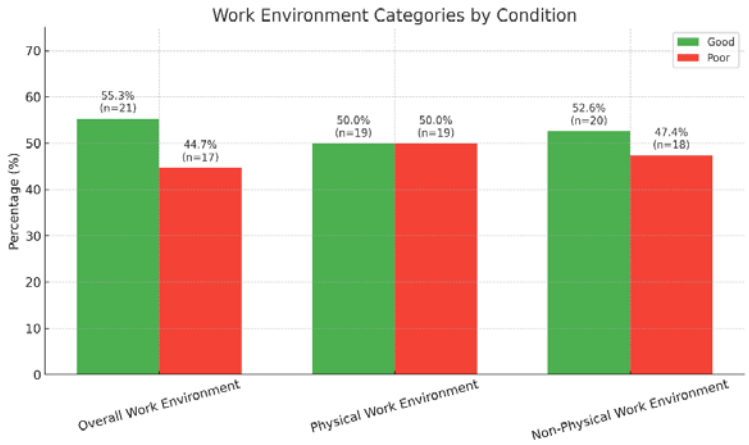
Variable	Frequency	Percentage
Gender		
Man	15	39.5
Female	23	60.5
Level of education		
D3 Nursing	20	52.6
D3 Nursing + Training anesthesia	12	31.6
Bachelor Nursing + Training anesthesia	1	2.6
Ners	5	13.2
Age		
20 - 25 years	1	2.6
26 – 35 years	16	42.1
36 – 45 years	10	26.3
>46 years	11	28.9
Years of service		
1 – 5 years	1	2.6
6 – 10 years	16	42.1
11 – 15 years	7	18.4
>16 years	14	36.2
Employment status		
Civil servants	21	55.3
Non civil servants	17	44.7
Shift work		
2 shift	14	36.8
3 shift	24	63.2

A total of 38 respondents participated in this study. Most respondents were female (60.5%), reflecting the gender distribution commonly found in nursing professions. Most respondents held a D3 Nursing qualification (52.6%), while 31.6% had additional anesthesia training.

The largest age group was 26–35 years (42.1%). In terms of work experience, 42.1% of respondents had worked for 6–10 years, while 36.8% had more than 16 years of work experience.

Most respondents were civil servants (55.3%). Regarding work schedules, 63.2% of respondents worked in a three-shift system consisting of morning, afternoon, and night shifts.

3.1 Work Environment Categories by Condition

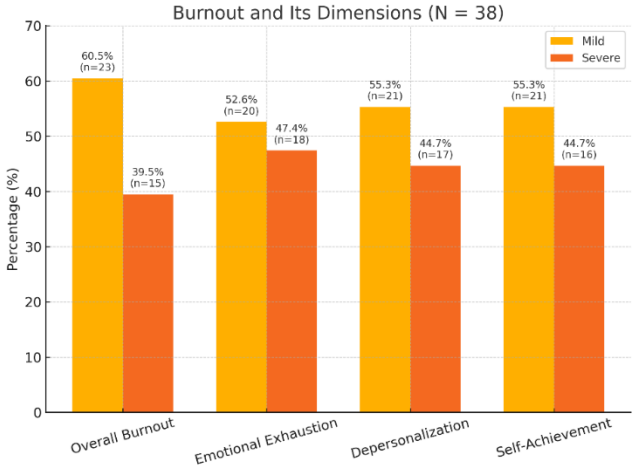


Picture 1. *Work Environment Categories by Condition*

The results showed that 55.3% of respondents perceived their work environment as good, while 44.7% perceived it as poor. In the physical work environment domain, 50.0% of respondents reported good conditions and 50.0% reported poor conditions. In the non-physical work environment domain, 52.6% reported good conditions and 47.4% reported poor conditions.

Several respondents reported concerns related to room air circulation, operating room layout, and the limited use of dedicated operating rooms for infectious patients. Respondents also reported that interpersonal relationships among healthcare professionals and communication with team leaders were generally good.

3.2 Burnout in Dimensions



Picture 2. *Burnout in Dimensions*

Among the 38 respondents, 60.5% (n = 23) experienced mild burnout, while 39.5% (n = 15) experienced severe burnout. Emotional exhaustion showed the highest proportion of severe symptoms, with 47.4% (n = 18) categorized as severe. Similar patterns were observed in depersonalization and reduced personal accomplishment dimensions.

3.3 Relationship between Work Environment and Burnout

Table 2. *Results of the Relationship between Work Environment and Burnout (N=38)*

The work environment	Burnout		Total	P value	A	CC
	Mild	Severe				
Good	18 (47.4%)	3 (7.9%)	21 (55.3%)	0,001	0.05	0.515
Poor	5 (13.1%)	12 (31.6%)	17 (44.7)			
Total	23 (60.5%)	15 (39.5%)	38 (100%)			

A clear relationship emerged between perceived work environment quality and burnout severity. Among nurses who rated their work environment as good, 18 of 21 (≈ 86 %) reported only mild burnout, while just 3 (≈ 14 %) experienced severe burnout. In contrast, of the 17 nurses who perceived their environment as poor, 12 (≈ 71 %) suffered severe burnout and only 5 (≈ 29 %) had mild symptoms.

The association was statistically significant (χ^2, P = 0.001), with a contingency coefficient (CC = 0.515) indicating a moderate-to-strong effect size. Practically, nurses working in a poor environment were almost five times more likely to experience severe burnout than those in a good environment (70.6 % vs 14.3 %), underscoring the critical role of a supportive workplace in mitigating burnout.

4. DISSCUSSION

The characteristics of respondents in this study showed that most participants were female, which reflects the demographic composition commonly found in nursing and perioperative healthcare professions. Respondent characteristics are important to discuss because demographic factors such as gender may influence communication styles, emotional responsiveness, and caring behaviors in healthcare settings. Previous studies have reported that female healthcare professionals often demonstrate stronger empathy, supportive interpersonal interactions, and patient-centered communication during clinical practice.

Previous studies have highlighted that effective communication, empathy, and supportive interpersonal interactions are important components of patient-centered care among healthcare professionals. However, these competencies are influenced by individual, professional, and organizational factors rather than gender alone. [16], [17] Quantitative data from Ethiopia [18] showed significantly higher caring behavior scores in female nurses, attributed to stereotypical nurturing traits. Finally, a Tanzanian qualitative study reported that female nurses excel at rapport, empathy, and holistic communication leading to greater patient comfort. These studies collectively support the assertion that female nurses tend to be more thorough in caring actions, attuned to patient feelings, and effective in providing appropriate and comforting responses.

Recent studies support the notion that healthcare workers aged 26–35 years are better at managing responsibilities, using rational decision-making, and controlling emotions under stress. For example, a study in Indonesia found that workers aged 26–30 (and 31–35) reported moderate levels of work stress during the COVID-19 pandemic, indicating effective task and stress management. [19] In Spain, healthcare professionals aged 26–35 experienced the highest psychological symptoms, reflecting intense engagement and emotional investment in their work [20]. Moreover, research conducted in Turkey highlighted age as a significant modifier in the stress-performance relationship, advocating for age-specific stress management policies.

The work schedule is 3 shifts, namely, morning (07.00–14.00), afternoon (14.00–20.00), and night (20.00–07.00). The morning shift is only elective surgery with an average of 20 patients, if it has not been completed, it is continued by the day shift, the night shift is only CITO surgery and sometimes there is no surgery.

Work Environment Categories by Condition

Work environment as good. According to the researcher's assumption, this is because the operating room is air-conditioned and circulation that functions less optimally, only 2 rooms, the

other 3 rooms function well, most health workers state that the environment is good, namely rarely experiencing problems with air conditioning, circulation, lighting and facilities in the operating room. The operating room for infectious patients is still carried out in a non-infectious operating room, the operating room for infectious patients and non-infectious patients should need to be separated, Hospital X already has an operating room for infectious patients but it has not been used optimally because, there are not enough health workers working for infectious operating rooms and non-infectious operating rooms. [21], [22]

The relationship between health workers has been well established and harmonious, and with the person in charge of the team has also gone well, so it can be said that the work environment in the operating room is in the good category. Hospitals need to calibrate air conditioning, circulate in each operating room and add health workers. [23], [24], [25]

These studies reinforce the notion that a supportive work environment plays a crucial role in nurse performance and task accuracy. A better work environment in an Indonesian hospital directly enhanced nurses' work motivation and performance. [26] Similarly, provided longitudinal evidence that improving hospital work conditions and staffing levels significantly reduced missed care in U.S. settings [27]. A positive work environment boosts employee morale and effectiveness, a poor environment increases errors and planning deficiencies.

Burnout in Dimensions

The results of this study align with various recent studies that highlight the impact of workload, emotional fatigue, and shift work on nurse burnout. The high incidence of burnout found in this study especially in the emotional exhaustion dimension is supported [27], who conducted a cross-sectional study involving 1,268 nurses. They reported that 65.5% of respondents experienced burnout, and those who were affected by shift-work disorder were significantly more likely to report emotional exhaustion, poor mental health, and decreased job satisfaction. Nurses working night shifts and experiencing disrupted sleep cycles were found to have a higher risk of burnout, underscoring the detrimental effects of irregular and prolonged shift patterns on nurses' emotional well-being.

Similar findings in study of Chinese nurses, which identified night shifts and poor sleep quality as significant predictors of increased emotional exhaustion and a decline in self-accomplishment. [28] Notably, the research emphasized that younger nurses particularly those in their early careers were more susceptible to depersonalization and emotional fatigue due to inadequate coping mechanisms and limited professional support. This mirrors the experiences described in our study, where nurses reported fatigue from handling large numbers of elective and emergency (cito) patients throughout the day and night, often without sufficient staff coverage. Such conditions not only lead to physical exhaustion but also reduce motivation and the desire to report to work the following day.

A study in Indonesia focusing on the psychosocial work environment of nurses and found that heavy workloads, interpersonal conflicts, and a lack of managerial support were the main contributors to high levels of emotional exhaustion. Approximately 90% of nurses surveyed in their study reported experiencing significant emotional fatigue. These findings support the notion that an imbalanced workload and poor staffing patterns are closely associated with burnout symptoms across multiple dimensions, particularly emotional fatigue and reduced sense of professional achievement.[29]

Furthermore, this study found that most health workers disagreed with statements suggesting a decline in empathy. In fact, they emphasized that maintaining empathy is critical to patient care nurses with higher self-rated empathy and greater job resources delivered more individualized and patient-centered care. Empathy was not only preserved but also regarded as essential for patient satisfaction and therapeutic engagement.[30] In summary, the findings of this study are consistent with recent evidence that demonstrates the strong link between emotional exhaustion, workload, shift work, and burnout among nurses. These studies support recommendations to revise shift scheduling, ensure adequate staffing, and promote emotional support systems to reduce fatigue and maintain high standards of patient care and nurse well-being.

Relationship between Work Environment and Burnout

According to the researchers' assumptions, a poor work environment can increase the incidence of burnout in health workers. This can happen due to the absence of comfort at work and a less harmonious working atmosphere. Health workers must complete all elective and (emergency) cito surgeries every day, which requires a high degree of precision, concentration and strong physicality.

Operating room (OR) conditions at our site are far from ideal: malfunctioning air-conditioning systems, poor air circulation, insufficient OR capacity relative to daily caseloads, and inadequate separation of infectious cases. Such persistent environmental deficiencies create physical discomfort, elevated cross-infection risk, and excessive workload—all of which are key contributors to burnout among OR personnel. A qualitative study with Japanese operating room nurses reported that long hours, high workloads, and inadequate staffing were major factors in emotional exhaustion and burnout in perioperative settings [29]. A related latent profile analysis of OR nurses in China confirmed that fatigue levels were significantly higher than those of general ward nurses; contributors included prolonged standing, noise exposure, enclosed spaces, and mentally demanding surgical procedures [31]

Organizational deficiencies intensify this risk. A Spanish perioperative nurse study found that poor work environment factors—such as inadequate leadership support, understaffing, and lack of quality care infrastructure—predicted higher rates of emotional exhaustion, depersonalization, and reduced personal accomplishment [32]. Similarly, a Canadian survey of hospital nurses during the COVID-19 pandemic demonstrated that improvements in the work environment were associated with lower emotional exhaustion and decreased intent to leave [33].

Additionally, compassion fatigue—a proxy for burnout—was observed in 64.3% of OR nurses surveyed in China, with night-shift frequency, peer relationships, and psychological resilience identified as significant factors [34]. These findings parallel those from a qualitative review indicating that high-stress environments characterized by heavy workload, poor staffing, and inadequate managerial support are strongly linked to burnout among OR nurses worldwide [35].

5. CONCLUSIONS

It can be concluded that there is a relationship between the work environment and burnout in health workers at the central surgical installation. This can occur because there is still a poor work environment such as less optimal room cooling, less circulation, operating rooms for infectious and non-infectious patients that are still not optimally used and the presence of burnout symptoms such as fatigue after work, a little feeling of boredom at work, difficulty waking up in the morning due to fatigue. It is recommended to hospitals to calibrate air conditioning and circulation and optimize the use of infectious operating rooms, and health workers to restore motivation and enthusiasm at work

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