

Dominant Factors Determining Work Balance and Well-being of Healthcare Professionals in Indonesia.

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Abstract

Medical personnel are a vital component in the healthcare system, playing a crucial role in maintaining and improving patient quality of life. However, demanding work environment dynamics risk triggering work imbalance, stress, and burnout, which ultimately lower the quality of care. This study aims to identify and analyze the dominant factors influencing the work balance and well-being of professional healthcare workers in Indonesia. The method used is a quantitative approach through a structured questionnaire survey. Data were analyzed descriptively, alongside implementing a factor analysis technique based on the Matrix of Cross Impact Multiplications Applied to Classification (MICMAC) method to map complex inter-variable relationships. Validity and reliability tests were conducted with the involvement of health experts and by measuring Cronbach's Alpha. The results showed that sudden patient surges and limited access to health facilities were the two most dominant factors significantly affecting healthcare workers' work balance. Patient surges directly trigger increased workload and the risk of procedural errors, while limited facilities heighten job stress, particularly in remote areas. Conversely, physical environmental factors such as poor temperature/air circulation and sudden staff losses were identified as having a relatively lower impact and were not primary determinants. This study concludes the importance of strengthening strategic policies in the form of effective resource allocation, health infrastructure improvements, and the implementation of flexible HR management systems to maintain the work balance and well-being of healthcare workers in a sustainable manner.

Keywords: Work Balance, Medical Personnel, Burnout, MICMAC Method, Workload.

INTRODUCTION

Medical personnel are a primary component of the healthcare system, playing a crucial role in maintaining, caring for, and improving patients' quality of life. The role of healthcare workers is vital in ensuring the continuity of optimal health services for the community (Denning et al., 2021). In carrying out their duties, medical personnel are not only required to possess strong clinical competence but must also adapt to continuously evolving work environment dynamics. One of the main challenges faced by healthcare workers is maintaining work balance to remain productive and both physically and mentally healthy. A good work balance significantly influences the quality of care provided by medical staff. Imbalances in the workplace can lead to decreased performance, increased stress, and even burnout, which negatively impacts both healthcare workers and the patients they serve (Roth, Berger, Krug, Mahler, & Wensing, 2021).

Various factors can influence the work balance of healthcare personnel, such as workplace environmental conditions, high workload, health policies implemented by institutions, as well as social and economic aspects related to the well-being of medical staff (Imamura et al., 2021). One of the primary factors influencing healthcare

workers' work balance is the work environment. Unsupportive working environments—such as inadequate lighting, uncomfortable room temperatures, high noise levels, and the lack of sufficient medical facilities—can affect productivity and overall well-being (Wolkoff, Azuma, & Carrer, 2021). In addition, inflexible work policies, such as irregular shift schedules and insufficient rest time, can further aggravate the work balance of medical personnel (Dawson, Ferguson, & Vincent, 2021). These factors can elevate occupational stress levels and diminish long-term job satisfaction among healthcare workers.

In addition to working environment factors, policy aspects also play a vital role in creating a healthy work balance for medical personnel. Health policies that do not consider the well-being of healthcare workers—such as excessive workloads without adequate incentives or allowances—can diminish their motivation to perform their duties (Alzoubi et al., 2024). A lack of institutional support regarding stress management training and mental well-being can also heighten the risk of mental health disorders among healthcare professionals (Mail et al., 2024). Therefore, it is imperative for policymakers to design supportive policies that promote work balance among medical staff to enhance healthcare delivery effectiveness. Social factors also contribute to determining healthcare workers' work balance. Interactions with colleagues, patients, and patients' families can serve as a source of support or, conversely, become stress triggers if not properly managed (Azila-Gbetteor, Atsu, & Quarshie, 2022). Workplace conflicts, a lack of effective communication, and pressure from patients and their families can add to the psychological burden on medical staff (Cheng et al., 2021). Thus, building a supportive and harmonious work environment is a crucial step in maintaining healthcare workers' work balance.

Economic aspects also cannot be overlooked in discussing the work balance of medical personnel. Compensation that does not correspond to the workload, a lack of incentives, and uncertainty in the payroll system can impact the motivation and well-being of healthcare staff (Afonso et al., 2022). Many medical workers are forced to work multiple jobs to meet their financial needs, which ultimately leads to exhaustion and reduces the quality of care provided (Martin & Feinberg, 2023). Furthermore, during crisis situations such as pandemics, escalating economic pressures can significantly increase stress levels among medical personnel (Clinton et al., 2022).

In addition to the main factors mentioned above, sudden events such as patient surges, natural disasters, or disease outbreaks can also affect the work balance of healthcare personnel (Shah, Gandrakota, & Cimiotti, 2021). These situations frequently require medical staff to work under high-pressure conditions with limited resources and over extended periods. A lack of preparedness in handling such emergencies can lead to increased fatigue, stress, and a heightened risk of medical errors (Savioli et al., 2022). By understanding the various factors influencing healthcare workers' work balance, this study aims to analyze the current state of work balance among medical personnel in Indonesia, as well as the contributing factors to work imbalance. Utilizing a survey method with structured questionnaires, this study will gather deeper insights into the challenges faced by healthcare professionals and potential solutions to enhance their work balance (Sholihah, Novareza, Wibowo, & Setyanto, 2023). The findings of this study are expected to serve as a foundation for policymakers in designing more effective policies to improve healthcare workers' well-being and the overall quality of public health services.

LITERATURE REVIEW

Work Environment

The work environment plays a crucial role in maintaining healthcare workers' work balance, particularly regarding comfort and productivity. One factor affecting working conditions is inadequate temperature and air circulation, which can cause fatigue and performance decline among medical personnel (Wolkoff, Azuma, & Carrer, 2021). Additionally, high noise levels from medical equipment can elevate stress levels and hinder effective communication among medical staff, risking a reduction in the quality of patient care (Dierickx, Verschraegen, Wierinck, Willems, & Wieringen, 2021).

Inappropriate lighting, whether too dim or excessively bright, can also negatively impact eye health and reduce working comfort (Hoshi, Iwasa, Goto, & Yasumura, 2022). Therefore, managing physical aspects in the healthcare work environment requires serious attention to ensure optimal conditions for their well-being. Beyond physical factors, ergonomic aspects pose a major challenge in the healthcare work environment. Non-ergonomic workspaces can increase the risk of musculoskeletal disorders, particularly for medical personnel who frequently engage in strenuous physical activities such as lifting patients or working in static positions for extended periods (Cruz-Ausejo et al., 2023). Unmanaged musculoskeletal disorders can lead to chronic pain, ultimately resulting

in reduced work effectiveness and increased absenteeism among medical staff. Furthermore, poor workplace hygiene contributes to a higher risk of nosocomial infections, endangering not only healthcare workers but also the patients in their care.

Nosocomial infections remain one of the primary threats in healthcare facilities; thus, a strict hygiene management system that adheres to standard protocols is required to minimize such risks. Exposure to radiation and hazardous chemicals in the medical environment also poses additional risk factors that can jeopardize healthcare workers' long-term health (Mahesh, Armin, & Mettler, 2022). Radiation from diagnostic equipment, such as X-rays and radioactive materials, can increase the risk of genetic mutations and various chronic diseases if medical personnel are not equipped with adequate protection. Similarly, exposure to hazardous chemicals, such as disinfectants and certain pharmaceuticals, can cause allergic reactions to respiratory system disorders if not handled properly. Therefore, the implementation of strict workplace safety protocols, the proper use of personal protective equipment (PPE), and effective medical waste management are essential to protect healthcare personnel from occupational hazards. By creating a safe and comfortable working environment, the well-being of medical staff can be better preserved, enabling them to deliver optimal healthcare services to the public.

Occupational Health and Safety (OHS) Related Factors

Workplace safety is a crucial aspect of the medical field because healthcare personnel face high risks from various occupational hazards. A lack of Personal Protective Equipment (PPE) availability is a major factor increasing the risk of exposure to infectious diseases and hazardous materials, particularly when treating patients with infectious illnesses (Aengst et al., 2022). Inadequate PPE usage not only endangers medical personnel but can also heighten the risk of disease transmission to other patients. Furthermore, non-compliance with occupational safety standards can increase the likelihood of workplace accidents, such as needle-stick injuries or exposure to hazardous chemicals, which potentially compromise the safety of healthcare workers (Magalhães, Costa, Capistrano, Leal, & Andrade, 2022). Consequently, adequate PPE availability and strict enforcement of safety standards are essential to protect medical personnel from hazardous occupational risks. Inadequate safety training also constitutes a significant risk factor for healthcare workers' safety. A limited understanding of safety procedures can increase the probability of workplace incidents, especially in emergency situations such as fires or hazardous chemical spills. Unclear emergency procedures and a lack of routine simulations slow medical personnel's response time during critical situations, thereby endangering both their safety and that of the patients under their care (Los, Hulshof, Boer, & Molen, 2023). Moreover, healthcare staff who do not receive adequate safety training are more prone to errors when operating medical equipment or handling hazardous materials. Therefore, conducting regular safety training and providing clear emergency procedure guidelines represent vital steps toward improving occupational safety for medical personnel in healthcare facilities.

Ergonomic factors in medical work also require special attention to reduce the risk of injuries resulting from non-ergonomic working postures. Medical personnel frequently work in uncomfortable positions, such as bending over for extended periods or lifting patients, which elevates the risk of musculoskeletal disorders (Muthukrishnan & Ahmad, 2021). The use of medical equipment that is not ergonomically designed can further exacerbate these conditions, causing physical exhaustion and reduced productivity among healthcare workers. Additionally, errors in procedures involving hazardous substances, such as cytotoxic drugs or chemical disinfectants, can increase the risk of workplace accidents and endanger healthcare staff's health (Hutchinson, Li, Cantrell, Schenkman, & Alemzadeh, 2022). Therefore, implementing ergonomic principles in workspace and equipment design, alongside offering training on handling hazardous materials, serves as a crucial step in creating a safe and comfortable work environment for healthcare professionals.

RESEARCH METHODS

This study adopts a quantitative approach using a survey method via structured questionnaires distributed to professional healthcare personnel in Indonesia (Rashid et al., 2021). This approach was selected to obtain objective and systematic data regarding the factors influencing healthcare workers' work balance, including work environment aspects, institutional policies, as well as social and economic factors affecting job stress (Fazal, Masood, Nazir, & Majoka, 2022). The analytical technique employed in this research is factor analysis utilizing the MICMAC (*Matrix of Cross Impact Multiplications Applied to Classification*) method to determine the key factors most significantly impacting healthcare workers' work balance (Hamdi & Toumi, 2024). MICMAC is used

to identify relationships among variables within complex systems, as well as to determine factors with direct and indirect impacts on the work balance of medical personnel. In addition, descriptive analysis was conducted to map the primary trends among respondents, alongside reliability and validity testing using Cronbach's Alpha and content validation by healthcare experts (Amirrudin, Nasution, & Supahar, 2021). Through this methodology, the study is expected to yield accurate, data-driven results, serving as a foundation for policy recommendations for healthcare institutions to enhance healthcare workers' work balance (Sholihah, Novareza, Wibowo, & Setyanto, 2023).

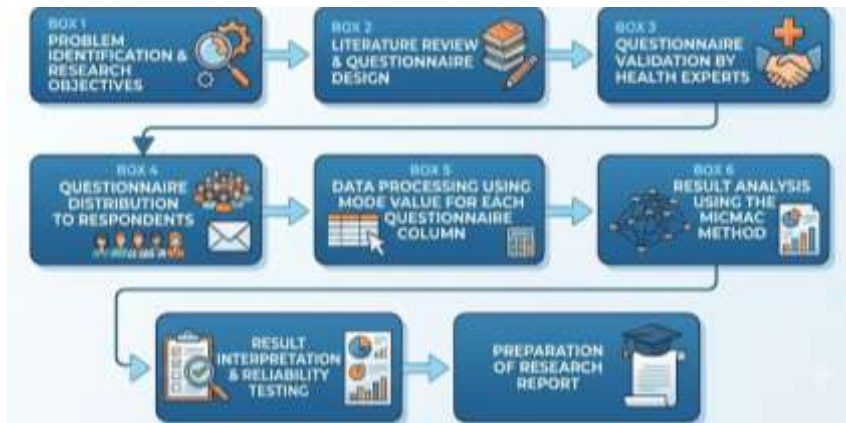


Fig 1. Sequential diagram of the reseach process

RESULTS AND DISCUSSION

Key Factors with the Highest Influence

Surges in patient volume directly affect various aspects of the healthcare work environment, including increased workloads, a higher risk of procedural errors, elevated stress levels, and compromised resource management effectiveness (Shah, Gandrakota, & Cimiotti, 2021). This escalating pressure impacts the work balance of healthcare personnel, both physically and mentally, which ultimately influences the quality of healthcare delivery. Meanwhile, limited access to healthcare facilities also presents a major challenge for medical staff, particularly in remote areas or regions with inadequate infrastructure (Coombs, Meriwether, Caringi, & Newcomer, 2021). This situation not only restricts the efficiency of healthcare workers in providing optimal care but also heightens the potential for job dissatisfaction due to obstacles encountered in executing their duties effectively.

Table 1. MIIP matrix.

Nº	VARIABLE	TOTAL NUMBER OF ROWS	TOTAL NUMBER OF COLUMNS
1	Poor temperature/circulation	4042	3633
2	Workload	4668	4346
3	Stress Management Training	4452	4935
4	Coworker conflict	3193	5046
5	Hazardous materials procedure error	4748	4025
6	Working more than one job	3553	4700
7	Limited access to health facilities	4084	3506
8	Surge of patients	4911	3196
9	Sudden loss of staff	4016	3484
10	Management/communication failure	2200	2996
	Totals	158	158

Key Factors with the Lowest Influence

Poor temperature and air circulation can affect the working comfort of healthcare personnel, particularly in environments requiring high concentration and rapid mobility (Wolkoff, Azuma, & Carrer, 2021). Although its impact is primarily physical and ergonomic, this factor does not directly relate to stress management or social dynamics in the workplace. Nevertheless, an uncomfortable working environment can still diminish healthcare workers' productivity and long-term well-being. On the other hand, a sudden loss of staff has a more pronounced impact on specific situations, such as during critical procedures or emergency responses (Palejwala et al., 2023). While this factor occurs less frequently than other challenges, its effect can be highly significant, particularly in increasing the workload for the remaining team members. Such impacts are often localized within specific timeframes or affect only certain segments of the medical staff, yet they still require appropriate management strategies to minimize disruptions in health services.

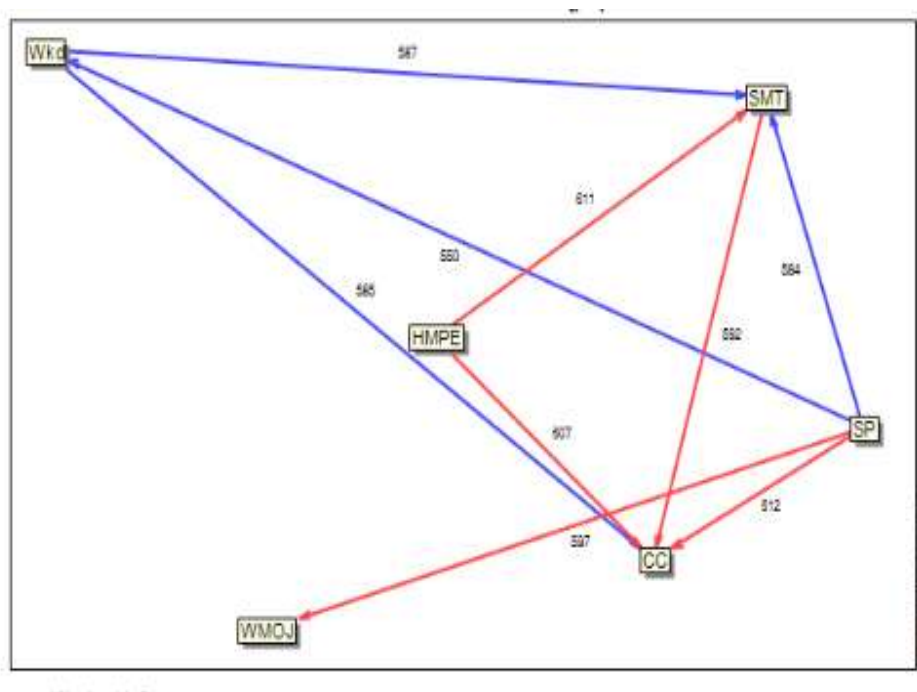


Fig 2. Potential indirect graph

Based on the MICMAC matrix analysis, the relationships between various factors can be categorized according to their level of interconnection and influence (Sillehu et al., 2025). Some factors may have no direct interconnection, which is categorized as no relationship (0). An example is poor temperature or air circulation, which does not directly relate to stress management training. Although both factors can affect working comfort, their impacts are not significantly interconnected regarding stress management for medical personnel. Furthermore, there are weak relationships (1), which occur when interconnections between certain factors exist, but their influence is not significant. An example is the relationship between holding multiple jobs and limited access to healthcare facilities. Although these two factors can contribute to job pressure among medical staff, their interconnection is not particularly strong because access to health facilities is more closely tied to infrastructure and policy, whereas taking on additional jobs has a more direct impact on the individual.

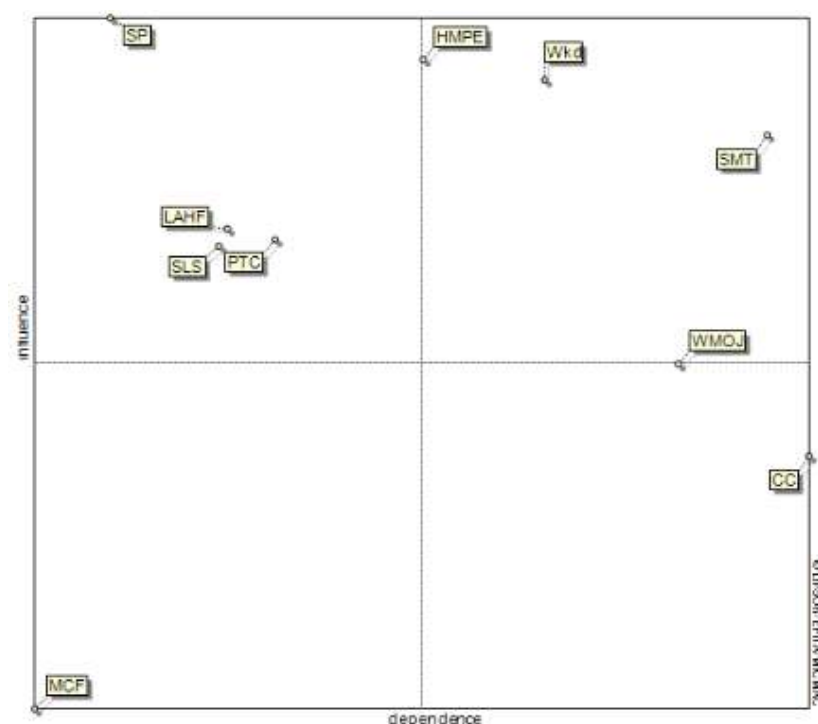


Fig 3. Potential dependence Map

Based on the analysis of the collected questionnaires, it was found that patient surges have the greatest influence on the work balance of medical personnel. A surge in patient numbers directly increases workload, the risk of procedural errors, stress levels, and affects resource management effectiveness (Shah, Gandrakota, & Cimiotti, 2021). Patient surges lead to an increased risk of burnout and a decline in the quality of healthcare delivery (Verduzco-Gutierrez et al., 2020). Therefore, more effective resource allocation strategies are required to mitigate the negative impacts of high workloads. In addition, limited access to healthcare facilities is also a highly influential factor affecting healthcare workers' work balance. This limitation hinders the ability of medical staff to provide optimal care, particularly in remote areas. Restricted access to health facilities elevates stress levels among medical personnel and reduces patient care quality (Coombs, Meriwether, Caring, & Newcomer, 2021). Thus, improving health infrastructure serves as one of the primary solutions to address this issue. Conversely, poor temperature or air circulation has the lowest influence on healthcare workers' work balance (Wolkoff, Azuma, & Carrer, 2021). This factor affects working comfort rather than direct productivity. While an uncomfortable work environment can reduce comfort, its impact on work efficiency remains limited (Imamura et al., 2021). Therefore, although this aspect requires attention, its improvement is not a top priority compared to other more significant factors. Another factor with a low influence is sudden staff loss. Although it can increase the workload for the remaining medical personnel, this event occurs less frequently than other systemic factors. Sudden staff loss can disrupt hospital operations, but its impact can be minimized through better human resource management planning (Palejwala et al., 2023). Consequently, policies regarding flexible shift rotation systems can serve as a key measure to mitigate the impact of this factor..

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