

Factors affecting with the implementation of the occupational health and safety management system at Tuan Besar Syarif Idrus Regional General Hospital, Kubu Raya regency, West Kalimantan province

Hardiansyah¹, Triana Srisantyorini², Abul A'la Al Maududi³, Pitut Aprilia Savitri⁴

^{1,2,3,4}Master of Public Health, Faculty of Public Health, Universitas Muhammadiyah Jakarta, Tangerang Selatan, Indonesia

ARTICLE INFO

Article history:

Received Sep 23, 2026

Revised Oct 3, 2026

Accepted Oct 12, 2026

Keywords:

Hospital
Management Commitment
Occupational Safety and Health
Management System
Safety Facilities
Work Environment

ABSTRACT

Occupational Safety and Health Management System (SMK3) is essential to protect hospital workers and support safe and quality healthcare services. However, its implementation may vary according to organizational and operational conditions, while evidence regarding the factors associated with SMK3 implementation at the regional hospital level remains limited. This study aimed to analyze the factors associated with SMK3 implementation at Tuan Besar Syarif Idrus Regional General Hospital, Kubu Raya Regency, West Kalimantan. An analytical quantitative study with a cross-sectional design was conducted among 180 employees. From a total workforce of 210 employees, 30 non-healthcare employees were allocated for instrument validity and reliability testing. A total of 140 respondents were selected using proportionate stratified random sampling. Data were collected using a structured questionnaire and analyzed using Spearman rank correlation and multiple linear regression with a significance level of 0.05. The results showed significant positive associations between SMK3 implementation and OHS policy ($r = 0.408$), management commitment ($r = 0.505$), human resource competence ($r = 0.377$), facilities and infrastructure ($r = 0.659$), and work environment ($r = 0.306$), with all $p < 0.001$. The multivariable regression model was significant ($F = 34.721$; $p < 0.001$) and explained 56.4% of the variance in SMK3 implementation ($R^2 = 0.564$). Facilities and infrastructure were the only significant independent predictor ($\beta = 0.562$; $p < 0.001$). These findings indicate that strengthening the availability, adequacy, accessibility, and maintenance of safety facilities and infrastructure should be prioritized to improve SMK3 implementation, supported by effective policies, management commitment, competent human resources, and a safe work environment.

This is an open access article under the [CC BY-NC](#) license.



Corresponding Author:

Hardiansyah,
Master of Public Health,
Universitas Muhammadiyah Jakarta,
Jl. K.H. Ahmad Dahlan, Cireundeu, Kec. Ciputat Timur, Kota Tangerang Selatan, Banten, 15419, Indonesia

Email: ardiahmad941@gmail.com

INTRODUCTION

Hospitals are complex healthcare organizations that operate continuously and involve healthcare and non-healthcare workers in clinical, administrative, technical, and support activities. These characteristics create a dynamic occupational environment in which workers may be exposed to biological, chemical, physical, ergonomic, and psychosocial hazards. Occupational safety and health (OSH) management is therefore an essential component of hospital management, not only to protect workers from occupational injuries and diseases but also to support the continuity, quality, and safety of healthcare services (Pramusiwi et al., 2024). Recent evidence indicates that safety management in healthcare requires a systematic approach integrating organizational policy, leadership, risk management, safety resources, teamwork, and safety culture (Althobaiti, 2026).

The implementation of an Occupational Safety and Health Management System (SMK3) provides a systematic framework for managing occupational risks through policy development, hazard identification, risk assessment and control, implementation of OSH programs, monitoring, evaluation, and continual improvement. In Indonesia, the general framework for SMK3 is established through Government Regulation on Health and Safety Procedures No. of 50, 2012 concerning the implementation of occupational safety and health management systems. Occupational safety and health in hospitals is further regulated through Minister of Health Regulation No. of 66, 2016 concerning Occupational Safety and Health in Hospitals. These regulations provide the institutional and operational basis for integrating OSH management into hospital management processes (Government of the Republic of Indonesia, 2012; Ministry of Health of the Republic of Indonesia, 2016).

Empirical evidence from Indonesian hospitals indicates that SMK3 implementation is influenced by organizational and operational conditions. A study in hospitals in Banda Aceh found that the implementation of OHS policies, planning, and implementation activities was associated with broader SMK3 implementation (Harum, 2024). Similarly, research at Cileungsi Hospital indicated that management commitment was reflected in policies and programs, although implementation was still challenged by limitations in socialization, training, and evaluation (Darmastuti, 2024). Research at Tanjungpura University Hospital in Pontianak also demonstrated the importance of systematic planning and implementation of occupational safety measures, including the provision of personal protective equipment and other protective measures for healthcare workers (Pratiwi et al., 2022). In addition, a recent study at Pekanbaru Hospital described hospital OSH management as an interconnected process involving policy, planning, implementation, monitoring, and evaluation (Rahayu, et al., 2025). These findings suggest that SMK3 implementation should be understood as an organizational process involving multiple interrelated components rather than as an isolated occupational safety activity.

Management commitment is an important organizational component in establishing and sustaining effective OSH management. It may be demonstrated through the prioritization of safety, allocation of resources, supervision, communication of safety expectations, employee participation, and support for safety program implementation and evaluation. Evidence from Indonesian hospitals suggests that management commitment provides an important foundation for SMK3 implementation, but formal commitment needs to be translated into concrete programs, training, supervision, and evaluation (Hayat & Kurniatillah, 2023). International evidence similarly indicates that hospital safety culture interventions are associated with leadership, teamwork, institutional support, and organizational learning, emphasizing the role of management in creating conditions that support safer work practices (Finn et al., 2024). Thus, management commitment represents an important mechanism through which formal OSH policies can be translated into operational practices.

Human resource competence is another important component of SMK3 implementation. Hospital workers require adequate knowledge, skills, and awareness to identify occupational hazards, comply with safety procedures, use personal protective equipment appropriately, and respond to emergency situations. Competence is particularly relevant because the effectiveness of an OSH management system depends on workers' ability to translate organizational policies and procedures into safe practices (Vovo et al., 2024). A systematic review found evidence of a positive relationship between healthcare worker competence and safety culture, emphasizing the importance of competency development in supporting safe healthcare practices (Zaitoun et al., 2023). Consequently, effective SMK3 implementation requires not only formal organizational policies but also workers who possess the competence necessary to apply those policies in daily activities.

Facilities and infrastructure constitute an important operational component of hospital occupational safety. The availability, adequacy, accessibility, and suitability of safety resources are necessary to support the implementation of OSH procedures. Depending on the hazards present, hospital workers may require personal protective equipment, fire protection equipment, emergency facilities, safety signage, sanitation facilities, waste-management infrastructure, and other appropriate safety resources (Pramusiwi et al., 2024). Evidence from healthcare safety research identifies safety resources as one of the organizational dimensions associated with safety performance, alongside leadership, risk management, communication, safety procedures, and healthcare worker involvement (Noor Arzahan et al., 2022). Recent evidence on safety management systems in healthcare also emphasizes the importance of safety assurance and organizational resources in translating formal safety requirements into practical safety measures (Zhelev et al., 2025). Indonesian studies further indicate that adequate resources and systematic implementation remain important elements of hospital OSH management (Fitriani et al., 2023; Siregar, 2026).

The work environment also represents an important component of occupational safety in healthcare organizations. A supportive work environment can facilitate communication, teamwork, adherence to safety procedures, identification of hazards, and reporting of unsafe conditions. Conversely, unfavorable working conditions may create additional barriers to safe work practices and worker well-being. Evidence from hospital settings has demonstrated associations between work environment and safety-related outcomes (Brubakk & al., 2021). In addition, occupational exposure remains an important concern among healthcare workers, reinforcing the need for workplace conditions that support effective hazard prevention and control (Mengistu et al., 2022). The need for an integrated approach is further supported by evidence concerning safety management systems in healthcare. Zhelev et al., (2025) identified several interconnected components of healthcare safety management, including leadership and safety policy, safety risk management, safety assurance, and safety promotion and culture. Similarly, systematic reviews of healthcare safety culture have highlighted leadership, safety resources, risk management, communication, safety rules and procedures, and worker involvement as important dimensions of safety performance (Noor Arzahan et al., 2022). These findings are relevant to SMK3 because OHS policy, management commitment, human resource competence, facilities and infrastructure, and work environment may operate together rather than as isolated determinants. RSUD Tuan Besar Syarif Idrus is a regional public hospital in Kubu Raya Regency, West Kalimantan, involving healthcare and non-healthcare workers in diverse service and support activities. The implementation of occupational safety and health management in this setting requires the integration of organizational policies, management commitment, worker competence, adequate facilities and infrastructure, and a supportive work environment.

Based on an initial survey involving interviews with the hospital's OSH management personnel and field observations, the OSH program had been established and implemented in accordance with applicable regulations. Overall, the hospital's OSH facilities were considered

adequate, including the availability of fire extinguishers, a fire alarm system, evacuation routes, and medical hazardous and toxic waste management facilities. The hospital had also conducted emergency response training for fire and natural disaster situations, while compliance with the use of personal protective equipment (PPE) was generally reported to be good. However, the initial survey indicated that several aspects of OSH implementation still required strengthening, particularly the consistency of OSH procedure implementation, the incident reporting system, operational resource and budgetary support, and the development of a consistent safety culture across service units. Although PPE compliance was generally good, its implementation was sometimes constrained by limited operational support related to budgetary limitations. In addition, reports of needlestick injuries and musculoskeletal complaints related to work activities, workload, and shift patterns were still identified during the initial assessment. These findings do not indicate an absence of OSH programs or facilities; rather, they suggest that the availability of programs and safety infrastructure needs to be accompanied by consistent implementation, adequate operational support, effective incident reporting, and continuous risk control at the operational level.

Although previous studies have examined various aspects of occupational safety and SMK3 implementation, much of the available evidence has focused on specific organizational dimensions or on overall evaluations of SMK3. Recent Indonesian studies have investigated SMK3 implementation in hospitals in Banda Aceh, Cileungsi, Pontianak, and Pekanbaru (Darmastuti, 2024; Pratiwi et al., 2022; Rahayu et al., 2025; Sanusi et al., 2024). However, evidence concerning the simultaneous association of OHS policy, management commitment, human resource competence, facilities and infrastructure, and work environment with SMK3 implementation remains limited, particularly in regional hospitals in West Kalimantan. Previous studies have generally examined particular organizational dimensions, described specific aspects of SMK3 implementation, or evaluated hospital OSH management more broadly. In contrast, this study examines five organizational and operational factors simultaneously and assesses their associations with SMK3 implementation using both bivariate and multivariable analyses. This approach provides an opportunity to identify not only factors that are individually associated with SMK3 implementation but also the factor that remains most strongly associated when the other factors are considered simultaneously.

The need for this study is further supported by the initial conditions identified at RSUD Tuan Besar Syarif Idrus. Although the hospital has established OSH programs, provided generally adequate safety facilities, and conducted relevant emergency response training, the initial survey identified challenges related to procedural consistency, incident reporting, operational resource and budgetary support, safety culture, and the occurrence of reported needlestick injuries and musculoskeletal complaints. Therefore, empirical evidence is needed to determine which organizational and operational factors are most strongly associated with SMK3 implementation and to provide a basis for prioritizing improvement efforts. Such evidence is particularly important for a regional hospital because local organizational conditions, available resources, and operational characteristics may differ from those of larger referral hospitals.

Accordingly, the research gap addressed by this study is the limited empirical evidence on the simultaneous association of OHS policy, management commitment, human resource competence, facilities and infrastructure, and work environment with SMK3 implementation in regional hospitals, particularly in West Kalimantan. By examining these factors concurrently, this study seeks to provide a more comprehensive understanding of the organizational and operational conditions associated with SMK3 implementation and to identify the factor that has the strongest association after adjustment for the other factors. Therefore, this study aimed to analyze the associations between OHS policy, management commitment, human resource competence, facilities and infrastructure, and work environment with the implementation of SMK3 at RSUD Tuan Besar Syarif Idrus, Kubu Raya Regency, West Kalimantan.

RESEARCH METHOD

This study used an analytical quantitative design with a cross-sectional approach to examine factors associated with the implementation of the Occupational Safety and Health Management System (SMK3) at Tuan Besar Syarif Idrus Regional General Hospital, Kubu Raya Regency, West Kalimantan. Data were collected in June 2026 using a structured questionnaire administered to healthcare and nonhealthcare employees (Sugiono,2023).

The total workforce of the hospital was 210 employees, consisting of healthcare and non-healthcare workers. Before the main data collection, 30 non-healthcare employees were selected to participate in validity and reliability testing of the research instrument. These employees were excluded from the main study population to avoid duplication between the instrument testing and the primary data collection. Therefore, the accessible study population consisted of 180 employees. The sample size was determined using the Slovin formula with a 5% margin of error. An additional 10% allowance was incorporated to anticipate potential non-response or incomplete data. Based on these considerations, 140 respondents were selected as the final study sample using proportionate stratified random sampling.

The questionnaire measured five independent variables: OHS policy, management commitment, human resource competence, facilities and infrastructure, and work environment. SMK3 implementation was treated as the dependent variable. All variables were measured using a five-point Likert scale. The questionnaire underwent validity and reliability testing before being administered to the main study population.

Descriptive statistics were used to describe the distribution of the study variables. Spearman rank correlation was used to examine the bivariate associations between each independent variable and SMK3 implementation. Multiple linear regression was subsequently performed to assess the simultaneous relationship of the independent variables with SMK3 implementation and to identify the strongest independent predictor. Statistical significance was determined at $p < 0.05$. Ethical principles, including informed consent, confidentiality, voluntary participation, and protection of respondents' privacy, were applied throughout the study.

RESULTS AND DISCUSSIONS

Characteristics of Study Variables

Descriptive analysis was performed to describe the distribution of the study variables. The mean scores for OHS policy, management commitment, human resource competence, facilities and infrastructure, and work environment were 21.73, 42.02, 36.34, 21.34, and 32.81, respectively. These findings indicate relatively favorable conditions across the organizational and occupational safety dimensions assessed in the study. The mean score for OSHMS implementation was not included because the corresponding statistical output was unavailable in the dataset provided.

Table 1. Descriptive statistics of study variables

Variable	Mean
OHS Policy	21.73
Management Commitment	42.02
Human Resource Competence	36.34
Facilities and Infrastructure	21.34
Work Environment	32.81
OSHMS Implementation	<i>See original statistical output</i>

Bivariate Analysis

Spearman's rank correlation analysis was performed to examine the relationships between the independent variables and OSHMS implementation. All five independent variables showed statistically significant positive correlations with OSHMS implementation ($p < 0.001$). OHS policy showed a moderate positive correlation with OSHMS implementation ($r = 0.408$, $p < 0.001$).

Management commitment also demonstrated a moderate positive correlation ($r = 0.505, p < 0.001$). Human resource competence was positively correlated with OSHMS implementation, with a low-to-moderate correlation ($r = 0.377, p < 0.001$). The strongest bivariate correlation was observed between facilities and infrastructure and OSHMS implementation ($r = 0.659, p < 0.001$). Work environment also demonstrated a significant positive correlation, although the magnitude was low-to-moderate ($r = 0.306, p < 0.001$).

Table 2. Correlations between independent variables and OSHMS implementation

Independent variable	Spearman's r	p -value	Interpretation
OHS Policy	0.408	<0.001	Significant, moderate
Management Commitment	0.505	<0.001	Significant, moderate
Human Resource Competence	0.377	<0.001	Significant, low-moderate
Facilities and Infrastructure	0.659	<0.001	Significant, strong
Work Environment	0.306	<0.001	Significant, low-moderate

OHS policy was positively and significantly associated with OSHMS implementation ($r = 0.408, p < 0.001$). Management commitment also demonstrated a significant positive association ($r = 0.505, p < 0.001$). Similarly, human resource competence was significantly and positively associated with OSHMS implementation ($r = 0.377, p < 0.001$). The strongest bivariate association was observed for facilities and infrastructure, with $r = 0.659$ ($p < 0.001$). Work environment also demonstrated a significant positive association with OSHMS implementation ($r = 0.306, p < 0.001$). Overall, the bivariate analysis indicates that all five independent variables were significantly associated with OSHMS implementation.

Multiple Linear Regression

Multiple linear regression was conducted to examine the simultaneous association between the five independent variables and OSHMS implementation. The regression model demonstrated a correlation coefficient (R) of 0.751, an R^2 of 0.564, and an adjusted R^2 of 0.548, with a standard error of estimate of 2.785. Thus, the variables included in the model collectively explained 56.4% of the variation in OSHMS implementation, while 54.8% remained explained after adjustment for the number of predictors. The overall regression model was statistically significant ($F = 34.721, p < 0.001$).

Table 3. Multiple linear regression model summary

R	R^2	Adjusted R^2	Standard Error of Estimate
0.751	0.564	0.548	2.785

Table 4. Simultaneous test of regression model

Model	df	F	p -value
Regression	5	34.721	<0.001
Residual	134		
Total	139		

Partial Regression Analysis

The partial regression analysis assessed the independent statistical contribution of each predictor after controlling for the other variables in the model. OHS policy ($\beta = 0.093, p = 0.208$), management commitment ($\beta = 0.112, p = 0.189$), human resource competence ($\beta = 0.088, p = 0.240$), and work environment ($\beta = 0.035, p = 0.606$) were not statistically significant in the adjusted model. In contrast, facilities and infrastructure demonstrated a statistically significant positive association with OSHMS implementation ($B = 1.040, \beta = 0.562, t = 7.238, p < 0.001$). Among the predictors included in the model, facilities and infrastructure had the largest standardized coefficient.

Table 5. Partial regression coefficients

Variable	B	Standardized β	<i>t</i>	<i>p</i> -value
Constant	7.089	—	2.477	0.015
OHS Policy	0.178	0.093	1.265	0.208
Management Commitment	0.104	0.112	1.320	0.189
Human Resource Competence	0.089	0.088	1.181	0.240
Facilities and Infrastructure	1.040	0.562	7.238	<0.001
Work Environment	0.025	0.035	0.516	0.606

The regression equation was:

$$Y = 7.089 + 0.178 X^1 + 0.104 X^2 + 0.089 X^3 + 1.040 X^4 + 0.025 X^5$$

where Y represents SMK3 implementation; X_1 represents OHS policy; X_2 represents management commitment; X_3 represents human resource competence; X_4 represents facilities and infrastructure; and X_5 represents work environment.

Discussion

The present study found that OHS policy, management commitment, human resource competence, facilities and infrastructure, and work environment were all positively and significantly associated with OSHMS implementation in the bivariate analysis. These findings indicate that OSHMS implementation in hospitals involves multiple interconnected organizational, managerial, human, physical, and environmental factors. This is consistent with previous evidence showing that hospital safety management requires an integrated approach involving leadership, safety policy, risk management, safety resources, worker participation, teamwork, and continuous improvement (Finn et al., 2024; Zhelev et al., 2025). Studies in Indonesian hospitals have similarly identified policy, commitment, risk management, staff competence, implementation, monitoring, and evaluation as important components of hospital OSHMS (Sukwika et al., 2023; Sanusi et al., 2024).

OHS policy showed a moderate positive correlation with OSHMS implementation ($r = 0.408$, $p < 0.001$). This finding indicates that better perceptions of OHS policy were associated with better OSHMS implementation. An OHS policy provides direction for safety priorities, responsibilities, and organizational commitments and serves as a basis for implementing occupational safety programs. This finding is consistent with Sanusi et al., (2024), who reported an association between organizational factors, including OHS policy, and hospital SMK3 implementation. Diaz et al., (2024) also emphasized that hospital OSHMS involves interconnected processes of policy, planning, implementation, monitoring, and evaluation. Harefa et al. (2024) reported similar findings, showing that weaknesses in the policy component were accompanied by incomplete implementation of OSHMS requirements.

However, OHS policy was not statistically significant in the multivariable model ($\beta = 0.093$, $p=0.208$). This difference suggests that the relationship between policy and OSHMS implementation may overlap with other variables in the model. A formal policy may not be sufficient when it is not supported by adequate resources, supervision, worker participation, and evaluation. Kartika et al., (2024) similarly reported that hospital OHSMS implementation may still experience weaknesses in the distribution of responsibilities and evaluation mechanisms despite the existence of OHS policies. Thus, policy implementation needs to be translated into consistent operational practices.

Management commitment was also positively and significantly associated with OSHMS implementation, with a moderate correlation ($r = 0.505$, $p < 0.001$). Management commitment may be reflected through resource allocation, supervision, communication, training, worker participation, and support for monitoring and evaluation. Darmastuti, (2024) reported that management commitment in a hospital was demonstrated through guidelines, work programs, and reporting, although limitations remained in training, socialization, and evaluation. Similarly, Rahmadani et al., (2023) identified commitment as an important component of hospital OHSMS.

International evidence also indicates that leadership and management support are important elements in efforts to improve safety culture in hospitals (Finn et al., 2024; Hesgrove et al., 2024).

In the multivariable analysis, management commitment was not statistically significant ($\beta = 0.112$, $p = 0.189$). This result suggests that its independent statistical contribution was reduced after other variables were considered simultaneously. Management commitment may be closely related to the provision of safety resources, policy implementation, supervision, and worker competency development. Therefore, management commitment may be more effectively reflected through tangible organizational support for OSHMS implementation (Zahid Faqir, 2024).

Human resource competence demonstrated a significant positive correlation with OSHMS implementation ($r = 0.377$, $p < 0.001$). Competent workers are expected to have greater capacity to identify hazards, understand safety procedures, use PPE appropriately, and participate in risk-control activities. Rahmadani and Modjo (2021) identified staff skills and capabilities as important elements of hospital OHSMS, while Zaitoun et al., (2023) highlighted the relationship between healthcare worker competence and safety culture. Lin et al., (2022) also found that safety climate was associated with nurses' safety behavior, including practices related to PPE use.

Despite this significant bivariate relationship, human resource competence was not statistically significant in the multivariable model ($\beta = 0.088$, $p = 0.240$). This finding indicates that the statistical contribution of competence may overlap with organizational and physical factors. Individual knowledge and skills may not be sufficient when workers lack adequate resources, supervision, or organizational support. Thus, worker competence should be considered as one component of a broader OSHMS rather than as an isolated factor (Noor Arzahan et al., 2022; Zhelev et al., 2025).

Facilities and infrastructure demonstrated the strongest bivariate correlation with OSHMS implementation ($r = 0.659$, $p < 0.001$) and remained statistically significant in the multivariable analysis ($B = 1.040$, $\beta = 0.562$, $p < 0.001$). The standardized coefficient was the largest among the predictors, indicating the largest independent statistical contribution within the model. This finding highlights the importance of tangible resources in supporting the implementation of occupational safety procedures. Depending on the risks present, such resources may include PPE, emergency facilities, fire protection systems, safety signage, sanitation facilities, waste-management infrastructure, and safe medical equipment.

The importance of safety resources is supported by Noor Arzahan et al., (2022), who identified safety resources, leadership, risk management, communication, safety procedures, and worker involvement as important dimensions of safety performance in healthcare facilities. Lin et al., (2022) also demonstrated the relevance of PPE accessibility and usability to safe work practices. In Indonesia, Pratiwi et al., (2022) reported the implementation of several occupational protection measures, including PPE provision and environmental controls, at Tanjungpura University Hospital. Kartika et al., (2024) further emphasized that effective OSHMS implementation requires adequate operational support in addition to formal policies.

The findings therefore indicate that facilities and infrastructure represent an important operational component of OSHMS implementation. Their significance in the multivariable model suggests that tangible safety resources made an important independent statistical contribution within the study population. Nevertheless, because this study used a cross-sectional design, the finding should be interpreted as an association and not as evidence of a causal effect (Lestari & Nasrifah, 2024).

Work environment also showed a significant positive correlation with OSHMS implementation ($r=0.306$, $p<0.001$). A supportive work environment may facilitate communication, teamwork, hazard identification, safety reporting, and adherence to safety procedures. Zhao & Yin, (2023) reported an association between safety climate and safety performance among hospital workers, while Gutierrez Fernandez et al., (2024) highlighted the importance of teamwork and other work-environment characteristics. Zabin et al., (2023) also found relationships between job stress and safety culture among nurses.

However, work environment was not statistically significant in the multivariable model ($\beta = 0.035$, $p = 0.606$). This suggests that its bivariate relationship with OSHMS implementation may overlap with other factors, including management practices, worker competence, and safety facilities. Hesgrove et al., (2024) demonstrated that workplace safety culture is closely related to patient safety culture and perceptions of leadership support. Therefore, the work environment may function as part of the broader organizational context supporting OSHMS implementation.

The multiple regression model was statistically significant ($F = 34.721$, $p < 0.001$) and explained 56.4% of the variance in OSHMS implementation, with an adjusted R^2 of 54.8%. This indicates that the five variables collectively provided substantial explanatory value for OSHMS implementation in the study population. However, 43.6% of the variance remained unexplained by the variables included in the model. Other factors, such as safety culture, safety leadership, communication, incident reporting, organizational learning, worker participation, supervision, workload, psychological safety, and safety assurance, may also be relevant (Tsopa et al., 2024).

The difference between the bivariate and multivariable findings is important for interpretation. Each variable was significantly associated with OSHMS implementation when examined individually, whereas only facilities and infrastructure remained statistically significant after simultaneous adjustment. This does not indicate that OHS policy, management commitment, human resource competence, and work environment are irrelevant. Rather, their independent statistical contributions were reduced after the other variables were taken into account. The pattern may reflect the interconnected nature of hospital safety management, in which policy, management, human resources, physical resources, and workplace conditions interact with one another (Sukwika Tatan & Prinajati, 2023).

From a practical perspective, the findings emphasize the importance of ensuring that occupational safety facilities and infrastructure are available, adequate, accessible, appropriate to identified risks, and properly maintained. However, physical resources should be accompanied by consistent policy implementation, management support, worker competency development, supervision, worker participation, and regular monitoring and evaluation. This integrated approach is consistent with contemporary healthcare safety management frameworks and the Indonesian regulatory framework for occupational safety and health management in workplaces and hospitals (Sanusi et al., 2024).

This study has several limitations. First, the cross-sectional design does not allow causal relationships to be established; therefore, the findings should be interpreted as statistical associations rather than causal effects. Second, the study was conducted in a single regional hospital, which limits the generalizability of the findings to other hospitals with different organizational and operational characteristics. Third, the primary quantitative measurements were based on respondents' assessments using a structured questionnaire, which may introduce response or perception bias. Although initial interviews with OSH management personnel and field observations were conducted to provide contextual information, these data were not used as the primary quantitative measurements. Future multicenter and longitudinal studies are recommended to confirm these findings and provide stronger evidence regarding the temporal and causal relationships between organizational factors and SMK3 implementation.

CONCLUSION

The study demonstrated that OHS policy, management commitment, human resource competence, facilities and infrastructure, and work environment were each positively and significantly associated with SMK3 implementation in the bivariate analysis. However, after adjustment for the other variables in the multiple regression model, only facilities and infrastructure remained significantly associated with SMK3 implementation, with the largest standardized coefficient ($\beta = 0.562$; $p < 0.001$). The five variables were jointly significantly associated with SMK3 implementation ($F = 34.721$; $p < 0.001$), and the model explained 56.4% of the variance in SMK3

implementation (adjusted $R^2 = 54.8\%$). These findings indicate that facilities and infrastructure were the strongest factor associated with SMK3 implementation among the variables examined in this study. Nevertheless, because this study employed a cross-sectional design, the findings indicate statistical associations and should not be interpreted as evidence of causal relationships. The temporal sequence between the independent variables and SMK3 implementation could not be established. Therefore, the findings should be interpreted within the context of RSUD Tuan Besar Syarif Idrus and not assumed to be directly generalizable to other hospitals with different organizational and operational characteristics.

ACKNOWLEDGEMENTS

The authors would like to express their sincere gratitude to the management of RSUD Tuan Besar Syarif Idrus, Kubu Raya Regency, West Kalimantan, for granting permission and providing support during the implementation of this study. The authors also extend their appreciation to the Occupational Safety and Health (OSH) team and all employees who participated as respondents and contributed their time and information to this research. The authors are grateful to all parties who provided assistance and support throughout the research process.

References

- Althobaiti, F. M. (2026). The effects of leadership on patient safety culture in health care: a systematic review. *BMC Nursing*, 25(1), 125. <https://doi.org/10.1186/S12912-025-04263-7>
- Brubakk, K., & al., et. (2021). Hospital work environments affect the patient safety climate. *PLOS ONE*. <https://doi.org/10.1371/journal.pone.0258471>
- Darmastuti. (2024). Analysis of Hospital Management's Commitment to the Implementation of the Occupational Safety and Health Management System at Cileungsi Hospital. *Media Publikasi Promosi Kesehatan Indonesia*, 7(7), 1827-1833. <https://doi.org/10.56338/mppki.v7i7.5020>
- Diaz, A. S., Rambey, H., & Tarigan, L. (2024). Evaluation of the implementation of SMK3 at the Grandmed Lubuk Pakam Hospital in 2024. *JURNAL KESMAS DAN GIZI (JKG)*, 7(1), 58-65. <https://doi.org/10.35451/JKG.V7I1.2322>
- Endang Purnawati Rahayu, Harnani, Y., & Makomulamin. (2025). Analisis Penerapan Sistem Manajemen Keselamatan Dan Kesehatan Kerja di Rumah Sakit Pekanbaru. *Jurnal Kesehatan Komunitas (Journal of Community Health)*, 11(2), 251-261. <https://doi.org/10.25311/KESKOM.VOL11.ISS2.2176>
- Finn, M., Walsh, A., Rafter, N., Mellon, L., Chong, H. Y., Naji, A., O'Brien, N., Williams, D. J., & McCarthy, S. E. (2024). Effect of interventions to improve safety culture on healthcare workers in hospital settings: a systematic review of the international literature. *BMJ Open Quality*, 13(2). <https://doi.org/10.1136/BMJQ-2023-002506>
- Fitriani, D., Sari, M., & Rahayu, N. (2023). Management Commitment and Safety Culture in Hospital Occupational Health Systems in Indonesia. *Journal of Hospital Administration*, 12(3), 45-56. <https://doi.org/10.5430/jha.v12n3p45>
- Gutiérrez Fernández, E., Amo-Setién, F., César, L. C., Concepción, S. S., Roberto, M. M., Jesús, M. M., & Carmen, O. M. (2024). Effectiveness of intervention programs aimed at improving the nursing work environment: A systematic review. *International Nursing Review*, 71(1), 148-159. <https://doi.org/10.1111/INR.12826;ISSUE:ISSUE:DOI>
- Harum, A. P. (2024). Evaluation of the Implementation of the Occupational Safety and Health Management System (SMK3) at Dr. H. Bob Bazar Hospital, Indonesia. *Golden Ratio of Data in Summary*, 5(1), 01-17. <https://doi.org/10.52970/grdis.v5i1.776>
- Hayat, F., & Kurniatillah, N. (2023). ANALISIS SISTEM MANAJEMEN KESELAMATAN DAN KESEHATAN KERJA DI RUMAH SAKIT: SEBUAH TINJAUAN LITERATUR. *Faletehan Jurnal Ekonomi Dan Bisnis*, 2(1), 16-25. <https://doi.org/10.61252/FJEB.V2I1.32>
- Hesgrove, B., Zebrak, K., Yount, N., Sorra, J., & Ginsberg, C. (2024a). Associations between patient safety culture and workplace safety culture in hospital settings. *BMC Health Services Research* 2024 24:1, 24(1), 568-. <https://doi.org/10.1186/S12913-024-10984-3>

- Kartika, F., Lestari, S., & Nasution, R. (2024). Assessing the implementation of occupational safety and health management system in the hospital. *Kartika & Nasution 244 Jurnal Prima Medika Sains*, 6(2), 244-250. <https://doi.org/10.34012/jpms.v6i2.6364>
- Lestari, H., & Nasrifah, L. (2024). Assessment of Occupational Health and Safety Management System Implementation in General Hospital. *Safety and Health for Medical Workers*, 1(2), 65-77. <https://doi.org/10.69725/SHMW.V1I2.117>
- Lin, Y. S., Gau, B. S., Chen, H. C., Liang, J. C., Shih, F. Y., Lin, Y. C., & Lou, M. F. (2022). The relationship between safety climate and nurses' safe handling of chemotherapy: A partial least squares structural equation modeling analysis. *European Journal of Oncology Nursing*, 61. <https://doi.org/10.1016/j.ejon.2022.102222>
- Mengistu, D. A., Dirirsa, G., Mati, E., Ayele, D. M., Bayu, K., Deriba, W., Alemu, F. K., Demmu, Y. M., Asefa, Y. A., & Geremew, A. (2022). Global Occupational Exposure to Blood and Body Fluids among Healthcare Workers: Systematic Review and Meta-Analysis. *Canadian Journal of Infectious Diseases and Medical Microbiology*, 2022(1), 5732046. <https://doi.org/10.1155/2022/5732046>
- Noor Arzahan, I. S., Ismail, Z., & Yasin, S. M. (2022). Safety culture, safety climate, and safety performance in healthcare facilities: A systematic review. *Safety Science*, 147, 105624. <https://doi.org/10.1016/J.SSCI.2021.105624>
- Peraturan Pemerintah No. 50. (2012). *Pelaksanaan Sistem Manajemen Keselamatan dan kesehatan kerja*. <https://peraturan.bpk.go.id/Details/5263/pp-no-50-tahun-2012>
- Permenkes No. 66. (2016). *K3 Rumah Sakit*. <https://peraturan.bpk.go.id/Details/114482/permenkes-no-66-tahun-2016>
- Pramusiwi, W. M., Hariyono, W., & Ruliyandari, R. (2024). Analysis of Occupational Safety and Health (OSH) Risks in Hospitals: Literature Review. *Media Publikasi Promosi Kesehatan Indonesia (MPPKI)*, 7(8), 2051-2061. <https://doi.org/10.56338/MPPKI.V7I8.5654>
- Pratiwi, R., Surono, A., & Qaimamunazalla, H. (2022). Analysis of occupational health and safety management systems implementation in serving COVID-19 patients at the Tanjungpura University Hospital, Pontianak. *Berita Kedokteran Masyarakat*, 38, 213-218. <https://doi.org/10.22146/BKM.V38I06.2044>
- Rahayu, E., Harnani, Y., & Makomulamin. (2025). Analisis Penerapan Sistem Manajemen Keselamatan Dan Kesehatan Kerja di Rumah Sakit Pekanbaru. *Jurnal Kesehatan Komunitas (Journal of Community Health)*, 11(2), 251-261. <https://doi.org/10.25311/keskom.vol11.iss2.2176>
- Rahmadani, E., Putra, M., & Santoso, A. (2023). Evaluasi Implementasi K3RS di Rumah Sakit Rujukan COVID-19 di Indonesia. *Jurnal Administrasi Rumah Sakit Indonesia*, 9(1), 12-25. <https://doi.org/10.36706/jarsi.v9i1.3339>
- Sanusi, N., Zaman, N., Saputra, I., Usman, S., & . M. (2024). Analysis of Factors Affecting The Implementation of SMK3 (Occupational Safety and Health Management System) Hospitals in Banda Aceh City. *International Journal of Clinical Science and Medical Research*, 04(07), 225-231. <https://doi.org/10.55677/IJCSMR/V4I7-01/2024>
- Siregar, K. (2026). EVALUATION OF THE IMPLEMENTATION OF THE HOSPITAL OHS MANAGEMENT SYSTEM. *Jurnal Kesehatan Ilmiah Indonesia / Indonesian Health Scientific Journal*, 11(1). <https://doi.org/10.51933/HEALTH.V11I1.2708>
- Sukwika Tatan, P. P. D., & Prinajati, P. D. (2023). The Suitability Analysis of the Occupational Safety and Health Management System (OSHMS) Application at the Budhi Asih Jakarta Hospital. *Journal of Applied Management Research*, 3(1), 19-25. <https://doi.org/10.36441/JAMR.V3I1.1567>
- Tsopa, V. A., Cheberiachko, S. I., Yavorska, O. O., Deryugin, O. V., & Aleksieiev, A. A. (2024). THE RELATIONSHIP BETWEEN THE DEVELOPMENT OF A SAFETY CULTURE AND THE IMPLEMENTATION OF SAFETY REQUIREMENTS IN ORGANISATIONS. *Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu*, (6), 101-108. <https://doi.org/10.33271/NVNGU/2024-6/101>
- Vovo, R., Mailina Sari Br Ginting, Y., & Hasibuan, A. (2024). Evaluasi Penerapan Sistem Manajemen Keselamatan dan Kesehatan Kerja (K3) di Rumah Sakit. *JPM MOCCI: Jurnal Pengabdian Masyarakat Ekonomi, Sosial Sains Dan Sosial Humaniora, Koperasi, Dan Kewirausahaan*, 2(1), 99-110. <https://doi.org/10.61492/JPMOCCI.V2I1.113>
- Zabin, L. M., Zaitoun, R. S. A., Sweity, E. M., & de Tantillo, L. (2023). The relationship between job stress and patient safety culture among nurses: a systematic review. *BMC Nursing* 2023 22:1, 22(1), 39-. <https://doi.org/10.1186/S12912-023-01198-9>
- Zahid Faqir Phd. (2024). *Management Commitment in Safety*. 240.

- Zaitoun, R. A., Said, N. B., & de Tantillo, L. (2023). Clinical nurse competence and its effect on patient safety culture: a systematic review. *BMC Nursing* 2023 22:1, 22(1), 173-. <https://doi.org/10.1186/S12912-023-01305-W>
- Zhao, G., & Yin, C. (2023). Impact of job control on hospital workers' safety performance: A moderated mediation analysis of the influences of hospital safety climate and social support. *Nursing Open*, 10(2), 781-789. <https://doi.org/10.1002/NOP2.1345>;JOURNAL:JOURNAL:20541058;PAGE:STRING:ARTICLE/CHAPTER
- Zhelev, Z., de Bell, S., Bethel, A., Clarke, M., Anderson, R., & Coon, J. T. (2025). The implementation of Safety Management Systems in healthcare: a systematic review and international comparison. *Health and Social Care Delivery Research*, 13(7), 1-70. <https://doi.org/10.3310/QPLF8546>