

Original Article

Assessing Occupational Health and Safety Management: A Multi-Center Study of 30 in Primary Health Centers in Indonesia

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¹ Primary Health Centers in Tulungagung Regency, East Java, Indonesia

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ABSTRACT

Background: Occupational Health and Safety (OHS) is critical in ensuring the protection and well-being of healthcare workers, especially in primary health centres (PHCs) where resource limitations often compromise safety standards. In Indonesia, limited data exists on the overall Performance of OHS management across multiple PHCs. This study aimed to assess the current status of OHS management implementation across 30 PHCs in Tulungagung Regency, Indonesia, focusing on the availability of OHS facilities, staff competency, and their association with OHS management outcomes

Methods: A quantitative cross-sectional design was employed involving 30 PHCs selected through simple random sampling. Data were collected using structured questionnaires and checklists assessing facility availability, staff training, and OHS management practices. The OHS implementation instrument consisted of 35 items validated through Pearson correlation ($p < 0.05$; $r > 0.6$) and demonstrated good internal consistency (Cronbach's alpha = 0.762). Descriptive statistics, Chi-square tests, and ordinal logistic regression were used for data analysis.

Results: Most PHCs (76.7%) had complete OHS infrastructure, yet 76.7% lacked trained personnel. OHS management Performance was rated as poor in 63.3% of PHCs, moderate in 6.7%, and good in only 30%. A significant relationship was observed between staff OHS competency and OHS management quality ($\chi^2 = 7.182$; $p = 0.028$). However, regression analysis indicated that facility availability and staff training accounted for only 8.6% of the variance in OHS management outcomes (Nagelkerke $R^2 = 0.086$).

Conclusion: Despite sufficient infrastructure in most PHCs, the lack of trained personnel remains a major barrier to effective OHS implementation. These findings highlight the need for targeted capacity-building and systemic approaches that integrate leadership, policy enforcement, and organizational support to improve occupational health outcomes in primary healthcare settings.

Keywords: Occupational Health and Safety, Primary Health Centers, Health Workforce, Infrastructure, Indonesia, Healthcare Management.

Implications for Practice

- Invest in Staff Training, Healthcare organizations must prioritize regular and comprehensive OHS training for staff to improve their competency and ensure effective implementation of safety practices.
- Strengthen OHS Leadership and Policy Enforcement, Leadership within PHCs should be empowered to enforce OHS policies, ensuring consistent adherence to safety standards and a proactive approach to occupational health.
- Enhance Systemic Support for OHS, A holistic approach to OHS



management is needed, integrating sufficient infrastructure with continuous staff development, leadership support, and clear policy guidelines to improve overall OHS outcomes.

Introduction

Occupational health and safety (OHS) is an integral aspect of healthcare management, directly impacting both the well-being of healthcare workers and the quality of care provided to patients ([Claxton et al., 2022](#); [Flor-Unda et al., 2023](#); [Ngajilo et al., 2023](#)). In primary health centres (PHCs) in Indonesia, healthcare professionals are frequently exposed to various occupational hazards, including physical, chemical, biological, and psychosocial risks. Despite the growing recognition of OHS's importance, many primary health centres face significant challenges in implementing effective OHS management systems ([Caner & Tanir, 2025](#); [Kelmendi et al., 2024](#); [Murphy et al., 2023](#)).

Previous studies on OHS in Indonesia, particularly in the context of primary health centres, have predominantly focused on specific hazards or local case studies ([Woodburn et al., 2021](#); [Yanful et al., 2023](#)). However, there remains a notable gap in research that provides a comprehensive, multi-center evaluation of OHS management practices across the country. While some studies have assessed the general working conditions in PHCs, few have critically examined the integration of formal OHS policies, training, and preventive measures at a national level. Moreover, the lack of standardized OHS frameworks in PHCs across diverse regions of Indonesia further complicates efforts to improve worker safety and health ([Amenah et al., 2025](#); [Laviada-Molina et al., 2020](#)).

This study seeks to bridge these gaps by assessing OHS management practices in 30 primary health centres across Indonesia, evaluating the effectiveness of current safety protocols, identifying barriers to the adoption of best practices, and

recommending improvements. The urgency of this research is underscored by the increasing awareness of healthcare workers' vulnerability to occupational risks and the global call for safer healthcare environments ([Alkouz et al., 2023](#); [Ein et al., 2022](#); [Lawrence, 2024](#)). In particular, as Indonesia's health system continues to evolve, ensuring the protection of primary healthcare workers is essential for the sustainability and effectiveness of healthcare delivery.

Furthermore, this research is crucial for informing policy development and supporting initiatives aimed at enhancing OHS management in primary health centres. It contributes to the broader discourse on improving healthcare environments and protecting the health of healthcare professionals, aligning with global efforts to achieve better working conditions for healthcare workers worldwide ([Dube et al., 2024](#); [Ebi et al., 2021](#)). This study's findings will be particularly relevant to policymakers, healthcare administrators, and occupational health professionals in Indonesia and other countries facing similar challenges. By providing a detailed analysis of the current State's of OHS management across a diverse set of primary health centres, this research aims to serve as a critical resource for improving the occupational health standards in Indonesia's primary healthcare system, offering valuable insights for international audiences concerned with occupational health in low- and middle-income countries.

Methods

Study Design

This study employed a quantitative approach with a cross-sectional design to examine the relationship between

workplace infrastructure, workforce competence, and the implementation of Occupational Safety and Health (OHS) management systems in primary healthcare settings.

Participants

The study was conducted across community health centres (Primary Health Center) in Tulungagung Regency, Indonesia. The total population included 32 Primary Health Centers, each represented by their respective Head of Primary Health Center as the unit of analysis. A total of 30 respondents were selected using simple random sampling, based on the Slovin formula, to determine an appropriate sample size with a confidence level of 95%.

Instrument

The research employed structured questionnaires and checklists as primary instruments to assess three core variables: (1) the availability of infrastructure supporting Occupational Health and Safety (OHS)—including essential items such as emergency exits, fire extinguishers, and first aid kits; (2) the competence of health personnel, particularly their participation in OHS-related training; and (3) the level of implementation of OHS management systems within each Primary Health Center (Puskesmas). The instruments were developed with reference to national occupational health guidelines and were adapted from validated tools used in previous similar studies.

To ensure the instrument's validity and reliability, a pilot test was conducted. A total

of 35 items were included in the instrument assessing OHS implementation, titled “Implementation and Evaluation of Occupational Safety and Health Management at Primary Health Centers.” Validity testing using the Pearson correlation method showed that all items had p-values less than 0.05 and correlation coefficients greater than 0.6, indicating strong correlations between each item and the overall construct. In addition, reliability testing using Cronbach’s Alpha resulted in a coefficient of 0.762, which demonstrates a good level of internal consistency, particularly suitable given the sample size of fewer than 50 respondents.

The variables in the study were classified as follows. The first independent variable, facility availability, was measured on a nominal scale, with each item scored as 1 for “available” and 0 for “not available.” Facilities were categorized as “complete” (score = 2) if all items were present and “incomplete” (score = 1) if at least one item was missing. The second independent variable, workforce competence, was measured using a similar nominal-scale questionnaire. Personnel who had received OHS training scored 2 (trained), while those who had not scored 1 (not trained).

The dependent variable, implementation of OHS management, was assessed using the 35-item questionnaire. Each item was scored 1 for “yes” and 0 for “no.” The total score was categorized into three levels: “Good” (≥ 75%), “Moderate” (56–74%), and “Poor” (≤ 55%).

Table 1. Questionary of Implementation And Evaluation Of The Implementation Of Occupational Health And Safety In Health Centers

Domain and Indicator	Question	Yes	Not
Planning			
Identify hazard sources and assess and control risk factors.	Has an assessment of conditions and events that may cause potential hazards been carried out?		
	Has an assessment been carried out on the types of accidents and PAK that may occur		



Domain and Indicator	Question	Yes	Not
Making Rules	Does the Primary Health Center already have an OHS SOP?		
	Has the OHS SOP ever been evaluated and updated?		
	Are the OHS SOPs socialized to employees or related parties?		
Goals and objectives	Are the SOPs in accordance with the laws and regulations?		
	Does the Primary Health Center have measuring instruments, measurement indicators, achievement goals and achievement periods to measure the potential risks of OHS?		
Performance Indicators	Does the health centre have Performance indicators or the success of SMOHS Primary Health Center?		
Program OHS	Does the Primary Health Center have and implement the OHS program by conducting monitoring, evaluation and reporting?		
Organizing			
Main Tasks	Does the Primary Health Center have a specific OHS implementation unit?		
	If you have an OHS implementation unit, has it been running in accordance with the main tasks?		
	Does the health centre formulate the OHS policy in the decree?		
	Do Primary Health Centers have OHS Guidelines?		
	Does the health centre already have an OHS Program?		
Function	Has the Primary Health Center carried out the collection management of all data and information as well as problems related to OHS?		
	Has the Primary Health Center increased efforts to promote OHS with training/research?		
	Has the Primary Health Center carried out supervision over the implementation of OHS?		
	Do the Leaders of the Health Center provide suggestions and considerations related to corrective actions?		

Domain and Indicator	Question	Yes	Not
Implementation	Has the Primary Health Center ever conducted an investigation and reported if there was a work accident?		
	Does The Primary Health Center Carry Out Ohs Promotion Or Counselling To All Officers?		
	Does the Primary Health Center facilitate OHS training for employees?		
	Is there a health check for officers (preliminary, periodic and special)?		
	Is there a Provision for personal protective equipment and work safety		
	Is there an Emergency prevention and response guideline setup?		
	Is there a placement of workers in jobs that are in accordance with health conditions?		
	Is there a Treatment worker who suffers from illness?		
	Does the Health Center regularly create a hygienic work environment, starting to monitor the work environment for existing hazards?		
	Is there a way to monitor the biological effects of the virus?		
	Does the Health Center carry out worker health surveillance?		
	Monitoring And Evaluation Of Reporting	Has OHS recording and reporting been integrated into the Primary Health Center reporting?	
Has the Primary Health Center Carried Out an OHS Audit?			
Have inspections and tests related to OHS monitoring been carried out?			
Has there been guidance and supervision of work norms for the implementation of worker health facilities and institutions, as well as labour social security norms?			
Has the Primary Health Center implemented the construction and supervision of occupational safety norms?			

Data Collection

Data collection was carried out from October to November 2023, following formal approval from the institutional review board and relevant health

authorities. Questionnaires were distributed in person to each Primary Health Center, and data were compiled once the completed forms were returned.



Data Analysis

Data analysis began with data cleaning, coding, and tabulation, followed by univariate analysis to describe frequency distributions. Multivariate analysis using logistic regression was applied to determine the influence of independent variables (infrastructure and workforce competence) on the dependent variable (implementation of OHS management systems).

Ethical Consideration

All ethical principles of research involving human participants were strictly followed, and informed consent was obtained from each respondent prior to data collection. Anonymity was maintained by assigning codes rather than using names, and confidentiality was preserved by securing all collected data and using them solely for research purposes.

Results

A total of 30 Primary Health Centers (PHCs) in Tulungagung Regency participated in this study. The majority were classified as inpatient PHCs (60%), while the remaining 40% were non-inpatient. In terms of accreditation status, 90% of PHCs had not yet received accreditation, and only 10% were accredited (**Table 1**).

Most PHCs (76.7%) reported having complete occupational health and safety (OHS) facilities, whereas 23.3% lacked essential infrastructure. However, a significant gap was found in staff competency: 76.7% of PHCs had untrained OHS personnel, and only 23.3% had staff who had received formal training in OHS.

OHS management Performance was predominantly rated as poor (63.3%), with 30.0% rated as good and only 6.7% as moderate.

A Chi-square test demonstrated a statistically significant association between staff OHS competency and the quality of OHS management ($\chi^2 = 7.182$; $p = 0.028$), suggesting that trained personnel are more likely to support better safety management implementation.

In contrast, ordinal logistic regression revealed that neither OHS facilities nor staff competency showed a significant effect on OHS management Performance ($p = 0.340$). The model's explanatory power was low, with a Nagelkerke R^2 value of 0.086, indicating that only 8.6% of the variation in OHS management was accounted for by the two variables, leaving 91.4% potentially attributable to other unmeasured factors (**Table 2**).

Table 1. Descriptive Statistics of Primary Health Centers (n = 30)

Variable	Category	Frequency (n)	Percentage (%)
Type of PHC	Inpatient	18	60
	Non-inpatient	12	40
Accreditation Status	Accredited	3	10
	Not Accredited	27	90
OHS Facility Availability	Complete	23	76.7
	Incomplete	7	23.3
Staff OHS Competency	Trained	7	23.3
	Untrained	23	76.7
OHS Management Performance	Good	9	30
	Moderate	2	6.7



Poor

19

63.3

Table 2. Logistic Regression Model Summary

Model	-2 Log Likelihood	Chi-square	df	p-value
Intercept Only	17.298	-	-	-
Final Model	15.141	2.157	2	0.34

Discussion

This study provides a comprehensive overview of the current State's's of occupational health and safety (OHS) management in 30 Primary Health Centers (PHCs) in Tulungagung Regency, Indonesia. The findings underscore critical gaps in the implementation and effectiveness of OHS management, particularly in relation to staff competency and institutional infrastructure.

The descriptive results reveal that although a majority of PHCs are equipped with complete OHS facilities, most lack adequately trained personnel to manage these systems effectively. This highlights a disconnect between infrastructure availability and human resource readiness ([Ham et al., 2020](#); [McConnell & Einav, 2023](#)). While the existence of facilities is a foundational requirement, without competent staff to utilize and maintain these resources, their impact on occupational safety is significantly diminished. This gap is further illustrated by the high percentage of PHCs categorized as having poor OHS management Performance.

The inferential analysis supports these findings. The statistically significant association between staff competency and OHS management Performance indicates that trained personnel are more likely to drive effective implementation. This reinforces the need for continuous capacity-building and structured training programs for healthcare workers in OHS. However,

the logistic regression analysis revealed that OHS facilities and staff competency alone do not fully explain the variability in management outcomes, accounting for only 8.6% of the variance. This suggests the presence of other influencing factors, such as leadership commitment, institutional culture, policy enforcement, and budget constraints, which were not directly assessed in this study ([Mhyre et al., 2022](#); [Ravi et al., 2021](#); [Yong-Hing & Patlas, 2020](#)).

These findings have several practical implications. First, policymakers and healthcare administrators must not only invest in physical infrastructure but also prioritize training and competency development in OHS ([Bahlman-van Ooijen et al., 2023](#); [Bhati et al., 2023](#); [Singh et al., 2024](#)). Second, accreditation processes should include stricter criteria for assessing OHS readiness, as accreditation appears to be limited in its coverage among PHCs. Finally, a more integrated and systemic approach is required—one that combines physical, human, and organizational elements to achieve sustainable OHS outcomes in primary healthcare settings.

Nonetheless, this study has some limitations. It was conducted in a single regency, which may limit the generalizability of the findings to other regions with different resource levels or management systems. Additionally, the study did not examine qualitative aspects such as staff perceptions, management attitudes, or organizational culture, which may significantly influence OHS outcomes.



Future research should adopt a mixed-methods approach and expand the geographical scope to provide a more holistic understanding. Despite these limitations, the study offers valuable insights that can inform targeted interventions to improve OHS management in Indonesian PHCs and similar settings globally.

Relevance to Clinical Practice

This study emphasizes the critical role of Occupational Health and Safety (OHS) management in protecting healthcare workers at primary health centers (PHCs). While infrastructure is often in place, the lack of trained personnel is a significant barrier to effective OHS implementation. Healthcare administrators and policymakers should focus on improving staff competency and integrating systematic approaches to enhance OHS practices and ultimately safeguard the well-being of healthcare workers.

Conclusion

This study highlights significant gaps in the implementation of Occupational Health and Safety (OHS) management across 30 Primary Health Centers (PHCs) in Tulungagung Regency, Indonesia. Despite the availability of OHS facilities in the majority of PHCs, a critical lack of trained personnel hampers the effectiveness of OHS management. The findings underscore the importance of improving staff competency to enhance safety outcomes. Furthermore, the limited explanatory power of OHS facilities and staff competency on management Performance suggests the need for a more comprehensive approach that includes leadership, organizational culture, and policy enforcement. Strengthening these areas is essential to ensure a safer and more sustainable working environment for healthcare workers in primary healthcare settings.

Authors Contributions

The sole author was responsible for the conception and design of the study, data collection, analysis, interpretation of findings, and manuscript preparation.

Conflicts of Interest

The author declares no conflict of interest related to the publication of this study.

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