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RESEARCH ARTICLE

REDUCING THE RISK OF ACCIDENTS AND INFECTIONS IN THE WORKPLACE: EVALUATION OF OHSMS IMPLEMENTATION IN TYPE B HOSPITALS IN ACEH

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Abstract

Background: Hospitals are a work environment with a high risk of occupational accidents and occupational diseases, including infections. The implementation of the Occupational Health and Safety Management System (OHSMS) is crucial to mitigate this risk. However, the effectiveness of SMK3 implementation in Type B hospitals in Aceh, Indonesia, still faces various challenges that require in-depth evaluation. Objective: This study aims to evaluate the factors that affect the successful implementation of SMK3 in Type B hospitals in Aceh. The factors analyzed included policies, planning, implementation practices, monitoring and evaluation, and performance improvement. Methods: This study used a descriptive quantitative design with an evaluative approach. The study sample was the entire population (census) of 9 Type B hospitals in Aceh, with 356 respondents consisting of safety managers, section heads, and related staff. Data collection was carried out through structured questionnaires, interviews, and observations. Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 3.0 software. Results: The results of the analysis showed that policies (t=3.49), implementation practices (t=2.10), monitoring and evaluation (t=4.00), and performance improvement (t=2.39) had a positive and significant influence on the success of SMK3 implementation. Planning factors showed no significant effect (t=1.95; p=0.052). The research model showed high predictive power (R^2 = 0.88). Conclusion: The successful implementation of SMK3 in Type B hospitals does not depend only on written policies, but is significantly influenced by implementation practices in the field, a strong monitoring and evaluation system, and a commitment to continuous performance improvement. Reinforcement on these aspects is essential to create a safe and healthy work environment.

Introduction:-

Background.

In Indonesia, hospitals are classified into 4 types (small/D, medium/C, large/B, very large/A)[1]. Hospitals are facilities that serve thousands of patients every day, hospitals are not only faced with challenges in handling infectious diseases but are also at risk of various types of accidents that can threaten the safety of patients, medical personnel, and visitors[2]. WHO notes that about 7% of patients in global hospitals are infected due to medical treatment, musculoskeletal disorders in medical personnel in hospitals as much as 32% due to the physical burden of

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their work and stress and burnout in medical personnel, especially doctors and nurses due to long working hours, high workload, and psychological stress[3], [4].
Accidents such as fires, explosions, accidents related to electrical installations, as well as injuries from medical equipment and other facilities, are threats that cannot be ignored in a hospital environment[5], [6]. According to WHO data, hospitals are one of the places with a high level of risk of occupational accidents, especially those related to the safety of patients and health workers[7]. Therefore, to reduce this potential risk, an effective system for managing occupational safety and health in hospitals is required[8].

One of the systems adopted to ensure a safe working environment is the OHSMS which is designed to identify, control, and mitigate risks related to occupational safety and health in an organization, including hospitals[9]. In Indonesia, the implementation of OHSMS in hospitals has been regulated in various regulations[10], which requires the implementation of occupational safety and health standards in all hospitals. However, the implementation of OHSMS in hospitals, especially in type B hospitals in Aceh, still faces several challenges. Factors such as policy setting, planning, operations, monitoring and evaluation and performance review are often the main obstacles to successful implementation that is effective in reducing the potential for accidents and infections. Effective implementation of OHSMS will not only improve the safety of patients and medical personnel but also has the potential to improve the overall quality of health services[11].

Problem Statement

Hospitals serve as centers of healing and treatment for the community[12], but the hospital environment itself can be a place of high risk for accidents and infections[13], [14]. Potential hazards such as fires, explosions, accidents related to electrical installations, and injuries from medical devices and other facilities can threaten the safety of patients, medical personnel, and hospital visitors[15], [16]. These risks are not only related to physical environmental factors but are also influenced by managerial and procedural aspects of hospital management[17], [18]. The OHSMS is one of the approaches adopted to reduce the risk of safety hazards and create a safe working environment for all parties by integrating safety and health standards in all aspects of hospital operations[17], [18].In type B hospitals in Aceh, OHSMS implementation has not been fully optimized in effectively reducing the risk of accidents and infections when viewed from factors such as policy setting,planning, implementation, monitoring/evaluation and performance review. These factors are known to have an influence on improving the implementation of the OHSMS[19].
Although type B hospitals in Aceh play an important role in health services, there is no research that examines in depth the factors that influence the successful implementation of OHSMS in all hospitals, as well as its impact on reducing accidents and infections. The limited number of studies that focus on OHSMS implementation in hospitals, especially in the Aceh region, adds to the urgency of this research to provide a clearer and more applicable understanding.This study focuses on identifying the factors that influence the success of OHSMS implementation in type B hospitals in Aceh and the influence between each variable. This research is expected to provide a more accurate picture of the effectiveness of OHSMS implementation and provide recommendations for improving work safety policies and procedures in hospitals.

Research Objectives:-

This study aims to look at the factors that influence the successful implementation of OHSMS in Type B Hospitals in Aceh in reducing the risk of accidents and infections that can endanger the safety of patients, medical personnel, and visitors. Specifically, the purpose of this study is to analyze the factors that influence the successful implementation of OHSMS in hospitals consisting of policy factors, planning, OHS practices, monitoring and evaluation and performance improvement. Then also see the influence of each variable on other variables. The results of this study are expected to provide useful strategic recommendations for hospital management in Aceh, as well as other hospitals in Indonesia, in optimizing the implementation of OHSMS to create a safer, more efficient, and healthier environment for all parties involved. This research also seeks to contribute to the development of more effective health policies in terms of occupational safety, particularly in the context of hospitals facing various challenges in regions with different geographical and socio-economic characteristics.

Gap Analysis

Research on the implementation of OSHMS in type B hospitals in Aceh is limited. Most studies focus on the industrial sector or hospitals in urbanised areas with developed infrastructure, without considering the unique socio-geographical conditions of Aceh.The existing literature emphasises the general theory of OSHMS and its effectiveness in reducing occupational accidents, but has not examined specific contextual, operational and

structural factors in type B hospitals. There is also a lack of evaluation of the implementation of national OSHMS policies in a regional context.The lack of empirical studies analysing the real impact of OSHMS implementation on the risk of accidents and infections in type B hospitals in Aceh suggests a research gap. This study aims to fill this gap by examining the policy, operational and cultural factors that influence the success of OSHMS in the region.

Novelty and Research Justification

This research offers novelty by focusing on the evaluation of the OHSMS in Type B hospitals in Aceh, an area that has not been extensively studied in relation to OHSMS implementation in healthcare. Unlike previous studies which focus on industrial or urban hospital settings, this research highlights the local challenges and factors that influence OHSMS effectiveness in regions with unique social and geographical characteristics. The study examines both policy and practical factors such as staff training, infrastructure limitations, and safety culture within the hospital. The justification for this research lies in the need for deeper insights into how OHSMS can be effectively implemented to reduce risks to both patients and healthcare workers, particularly in Aceh. The study aims to contribute to occupational safety policy in healthcare and provide practical recommendations for hospitals aiming to improve their OHSMS.

Research Methods:-

This study used a descriptive quantitative design with an evaluative approach[20] to assess the implementation of OSHMS in type B hospitals in Aceh. The entire population, 9 type B hospitals in Aceh, was sampled through the census method to ensure comprehensive representation. Data were collected from 356 respondens through structured questionnaires and in-depth interviews with safety managers, section heads and relevant staff, as well as direct observation of the physical and operational conditions of the hospitals. Variables measured included staff training, safety awareness, supporting infrastructure, and safety policy effectiveness. Data were analysed using Partial Least Squares Structural Equation Modeling (PLS-SEM) technique through SmartPLS 3.0[21], [22], with stages of construct validity and reliability testing, measurement model evaluation, and structural model testing to test hypotheses. This approach provides a comprehensive picture of the key success factors of OSHMS implementation in reducing the risk of accidents and infections in hospitals.

Research Findings

The results of the analysis using SmartPLS version 3.0 indicate a significant relationship between various factors influencing the implementation of OHSMS in type B hospitals in Aceh. OHSMS policies on the success of OHSMS implementation (t=3.49, p=0.000), OHSMS planning on the success of OHSMS implementation (t=1.95, p=0.052), OHSMS implementation on the success of OHSMS implementation (t=2.1, p=0.000), OHSMS monitoring and evaluation on the success of OHSMS implementation (t=4.0, p=0.000), and performance improvement on the success of OHSMS implementation (t=2.39, p=0.000), and the R^2 value reached 0.88 (0.25-0.75), indicating that the model is fit and classified as strong. The results of the calculations indicate that not all variables have a significant influence on the implementation of OHSMS in type B hospitals in Aceh. The findings of this study suggest that the implementation of OHSMS policies should not merely remain on paper but must be implemented through proper planning, appropriate execution, ongoing monitoring and evaluation, as well as support from performance improvements related to OHSMS.

Discussion:-

The results of the analysis showed a significant relationship between various factors affecting OHSMS implementation in type B hospitals in Aceh. These findings are consistent with occupational safety and health management system theory, which emphasises the importance of integrating policy, planning, practice, monitoring, evaluation and performance improvement in achieving workplace safety objectives [23].

Firstly, OHSMS policy was shown to have a significant influence on OHSMS implementation (t=3.49; p=0.000). This finding corroborates [24] view in the Policy Implementation Model, which states that clear policies and management commitment are critical in the successful implementation of management systems. In the hospital context, an in-depth and consistently implemented OHSMS policy is the basis for mitigating the risk of accidents and infections.

OHSMS planning was somewhat different as it showed an insignificant relationship with implementation of the system (t=1.95; p=0.000). This finding does not support the Plan-Do-Check-Act (PDCA) principles outlined in ISO 45001, where thorough and risk-based planning is a fundamental element to ensure the effectiveness of the OHSMS

system. These results suggest that type B hospitals in Aceh need a more structured, comprehensive planning strategy with participatory principles especially for designing procedures that reduce the potential for accidents and infections. We know that participation increases ownership of the OSHMS programme.The same thing was also found by Hening et al. (2019), Maehira et al. (2009) dan Rhee et al. (2014)[25], [26], [27]

The effect of OHSMS practices on OHSMS implementation (t=2.10; p=0.000) was also significant. This result underscores the importance of the correct application of safety procedures and measures in the field, in accordance with the standards set out in policies and plans. This was also mentioned by Ajmal et al. (2022) dan Nasrallah et al. (2022) [28], [29].

Implementation Science proposes that the application of appropriate and widely accepted practices by medical staff is a key factor for the success of occupational safety programmes in hospitals[30].
OHSMS monitoring and evaluation showed the strongest influence on OHSMS implementation (t=4.00; p=0.000). This emphasises the importance of a continuous monitoring system to detect gaps in OHSMS implementation and take immediate corrective action. In accordance with guidance from the Occupational Safety and Health Administration (OSHA, 2016), effective monitoring is a key component to assessing the success of safety and health programmes in the workplace, including hospitals[31].
Finally, improved OHSMS performance was also found to have a significant effect (t=2.39; p=0.000). This performance improvement is related to the continuous improvement approach that focuses on continuous innovation in safety procedures. In line with Deming's Cycle theory (1986), each OHSMS evaluation cycle should be followed by continuous improvement actions to reduce incidents and improve the quality of medical services[32], [33].

Comparison with Previous Studies
The findings of this study are in line with previous research showing that factors such as policy, planning, implementation, and continuous evaluation have a significant contribution to the reduction of occupational accidents and infections by Yorio and Wachter (2014)[34], [35]. This research also strengthens the results of the study by Kwon et al. (2021) which showed that hospitals with good OHSMS implementation experienced a 30% reduction in the incidence of occupational accidents[36], [37]. However, the findings also suggest that in Aceh, local context factors, such as hospital capacity, organisational culture and staff training, play an important role in determining the effectiveness of OHSMS implementation. Therefore, although there are similar patterns to other studies, local adaptation of safety policies is key to success.

Research Limitations:-
Although this study contributes significantly to the understanding of OSHMS implementation in type B hospitals, there are some limitations. First, the use of a limited sample of type B hospitals limits the generalisation of the findings to other types of hospitals or different industry sectors. Second, data collection methods such as surveys and interviews have the potential to cause respondent bias. Third, the analysis model using SmartPLS 3.0 has not included all relevant external variables, such as organisational culture factors and social dynamics. Therefore, further research with broader coverage and additional variables is needed to gain a more comprehensive understanding.

Practical Implications
The findings of this study provide several practical implications that need to be considered, namely, OHSMS policies must be strengthened with real commitment from hospital management, not just as administrative documents, careful, participatory and risk-based planning is essential to ensure that workplace safety and health procedures can be carried out effectively and efficiently. Regular staff training on safety and health practices in accordance with OHSMS standards is also necessary to reduce incidents in hospitals. A continuous monitoring and evaluation system should be implemented to ensure that any potential risks are detected early and corrected quickly. Continuous performance improvement should be part of the hospital culture to achieve long-term safety goals.

Theoretical Contributions
This study makes a significant contribution to developing the theory of OHSMS implementation, particularly in the context of type B hospitals in developing countries. The findings support the understanding that effective OHSMS implementation depends not only on written policies, but also on the quality of planning, implementation of appropriate practices, timely evaluation and continuous performance improvement.

In addition, this study reinforces the importance of a systematic and integrative approach to managing occupational safety and health in hospitals, involving all elements of the organisation.

Limitations and Future Research Directions

While these findings provide valuable insights, there are several limitations that need to be considered. First, this study only examined type B hospitals in Aceh, so generalisation of the results to hospitals of different types and regions needs to be done with caution. Further research could expand the scope to type A and C hospitals, as well as examine contextual factors such as local regulations and the education level of medical personnel that may influence OHSMS implementation.

In addition, this study used quantitative methods with SmartPLS analysis, which provides an overview of the relationship between variables, but does not delve deeper into the dynamics that influence each factor. Therefore, qualitative or mixed-methods research that combines in-depth interviews and field observations will provide a more comprehensive understanding of OHSMS implementation in hospitals.

Conclusion:-

This study found that a clear and comprehensive OHSMS policy has a significant influence on OHSMS implementation in hospitals. Good OHSMS planning, based on risk and sufficient resources, plays an important role in ensuring smooth OHSMS implementation. OHSMS practices implemented in accordance with planned policies and procedures contribute greatly to the success of the safety management system. Continuous monitoring and evaluation is crucial to detect non-conformities and improve the OHSMS system in real-time. Continuous performance improvement is a key factor to maintain and improve the effectiveness of the OHSMS in the long run. Overall, this study reveals that OHSMS implementation is not just a policy on paper, but should involve careful planning, proper implementation, regular evaluation, and continuous performance improvement.

Suggestions

Some suggestions that can be given include Strengthen the OHSMS Policy to ensure that the OHSMS policy is implemented consistently and not only as an administrative document but clearly communicated to all hospital staff and integrated into the culture of the organisation. Improved OHSMS Planning through the development of more mature, risk-based, participatory OHSMS planning and supported by adequate resources. Proper Implementation of OHSMS Practices in accordance with policies and plans and consistently applied throughout the hospital so that regular training and upskilling is required for all hospital staff to ensure they can implement procedures properly. Continuous Monitoring and Evaluation should be strengthened to enable early detection of potential problems and take prompt, data-driven corrective actions that improve the effectiveness of risk management in the hospital. The focus on Continuous Performance Improvement adopts the principle of continuous improvement to ensure that the OHSMS system continues to evolve in accordance with changing needs and challenges.

Further research is recommended to explore contextual factors that influence OHSMS implementation, such as organisational culture, education level of medical personnel, and hospital capacity, which can act as moderating or mediating variables in the study and can be conducted using a mixed-methods approach.

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