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Impact Of EWS Implementation On The Quality Of Inpatient Services In Indonesian Hospitals : Literature Review

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Abstract

The Early Warning Score (EWS) is a clinical monitoring system used in inpatient settings to detect early signs of patient deterioration. EWS is expected to improve hospital service quality, particularly in patient safety. This article aims to review the impact of EWS implementation on the quality of inpatient care in hospitals in Indonesia using a literature review method. Data were obtained from six open access scientific articles published in 2020-2026 through searches on Google Scholar, ScienceDirect, and Garuda Portal with the keywords "Early Warning Score" AND "Service Quality" AND "Inpatient" AND "Hospital". The review shows that EWS holds great potential in reducing mortality and enhancing early detection of clinical deterioration. However, its effectiveness highly depends on system quality, healthcare provider engagement, and organizational support. Low usage rates of EWS remain a significant barrier to achieving its full benefits. EWS implementation contributes positively to the quality of inpatient services, but optimal application is necessary to maximize its clinical impact.

Keywords: ***Early Warning Score, Service Quality, Inpatient Care, Hospital, Patient Safety.***

INTRODUCTION

Inpatient care is an essential component of the healthcare system, aiming to provide comprehensive care to patients requiring ongoing observation, diagnosis, therapy, and rehabilitation in a hospital setting. The quality of inpatient care is a crucial indicator in assessing a hospital's success and effectiveness in providing safe, timely, efficient, patient-centered, and equitable care. Improving the quality of inpatient care not only impacts patient satisfaction but also improves clinical outcomes, such as reduced mortality, morbidity, and length of stay (LOS).

In the hospital setting, patients' conditions can undergo rapid and unexpected clinical changes, which, if not detected and promptly addressed, can lead to deterioration, organ failure, cardiac arrest, and even death. Inpatient mortality remains a serious concern. Various factors can influence patient mortality, including the patient's clinical condition upon admission, the severity of the disease, and the response and interventions provided by healthcare professionals.

To identify and respond to deteriorating patient conditions early, various early warning systems (EWS) have been developed. One widely used and proven effective instrument is the Early Warning Score (EWS). The EWS is an objective assessment system based on a patient's physiological parameters such as heart rate, respiratory rate, blood pressure, temperature, level of consciousness, and oxygen saturation. The resulting score can indicate the patient's risk of deterioration, thus triggering a rapid clinical response from the medical team. The EWS serves as an effective screening tool to detect clinical changes in patients and enables nurses to report and intervene in a timely manner (Anderson & Rantepadang, 2025).

The implementation of an EWS is expected to have a positive impact on the quality of inpatient care. This system enables early detection of clinical changes, reduces adverse events (such as cardiac arrest), and increases the efficiency of medical team responses. With early detection and rapid intervention, it is hoped that this will lead to a decrease in patient mortality rates, a reduction in length of stay, and a reduction in referrals to intensive care units such as the HCU/ICU. Effective EWS implementation can even minimize "code blue" activations (Milizia et al., 2023).

While the potential benefits of EWS are significant, the success of their implementation depends on various factors, including the use of the system by healthcare workers. System quality, user satisfaction, and organizational support are important factors influencing the level of EWS adoption in hospitals. Studies have shown that EWS implementation has been successful in reducing

patient mortality, although the focus may vary, such as on COVID-19 patients (Kristianingsih et al., 2023).

Given the urgency of improving the quality of inpatient care and the significant potential of EWS in supporting this goal, as well as the varying results and factors influencing implementation success, a comprehensive literature review is essential. This review will deeply analyze the impact of Early Warning Score implementation on various aspects of inpatient care quality in hospitals, evaluating existing evidence from various studies.

RESEARCH METHODS

This article is a literature review that aims to analyze and synthesize scientific evidence regarding the impact of Early Warning Score (EWS) implementation on the quality of inpatient care in hospitals. The study was conducted using the PRISMA guidelines. The literature search and selection process involved four stages: identification, screening, eligibility assessment, and inclusion. To illustrate the selection process in a transparent and structured manner, a PRISMA flowchart was used.

The scientific article search process was conducted online through various databases such as ScienceDirect, Google Scholar, and Garuda Portal. The search strategy was specifically designed to ensure the relevance of the articles found. The keywords used were "Early Warning Score" AND "Service Quality" AND "Inpatient" AND "Hospital." The Boolean operator "AND" was used to filter articles containing all four key concepts simultaneously, thereby increasing the specificity of the search results.

The literature selection process consists of two main processes: screening and eligibility. In the screening stage, an initial assessment is made based on the title and abstract to determine suitability to the research topic. Irrelevant articles are immediately excluded. Articles that pass the eligibility assessment stage then enter the eligibility assessment stage, where the full content of the article is reviewed to ensure compliance with the inclusion criteria. The inclusion criteria for this study include: (1) Scientific articles (not essays, opinions, or other non-scientific works); (2) Discussing the impact of Early Warning Score (EWS) implementation on the quality of hospital inpatient services; (3) Published at least in 2020; (4) Research conducted in Indonesia; (5) Available in an open access version and can be accessed in full text form.

In the initial stage, 64 articles were identified. After reviewing to avoid duplication, 5 articles were removed due to duplication, leaving 59 articles for further screening. The screening stage was conducted by reviewing titles and abstracts to assess their initial relevance to the study topic, namely the impact of Early Warning Score (EWS) implementation on the quality of hospital inpatient services. From this process, 29 articles were declared irrelevant and were excluded from the study. The remaining 30 articles were then further evaluated through full-text review. From this in-depth evaluation, only 6 articles met all inclusion criteria. These six articles were then further analyzed as the basis for discussion and conclusions in this literature review. The following is a description in the PRISMA diagram.

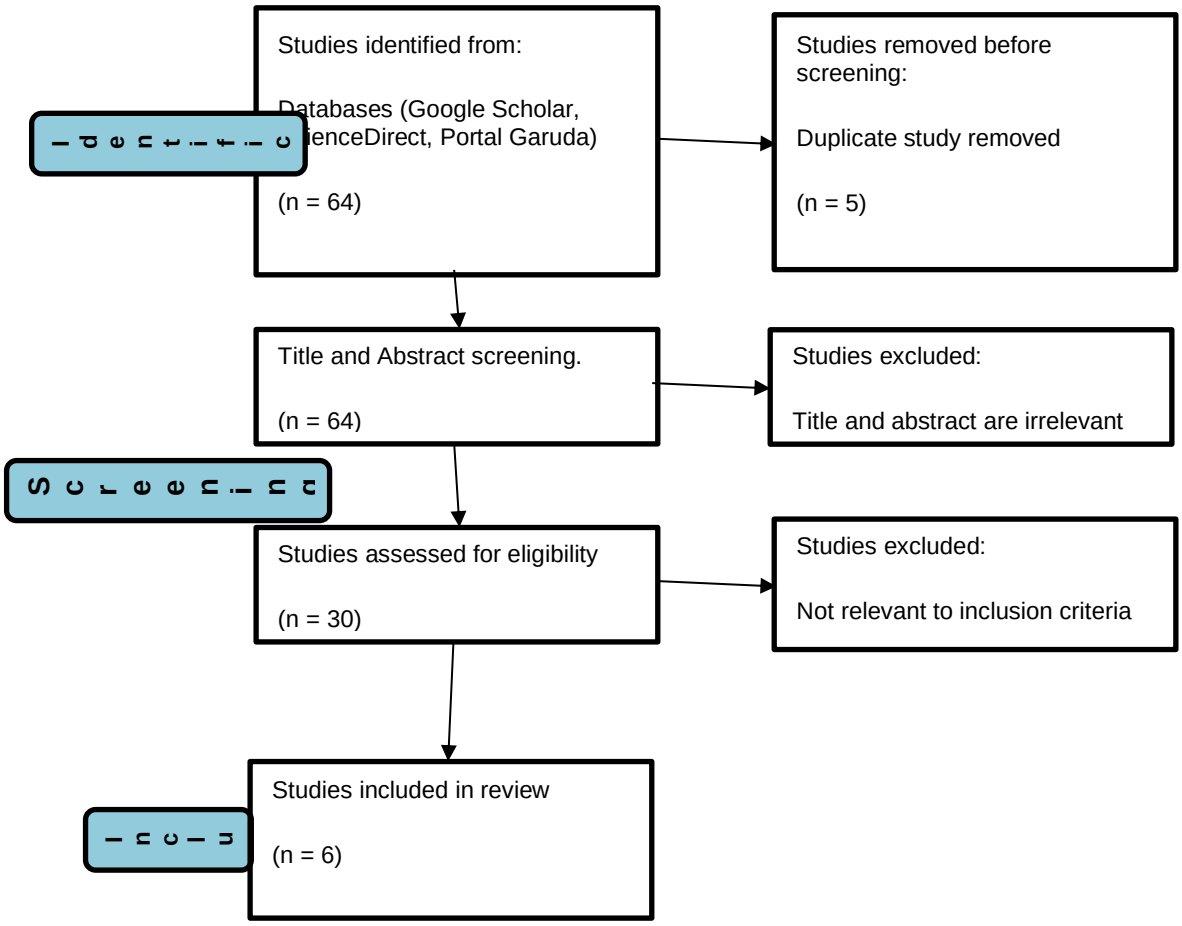

Figure 1. PRISMA Diagram

RESULTS AND DISCUSSION

Table 1. Article Review Results

Author's Name (Year)	Purpose	Research Design	Sample	Results
Megawati et al. (2021)	Analyze the impact of EWS implementation on the quality of inpatient care, including mortality, length of stay, referrals to the HCU/ICU, and code blue activation.	The descriptive method used was correlational. The data obtained were analyzed univariately using frequency distribution and bivariately using Chi-square correlation tests.	All adult patients (≥16 years) in the Inpatient Ward (278 patients)	The results showed no correlation between the EWS score and length of stay, while there was a correlation for mortality with a p-value <0.001. Referrals to the ICU/HCU and code blue activation could not be analyzed due to data homogeneity, requiring a larger sample size and case variation. The EWS can be used as a predictor of inpatient service quality by examining patient outcomes.
Hidayat et al. (2020)	Comparing patient outcomes	Comparative analysis using simple random	The population of	This study found that the implementation of the Early Warning System (EWS) at Hospital

Author's Name (Year)	Purpose	Research Design	Sample	Results
	before and after the implementation of EWS on patient clinical changes is related to the extent to which EWS has been implemented at Hospital X.	sampling.	inpatient medical records was 19,810, and 377 medical records were sampled.	X has not significantly impacted the quality of inpatient care because its utilization rate remains low (22.81%). There were no significant changes in the mortality rate (NDR) and length of stay (LOS), while the increase in code blue activations and the decrease in ICU admissions actually indicate a trend that deviates from the system's objectives. Only the decrease in ICU admissions showed results that met expectations, but this was likely influenced by factors external to the EWS. Therefore, the suboptimal implementation of the EWS has resulted in its benefits on service quality not being maximized.
Raharni et al. (2023)	Identifying factors influencing the mortality rate of adult inpatients ≥48 hours after hospitalization and developing a program plan to reduce hospital mortality at the Gadjah Mada University Hospital.	Mix method with sequential explanatory approach.	388 adult patients hospitalized for ≥48 hours and aged ≥18 years.	This study shows that an Early Warning System (EWS) score of >5 is significantly associated with inpatient mortality within 48 hours. However, implementation in the field remains suboptimal due to weak clinical follow-up, limited ICU capacity, and poor understanding of the EWS among healthcare workers. Consequently, the EWS's potential to improve service quality, particularly in patient safety and clinical risk management, has not been fully realized.
Listiana et al. (2025)	To determine the risk between patients with high-risk EWS and mortality in COVID-19 patients at the University of Indonesia Hospital, and to assess the survival rate of COVID-19 patients.	Retrospective cohort	740 hospitalized patients diagnosed with COVID-19 aged ≥18 years.	Research at the University of Indonesia Hospital showed that COVID-19 patients with a high Early Warning System (EWS) score (>5) had a 5.32 times greater risk of death than patients with a low score, with a cumulative survival probability of only 47.4% at day 74. These findings confirm that the EWS is an effective predictive tool in detecting clinical deterioration early in hospitalization. Its impact on service quality is significant, particularly in terms of patient

Author's Name (Year)	Purpose	Research Design	Sample	Results
				safety, clinical effectiveness, and resource allocation efficiency, provided it is accompanied by a rapid response and appropriate interventions.
Hidayat et al. (2020)	Analyzing the relationship between factors related to EWS use by adopting the HOTFit method.	Cross-sectional using the HOT-Fit (Human, Organization, Technology Fit) evaluation model, primary data collection using questionnaires.	168 medical personnel in the Inpatient Installation, consisting of 106 nurses, 19 on-call doctors, and 42 doctors.	This study shows that the Early Warning System (EWS) utilization rate at Hospital X remains very low (only 10.12% is categorized as good), due to a weak organizational structure, low user satisfaction, and inadequate system quality. These implementation barriers directly impact the quality of hospital services, particularly in terms of patient safety and clinical effectiveness. Rather than improving early detection of critical conditions, the EWS actually creates an additional burden on medical personnel due to a lack of system integration and managerial support.
Bobonera, et al. (2024)	Describes the application of EWS to clients with cardiovascular system disorders, including emergency risk, respiratory rate, oxygen saturation, use of oxygen supplements, systolic blood pressure, pulse rate, level of consciousness, and body temperature.	Descriptive observational with cross sectional approach	48 cardiovascular patients treated in regular inpatient wards.	This study demonstrates that the Early Warning System (EWS) application for cardiovascular patients at KRMT Wongsonegoro Regional Hospital (RSUD) is capable of identifying the majority of patients in the moderate-risk category, with key influencing variables being respiratory rate, body temperature, and oxygen use. Although a direct relationship between EWS use and clinical outcomes (e.g., reduced mortality or length of stay) has not been analyzed, the system's implementation shows potential in supporting early detection and more appropriate treatment planning. Its impact on hospital service quality is promising, particularly in terms of patient safety and service effectiveness. However, an integrated follow-up system is still needed to maximize clinical outcomes.

The Early Warning Score (EWS) is a system designed to detect early deterioration in the clinical condition of hospitalized patients through monitoring physiological parameters. Based on six reviewed scientific articles, EWS implementation has been shown to contribute to the quality of inpatient care, particularly in terms of patient safety and the effectiveness of clinical responses. However, research results show variations in implementation effectiveness, influenced by technical factors, organizational factors, and the competence of medical personnel.

Several studies have shown a significant association between a high EWS score and an increased risk of death. Research by Raharni et al. (2023) at Gadjah Mada University Hospital (RSA UGM) showed that patients with an EWS score >5 had a 4.5-fold greater risk of death than patients with a low score. Similar findings were also obtained by Listiana et al. (2025) at the University of Indonesia Hospital, where high EWS scores in COVID-19 patients had a 5.32-fold greater risk of death, with a survival rate of only 47.4%. These results strengthen the evidence that the EWS is effective as a predictive tool in detecting critical conditions early and contributing to improved patient safety.

However, the effectiveness of an EWS is significantly influenced by the quality of implementation. A study by Hidayat et al. (2020) showed that although an EWS had been implemented at Hospital X, its utilization rate was still low (only 10.12% were categorized as good). The main obstacles stemmed from low user understanding, lack of training, and the system's lack of integration into clinical workflows. As a result, the benefits of an EWS on service quality were not optimally achieved. Organizational factors and user satisfaction were shown to be important determinants of the effectiveness of EWS use, as demonstrated by the HOT-FIT model used in the study.

Different findings come from Bobonera et al. (2024), who focused on patients with cardiovascular disorders. Although the study was descriptive in nature, the results suggest that the EWS can help map patients' risk of emergency, allowing for faster preventive action. While it has not directly analyzed clinical outcomes such as mortality or length of stay, this study suggests that the EWS also has the potential for widespread application in the context of chronic diseases.

Meanwhile, comparative studies by Megawati et al. (2021) and Hidayat et al. (2020) paint a different picture. In hospitals with low EWS utilization rates, no significant changes were found in quality indicators such as Net Death Rate (NDR) and Length of Stay (LOS). In fact, the increase in code blue activations and the decrease in HCU admissions indicate that without robust and consistent implementation, EWS cannot have a maximum impact on service quality.

CONCLUSION

Based on a review of six scientific articles, the implementation of the Early Warning Score (EWS) has been shown to have significant potential in improving the quality of inpatient care in hospitals, particularly in terms of patient safety and the effectiveness of early detection of critical conditions. However, this positive impact is highly dependent on the quality of implementation in the field, including the level of understanding and involvement of healthcare workers, organizational support, and system integration into clinical workflows. To maximize the benefits of the EWS, efforts are needed to increase education, training, and improve support systems so that its implementation can run optimally and contribute significantly to improving patient clinical outcomes.

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