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Relationship between quality of care and length of stay in the emergency department: A systematic literature review

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Abstract

Background: Quality of care affects patient outcomes and health system efficiency. In the emergency department, length of stay is an important indicator influenced by several factors such as clinical skills, communication, and resource management.

Purpose: To explore the relationship between quality of care and length of stay in the emergency department.

Method: A Systematic Literature Review (SLR) with PRISMA guidelines, reviewing articles between 2014 and 2024 regarding the impact of quality of care on length of stay in the emergency department.

Results: Decreased quality of care, such as delays in service and lack of resources, can increase length of stay, while better care can reduce length of stay.

Conclusion: Improving the quality of care in the emergency department can reduce length of stay and result in better and more efficient care. Further research is needed to identify specific strategies to improve quality and reduce length of stay.

Keywords: Emergency Service; Hospital; Length of Stay; Nursing Care; Quality of Health Care.

INTRODUCTION

Quality of care is one of the main elements in health services. In general, quality of care is defined as the ability to provide services that meet quality standards and contribute significantly to patient well-being (Alharbi, Alzahrani, Almarwani, Asiri, & Alhowaymel, 2023). In the context of nursing, quality of care includes aspects of caring, nurse-patient relationships, and fulfilling patient needs holistically, including physical, communicative, psychological, and social aspects (Azimilolaty, Rezaei, Khorram, Mousavinasab, & Heidari, 2021; Juanamasta, Aungsuroch, & Gunawan, 2021). Quality care documentation also plays an important role in improving care outcomes, such as through structured reports and patient responses to interventions provided (Sulistyawati & Susmiati, 2020). One indicator of quality of care is "missed care", namely aspects of care that should have been provided but

were ignored or delayed. Research in 458 hospitals from a four-state survey of random samples of licensed nurses, shows that improving the work environment and hospital staffing can reduce missed care, thereby improving the quality of care and overall patient health outcomes (Lake, Riman, & Sloane, 2020). Thus, good quality of care not only improves patient satisfaction and well-being but also drives the performance efficiency of health institutions (Ampaw, Chai, Liang, Tsai, & Frempong, 2020).

One indicator that is closely related to the quality of care is length of stay. Length of stay is defined as the number of days since the patient was admitted until discharged or transferred to another unit (Rodovanski, Réus, & Neves dos Santos, 2023). Length of Stay is an important indicator in hospital services because it reflects the quality of care and the efficiency of hospital resource use (Fadhilah &

Dhamanti, 2024). Length of stay has a significant impact on hospital operational costs, patient satisfaction, and disease severity and mortality (Chrusciel, Girardon, Roquette, Laplanche, Duclos, & Sanchez, 2021). Problems related to length of stay often arise due to the increasing number of patients exceeding the capacity of hospital services, the complexity of patient cases requiring intensive care, high patient readmission rates, and the need to optimize the overall health care system (Simond, Arif, & Murni, 2023).

Prolonged length of stay can have negative impacts on both patients and health institutions. From the patient's perspective, a long length of stay increases the risk of nosocomial infections and decreases the level of satisfaction with services (Belayneh, Temachu, Messelu, & Gebrie, 2023). From the hospital perspective, the extension of length of stay can result in increased operational costs and reduced availability of beds for new patients (Vongsachang, Iftikhar, Canner, & Woreta, 2023). Therefore, good quality of care is essential to reduce length of stay, improve service efficiency, and ensure the sustainability of health services.

International standards stipulate that the length of stay in the emergency department should be less than 8 hours (Gun, Gandini, & Firdaus, 2023). However, practices in various countries show variations, such as in the UK, Australia, Iran, Canada, and America, where the average length of stay is around 4 hours, and for Indonesia, the standard length of stay in the ER is 6 hours (Kusumaningrum, Supardi, & Winarti, 2020). Research at Cibinong Regional Hospital revealed that the average patient waiting time in the ER was less than 6 hours, with 54.4% of patients having a length of stay below 6 hours, while the other 45.6% were more than 6 hours. Length of stay in the emergency department can cause crowding, delay services, and increase mortality rates and length of stay (Wahab, Jak, & Kodyat, 2021).

Although the quality of care in the emergency department has been widely discussed in various studies, the relationship between quality of care and length of stay has not been studied in depth. Most previous studies have focused more on how quality of care affects patient health outcomes or patient satisfaction, without directly linking it to the length of time patients stay in the emergency department. This suggests that an in-depth study is needed on how

improving the quality of care, including aspects of communication, clinical skills, and time management, can directly affect the duration of patient length of stay in the emergency department (Rodovanski, Réus, & Neves dos Santos, 2023).

RESEARCH METHOD

The research method used is Systematic Literature Review (SLR), which aims to analyse relevant literature related to the relationship between quality of care and length of stay of patients in the emergency department.

A literature search was conducted on the PubMed database, with articles published between 2014 and 2024. The search terms used the Boolean operators "AND" and "OR" to find articles with the following keyword combinations: ("quality of care" OR "healthcare quality" OR "care quality") AND ("length of stay" OR "hospital stay" OR LOS) AND ("emergency department" OR "emergency room" OR "emergency unit" OR "ED").

Inclusion criteria include articles written in English, in the form of research results or literature studies conducted in the emergency department for adult or pediatric patients, as well as articles with full access (free full text) that can be downloaded without a subscription. Exclusion criteria were articles that were not conducted in the emergency department, articles in languages other than English, articles published before 2014, and articles that did not have a complete structure (e.g., not listing research methods, research results, or identity).

In the initial stage, articles were filtered according to the inclusion criteria, and those that were not relevant to the topic were excluded. Next, screening was carried out based on the title, ensuring that at least one of the related terms, namely "quality of care," "length of stay," or "emergency department," was included. In the final stage, exclusion criteria were applied so that articles that were not in full text or did not contain information about the relationship between quality of care and length of stay were eliminated. Finally, 10 articles out of 787 were found to meet the inclusion criteria, as explained through the PRISMA diagram shown in *Figure 1*.

The data extraction process was conducted to collect relevant information regarding the relationship between quality of care and length of stay in the emergency department. Each article that met the

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inclusion criteria was evaluated to identify key variables related to quality of care, such as clinical effectiveness, patient satisfaction, and the time and method of care received. The extracted information included the author, title, study design, main outcome, and key findings related to quality of care, which were then analyzed to identify significant patterns or relationships between the two variables.

Article quality assessment was conducted using the Joanna Briggs Institute (JBI) quality assessment

tool. There are several questions to guide the review assessment. Each question must be answered with “yes”, “no”, or “unclear”, and Not Applicable “NA”. Any article that meets at least six of the ten assessment criteria is considered to be of good enough quality and can be used for further analysis. This quality assessment was conducted independently by two reviewers to ensure objectivity and reduce potential bias.

RESEARCH RESULTS

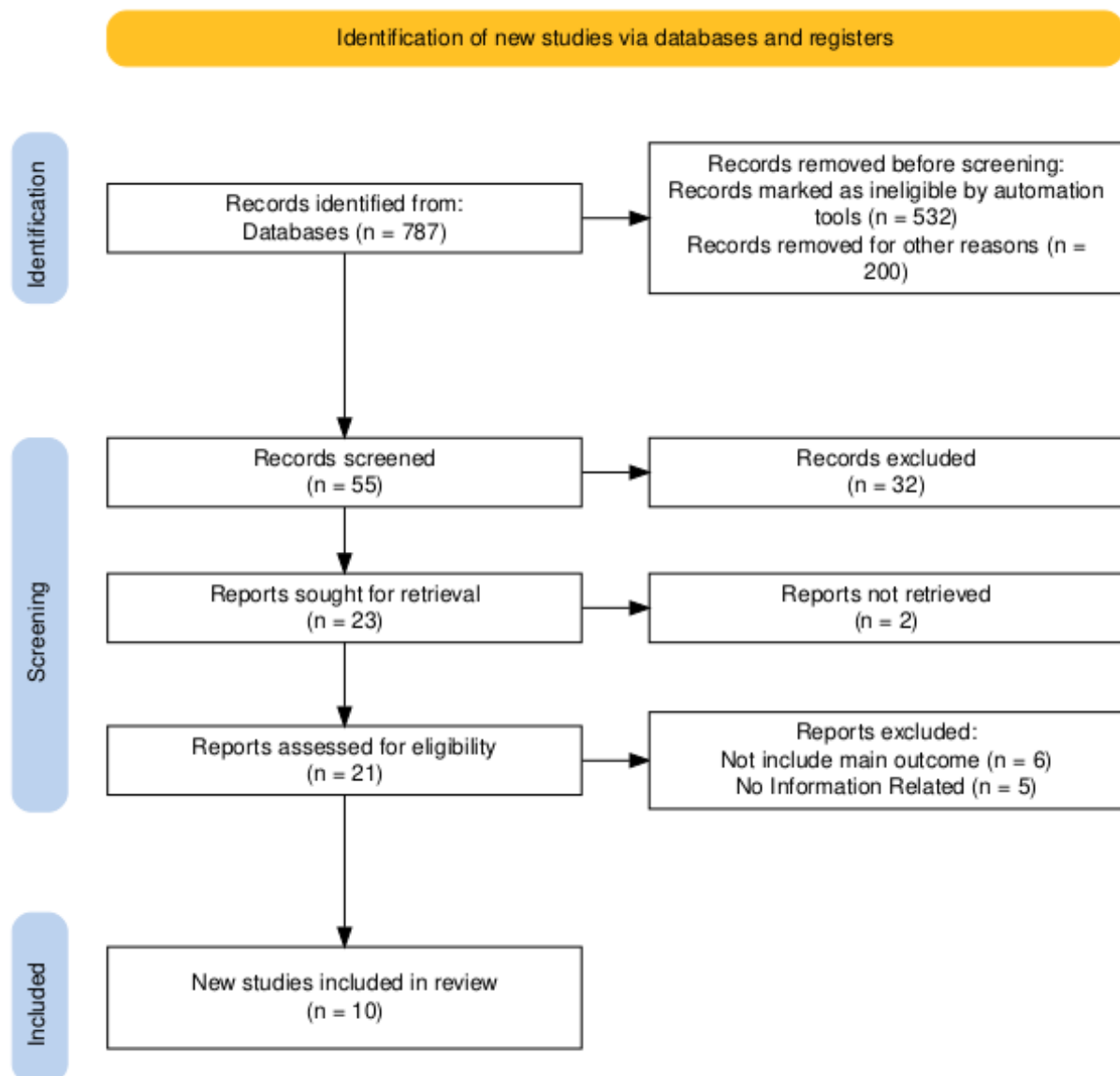


Figure 1 PRISMA flowchart

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The literature search process resulted in 787 articles relevant to the keywords used. After screening based on exclusion criteria, 532 articles were eliminated because they did not meet the requirements for publication year and language. Of the remaining 255 articles, 200 articles were excluded because they were irrelevant or had a scope that did not match the research objectives. Furthermore, 32 articles were rejected after further screening because they did not meet quality standards or inclusion criteria. A total of 21 articles were then evaluated for eligibility, but 6 articles were excluded because they did not cover relevant primary outcomes, and 5 others did not have sufficient information on the relationship between quality of care and length of stay. Finally, 10 articles that met all inclusion criteria were included in this systematic review.

Of the 10 articles analyzed, the majority (6 articles) used a cohort study design, while the other four used a cross-sectional design. These studies cover a variety of geographic and clinical contexts and offer comprehensive data on the relationship between quality of care and length of stay. The findings from this literature provide in-depth insights into factors that influence length of stay in the emergency department, including service efficiency, triage quality, and adherence to clinical guidelines.

A rigorous selection process ensured that only high-quality articles relevant to this topic were included in the analysis, thus providing a high level of validity and reliability for supporting clinical decision-making and health policy.

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Table Details of Research Results

(Author, Year) (Country)	Research Design	Main Outcome	Result
(Mentzoni, et al., 2019) (Norway)	Retrospective study design to analyze data from the hospital electronic information system before and after an increased catchment area	Length of stay in the emergency department and the level of emergency department density after an increased catchment area	The results showed that after an increased catchment area at Akershus University Hospital, the average length of stay in the emergency department increased, from 3 hours 59 minutes in 2010 to 4 hours 17 minutes in 2012, then decreased to 3 hours 45 minutes in 2015 after capacity and organizational adjustments. The level of crowding also increased, from 37.9% in 2010 to 52.9%–77.6% in 2011–2015, with a peak between 4–5 pm. Crowding in the emergency department affects the quality of care and prolongs the length of stay due to resource constraints, which causes delays in patient care. In addition, crowding risks reducing the quality of care and increasing poor patient outcomes.
(Herout, et al., 2023) (Germany)	A retrospective study aimed to identify factors influencing length of hospital stay in patients with symptomatic <i>Ureteral Calculi</i> .	determine significant predictors of length of stay in hospital in patients with <i>Ureteral Calculi</i> undergoing emergency care.	This study found that arterial hypertension was a significant predictor of increased length of stay in patients with <i>Ureteral Calculi</i> undergoing emergency care, with a 1.8-fold higher risk of staying more than 3 days. Longer length of stay is often associated with worse clinical outcomes, which may reflect lower quality of care. In the context of this study, patients admitted on an emergency basis tended to have longer length of stay compared to patients admitted electively, suggesting that quality of care in the emergency setting may influence length of stay.

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(Author, Year) (Country)	Research Design	Main Outcome	Result
(Lee, et al., 2022) (Korea)	Retrospective study design to analyze factors affecting the length of stay of critically ill patients in the emergency department transferred to a regional emergency medical center. Data were collected from medical records of patients referred from other hospitals.	Identify factors that influence the length of stay of critical patients in the emergency department after being transferred from a referral hospital.	The results of the study showed that factors that affect the length of stay of critically ill patients in the emergency department include the number of consultations and communication between the referring and receiving hospitals. The complexity and severity of the patient's condition often require more interaction with specialists, thus prolonging the duration of care. Good quality of care can reduce the patient's length of stay because timely and appropriate care reflects efficiency in handling critically ill patients.
(Alemu, et al., 2019) (Ethiopia)	A cross-sectional design was conducted at Hawassa University Comprehensive Specialized Hospital in Hawassa, Southern Ethiopia.	Identify factors associated with length of stay in the emergency department of Hawassa University Comprehensive Specialized Hospital in Ethiopia.	The results of the study showed that factors such as patient crowding, delay in laboratory diagnosis, shortage of laboratory tests, delay in radiology services, and shortage of inpatient beds significantly contributed to the prolonged Length of Stay in the emergency department of Hawassa University Comprehensive Specialized Hospital in Ethiopia.
(Capuano, et al., 2015) (France)	Retrospective study design to analyze factors influencing length of stay of critically ill patients in the emergency department transferred to a regional emergency medical center	Identify factors that influence the length of stay of critical patients in the emergency department after being transferred from a referral hospital.	The results of the study showed that factors that affect the length of stay of critically ill patients in the emergency department include delays in providing analgesia, poorer adherence to guidelines, and increased risk of short-term mortality. Therefore, better quality of care can help reduce length of stay by ensuring that patients receive timely and standardized care.

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(Author, Year) (Country)	Research Design	Main Outcome	Result
(Zelege, et al., 2024) (Ethiopia)	Cross-sectional research design. This design collects data at one point in time and has limitations in establishing causal relationships.	Assessing the factors that influence the length of stay of pediatric patients in the emergency department of Tikur Anbessa Hospital	The results of the study showed that factors that affect length of stay in pediatric patients in the emergency department include rural residence, urgent triage category, number of investigations performed, and waiting time for diagnostic tests. These factors indicate problems in the efficiency and quality of care provided. This study uses length of stay as a quality indicator to measure the overall efficiency of emergency care.
(Otto, et al., 2022) (Germany)	Retrospective observational design by analyzing data from the German emergency data registry (AKTIN registry). The data used include information from various emergency departments in Germany to evaluate the length of stay as an indicator of quality of care.	Determine the factors that influence length of stay in the emergency department, and identify determinants that can influence the efficiency and quality of service in the emergency department.	This study shows that various factors related to quality of care, such as triage level and patient complaints, can affect length of stay. These factors play a role in improving the efficiency of patient flow and, ultimately, the quality of care provided in the emergency department.
(Negasi, et al., 2022) (Ethiopia)	A cross-sectional design was conducted in the pediatric emergency department of Wolaita Sodo University Teaching and Referral Hospital, Southern Ethiopia. Data were collected from 408 respondents attending the department.	Determine factors related to Length of Stay in pediatric patients in the emergency department	The results of the study indicate that factors such as the inability of professionals to triage correctly, lack of decision-making, and the use of health services such as examinations or laboratory investigations can prolong the length of stay in the emergency department in pediatric patients. These factors reflect aspects of the quality of care that can affect the efficiency and effectiveness of patient care, which ultimately affects the length of stay in the emergency department.

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(Author, Year) (Country)	Research Design	Main Outcome	Result
(Belayneh, et al., 2023) (Ethiopia)	An institution-based cross-sectional study design was conducted in the emergency department of four comprehensive specialty hospitals in the Amhara region of Ethiopia from May 14 to June 15, 2022.	assessing the length of stay of adult patients in the emergency department and factors associated with this length of stay	The results of the study showed that 46.5% of 495 adult patients experienced a length of stay in the emergency department for more than 24 hours, with a median stay of 23.1 hours. Factors such as delays in consultation and crowding, which may indicate problems in the quality of care, were mentioned as factors associated with the length of stay of patients in the emergency department. The results of this study indicate that the quality of care in adult patients can affect the length of stay in the emergency department.
(Becker, et al., 2019) (Israel)	A prospective observational study was conducted at a level 2 trauma center in northern Israel. Data were prospectively collected from stable trauma patients who met the criteria for trauma team activation.	Emergency Department Length of Stay (EDLOS) measurement as an indicator of quality of care. EDLOS is considered an important indicator for assessing the quality of care in the emergency department.	The results showed that although longer EDLOS was associated with higher Injury Severity Score (ISS), there was no significant difference in Hospital Length of Stay (HLOS) between patients with short (less than 2 hours) and long (more than 2 hours) EDLOS in stable trauma patients. This study found no significant differences in diagnostic procedures and care delivery between groups of patients with different EDLOS, indicating that the quality of care provided did not significantly affect EDLOS.

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DISCUSSION

Based on the results in Norway, low quality of care, such as delays in treatment or lack of resources, contributed to an increase in length of stay in the emergency department. Delays in providing intervention have a direct impact on the duration of patient care and increase the risk of clinical complications (Mentzoni, Bogstrand, & Faiz, 2019). This study is in line with the findings in Germany, which revealed that patients with emergency conditions tend to face longer lengths of stay due to the complexity of treatment that requires high speed and accuracy. Delays in various aspects of service, such as the triage process and diagnostic examinations, are the main factors that can worsen the duration of care (Herout, Putz, Borkowetz, Thomas, & Oehlschl ger, 2023). Based on research conducted in the emergency department of a private hospital in Semarang - Indonesia, it was also found that delays in the triage process and laboratory examinations had a significant effect on length of stay. This delay affects the speed in determining the right therapy, thus extending the time needed for patients to get appropriate care (Prasetyowati, Ratnasari, & Victoria, 2023).

Efficiency in service is one of the important aspects that affect the length of stay. Fast and targeted service allows patients to receive therapy according to their needs without delay. Efficiency in service also plays a role in ensuring that hospital resources are used optimally to provide quality care (Lee, Lee, & Kim, 2023). Inefficiencies in the service process such as triage errors or lack of coordination between medical teams can extend the length of stay (Zelege, Nora, Denberu, Adal, & Demisse, 2024). The results of previous studies stated that increasing service efficiency requires a comprehensive approach, including care planning, collaboration between medical teams, and efficient use of resources to reduce the length of stay (Fadhilah & Dhamanti (2024).

Delays in diagnostic services are a major obstacle in patient care in the emergency unit. Delays in radiology or laboratory services often slow down the diagnostic process needed to determine the right therapy (Alemu, Negari, Rodamo, & Hirigo, 2019). Non-compliance with clinical guidelines, such as delays in providing analgesia to patients with acute pain, can prolong hospitalization. The study also

emphasized the importance of complete diagnostic facilities and training of medical personnel to support improving the quality of service (Capuano, Lot, Sagnes-Raffy, Ferrua, Brun-Ney, Leleu, Pateron, Debaty, Giroud, Minvielle, & Riou, 2015). The results of a study in the emergency unit of Akhmad Berahim Tana Tidung Hospital stated that the time of diagnostic examination was a significant factor influencing the length of hospitalization. This further emphasizes that accelerating the diagnostic process is very important to shorten the length of treatment and optimize patient care in the emergency unit (Roselita, Rining, Abiyoga, & Rusdi, 2024). A study at Dr. Soebandi Jember Hospital also found that the time of laboratory examination was the most dominant factor influencing the length of stay of COVID-19 patients in the emergency unit (Wulandari, Andarini, & Suryanto, 2023).

Incorrect or slow triage is often the main cause of increased length of stay, especially in patients with serious conditions. Incorrect triage causes high-priority patients to have to wait longer before receiving the necessary care (Otto, Blaschke, Schirmeister, Drynda, Walcher, & Greiner, 2022). This study is in line with findings in Ethiopia, which showed that in pediatric patients, errors in triage can worsen the length of stay and increase the risk of complications (Negasi, Gonete, Getachew, Assimamaw, & Terefe, 2022). In addition, operational factors such as the patient transfer process also play an important role, as stated by the results of a study at the Emergency Department of Hermina Ciputat Hospital which stated that this process was a dominant factor influencing the length of stay. Accuracy of triage which can reduce patient waiting time is a significant determinant in reducing the length of stay and reducing the risk of complications, so that medical personnel trained in triage are the main focus in patient management in the Emergency Department (Purawijaya, Satar, Andarusito, Hadimuljono, & Ruahedi, 2023).

Operational factors also affect the length of hospitalization, especially in crowded ER conditions. Delays in consultation with specialist doctors and high patient volumes in the ER can slow down the treatment process (Belayneh, Temachu, Messelu, & Gebrie, 2023). This study is supported by the results of previous studies showing that the method of arrival, specialist doctor consultation, final disposition,

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laboratory examinations, and diagnostics are at risk of extending the length of hospitalization of pediatric patients in the ER (Deli, Hasanah, Novayelinda, & Purwanti, 2020). From the results of a study at Bangil Pasuruan Regional Hospital, it was explained that one of the factors that affects the length of hospitalization is the length of consultation time with a specialist doctor. Another factor that affects the length of hospitalization is the length of time for patient transfer (Kristyawan, Nurdiana, & Kapti, 2020). A more organized consultation schedule and service capacity management can reduce patient waiting time (Zelege, Nora, Denberu, Adal, & Demisse, 2024). This statement underlines the importance of effective operational management in improving the efficiency and quality of service.

Patient condition is one of the factors that need to be considered in assessing the relationship between quality of care and length of hospitalization. In stable trauma patients, quality of care does not have a significant effect on length of hospitalization (Becker, Segal, Berlin, & Hershko, 2019). The results of this study indicate that diagnostic procedures and care delivery remain consistent regardless of the length of patient care. This study provides insight that other factors, such as patient characteristics or certain conditions, may play a greater role in determining length of hospitalization. The results of the study at the Emergency Department of Cibinong Hospital also stated that the level of urgency and cases of disease have the potential to be related to length of hospitalization (Wahab, Jak, & Kodyat, 2021).

CONCLUSIONS

The results of the study showed that the quality of care has a significant relationship with the length of stay in the emergency department. There are several factors that can affect the length of stay in the emergency department, which are related to the quality of care provided. First, delays in handling and inaccurate triage processes can extend the length of stay because delays in intervention and patient prioritization worsen the duration of care. Second, service efficiency, including optimal use of hospital resources and good coordination between medical teams, plays an important role in accelerating patient care. Third, delays in diagnostic services, both in laboratory and radiology examinations, slow down the diagnosis and determination of appropriate therapy,

which can extend the length of stay. Fourth, better triage accuracy can reduce patient waiting time, which directly contributes to reducing length of stay and reducing the risk of complications. Fifth, operational factors, such as delays in the consultation process with specialists and patient transfers, can affect the duration of care, which can extend the length of stay. The last, the patient's condition, such as the level of urgency or complexity of the case, can also affect the length of stay, with more serious patients requiring longer for appropriate care. Therefore, improving the quality of care is not only a priority to improve patient clinical outcomes but also an important strategy to increase service efficiency and the sustainability of the health system.

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