

Analysis of emergency department waiting time evidence from a tertiary hospital in Indonesia: A qualitative study

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ABSTRACT

Prolonged waiting times in the Emergency Department caused by high patient volume, limited resources, and operational inefficiencies. This study aims to identify and analyze the factors contributing to waiting times in the Emergency Department. This qualitative descriptive study was conducted over three months (March to May 2025) in the Emergency Department of Prof. Dr. R. D. Kandou General Hospital, Manado. Participants including hospital leadership, emergency physicians, nurses, and the ED head were purposively selected. Data were gathered through semi-structured interviews, direct observations, and patient flow data from the electronic medical records dashboard. Analysis used triangulation to identify patterns and factors influencing waiting times. Emergency Department employs a triage system prioritizing patients by urgency, but faces challenges such as high patient volume, limited staffing and beds, technical issues, and communication delays. Despite efforts to reduce waiting times, critically ill patients often exceed recommended ED stays due to complex care needs. Continuous improvements focus on increasing staff, enhancing infrastructure and information systems, strengthening coordination, and educating the public to optimize patient flow and service quality. Despite effective triage and digital queue systems, persistent staffing, infrastructure, and coordination challenges continue to limit ED efficiency, so improving these areas is essential to enhance performance.

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INTRODUCTION

The quality of healthcare services refers to standardized, evidence-based medical care that ensures patients' rights and obligations are fulfilled while aiming for optimal health outcomes (Nurcahyati et al., 2025; Tandry et al., 2024). High-quality service delivery in hospitals reflects institutional performance and commitment to continuous improvement (Alzoubi et al., 2025). In an increasingly competitive healthcare environment between public and private providers, hospitals must

continuously innovate and improve service quality, patient safety, and operational efficiency to maintain patient satisfaction and trust (Al-Assaf et al., 2024; Mallat et al., 2021).

Delays in healthcare delivery, especially in emergency settings, are not only associated with decreased patient satisfaction but also increased clinical risk. Prolonged waiting times have been linked to delayed treatment initiation, adverse clinical events, and even increased mortality in high-acuity cases (McLean & Thompson, 2023; Mishra & Jain, 2025). Moreover, the timeliness as one of the six core domains of healthcare quality, emphasizing that care must be delivered promptly to avoid harm (Hannawa et al., 2022). Therefore, A comprehensive identification of the root causes of delays, such as inadequate infrastructure and suboptimal workflow processes, is fundamental to improving the overall quality of care in emergency departments (Daly et al., 2021).

Emergency Departments (EDs) play a crucial role in hospital services, especially in public tertiary hospitals (Al-Wathinani et al., 2024). However, increasing patient visits to the ED can lead to overcrowding and prolonged waiting times, particularly during the transition to inpatient wards. Delays are often caused by limited bed availability, human resources, administrative inefficiencies, and medical support systems (Nyawira et al., 2022). The ideal time frame for patient admission to the ward after a decision for hospitalization is 4-6 hours. Exceeding this limit may compromise patient safety, lower service quality, and increase the likelihood of medical errors (Jones et al., 2022). Patient overcrowding and long waiting times also negatively impact satisfaction, particularly when compounded by noisy environments and insufficient staff (Xuan et al., 2021). Such situations often draw criticism from patients, families, and even media, affecting the hospital's public image (Cham et al., 2021).

As a national referral center and one of the 35 vertical hospitals governed by the Ministry of Health, Prof. Dr. R. D. Kandou General Hospital holds a strategic role in providing emergency medical services across Eastern Indonesia. In 2023, the Emergency Department (ED) recorded a total of 31,265 patient visits, averaging 2,605 per month and about 80 to 90 patients daily. From January to November 2024, the ED served 27,865 patients, demonstrating consistently high demand for emergency care. However, performance data from the Medical Services Division revealed that average monthly compliance with national ED waiting time standards was only 37.50% in 2023 and 39.53% in 2024, which is significantly below the national threshold of 80%. This situation highlights the critical importance of healthcare quality and timeliness in emergency settings, where delays can increase clinical risks and reduce patient satisfaction. Given these challenges, this study aims to identify and analyze the underlying factors contributing to prolonged waiting times in the ED of Prof. Dr. R. D. Kandou General Hospital, Manado, and to develop alternative strategies for systemic improvement.

RESEARCH METHOD

This study employed a qualitative descriptive case study design aimed at exploring the factors that influence waiting times in the Emergency Department (ED) of Prof. Dr. R. D. Kandou General Hospital, Manado. The case study method was chosen to allow an in-depth investigation of a complex and contextualized issue within a real-world healthcare setting. The research was conducted over a three-month period, from March to May 2025, in the ED of the aforementioned hospital, which serves as a national referral center in Eastern Indonesia.

The target population included individuals directly involved in emergency service delivery, namely the hospital director, hospital management team members, emergency physicians, nurses, and the head of the Emergency Department. Purposive sampling was employed to select participants based on their relevance, experience, and capacity to provide meaningful insights into the service processes and issues related to waiting times.

Data collection was conducted using three main instruments. First, in-depth interviews were carried out with key informants using semi-structured, open-ended questions to elicit rich and detailed responses. These interviews were audio-recorded and supported by field notes to

ensure comprehensive documentation. Second, direct observations were conducted in the ED to capture the dynamics of patient care, staff workflows, and real-time service delivery, particularly during critical timeframes. Third, quantitative data on patient service flow were obtained from a customized dashboard integrated into the hospital's electronic medical records system. This dashboard enabled the extraction of key time-based indicators, including patient registration time, diagnostic turnaround, and transfer duration from the ED to inpatient wards.

For data analysis, this study applied a triangulation approach, integrating data from interviews, observations, and system documentation to enhance validity and reliability. This method, as defined by Moleong and Denzin, facilitates a deeper understanding of the research subject by cross-verifying data across multiple sources and methods. The analysis focused on identifying recurring patterns and uncovering both systemic and operational factors contributing to extended waiting times. The research process involved several stages, beginning with preparation, including a literature review, development of instruments, and coordination with the hospital. Data collection was then conducted in the field, followed by triangulation and synthesis of findings. Based on the results, the study formulated strategic recommendations aimed at improving waiting time performance in the ED.

Ethical clearance was obtained from the Ethics Committee of Universitas Sam Ratulangi Manado, and all participants provided informed consent prior to participation. Confidentiality and anonymity were strictly maintained, and participants were made aware of their right to withdraw at any time without negative consequences.

RESULTS AND DISCUSSIONS

Results

Prof. Dr. R. D. Kandou General Hospital (RSUP Kandou) is a government-owned tertiary referral hospital located in Manado, North Sulawesi. The hospital serves as both a national referral center and a teaching hospital, affiliated with medical and health sciences institutions for clinical education and research. RSUP Kandou is accredited by the Joint Commission International (JCI), reflecting its compliance with global standards in patient safety and service quality. To support its mission, the hospital continues to upgrade its infrastructure, technology, and workforce capabilities. The vision of RSUP Kandou is to become a high-quality, equitable teaching hospital supported by productive human resources and reliable financial governance.

Interviews with doctors, nurses, and management at the Emergency Department (ED) revealed that the triage system effectively prioritizes patients based on urgency, from critical (red) to non-urgent (green) cases. However, communication challenges with patients' families often extend the triage process, as staff need extra time to explain the priority system and patient placement. While critically ill patients generally receive timely care, their length of stay in the ED frequently exceeds the recommended 4-hour limit due to the complexity of care involving multiple specialties, diagnostic tests, and obtaining family consent. Patients with less urgent conditions face longer waiting times caused by limited human resources, high patient volume, and prioritization of more critical cases.

Several obstacles contribute to delays, including insufficient numbers of doctors and nurses during peak times, limited observation rooms and inpatient beds, and coordination issues with supporting units such as laboratories and radiology. Technical problems, like malfunctioning pneumatic tube systems and a lack of porters, also increase waiting times. The absence of onsite attending physicians and residents complicates decision-making and patient management, causing further delays. Proposed solutions emphasize increasing medical staff, improving information systems and electronic medical records, public education on triage, enhancing referral and inpatient transfer processes, repairing infrastructure, and ensuring the presence of onsite doctors to improve coordination and reduce waiting times in the ED.

The emergency department (ED) nursing staff described the patient flow beginning with registration, triage classification into red, yellow, and green categories, and subsequent handover to the ED doctors for evaluation and care. Despite efforts to meet the target of under 4-hour waiting time, performance remains below 40%, mainly due to resource constraints and high patient volume. Delays often result from limited inpatient bed availability, requiring patients to wait prolonged periods in the ED or boarding areas, compounded by damaged inpatient facilities and insufficient transport personnel. Additionally, slow laboratory and radiology turnaround times, incomplete electronic medical records due to limited computer availability and system issues, and shortage of ambulances contribute to extended waiting times. The workload on nurses is heavy, managing numerous patients with varying severity while performing clinical care, documentation, and communication tasks. To improve efficiency, nurses emphasize increasing staffing, enhancing infrastructure and inpatient capacity, optimizing information technology, conducting regular training on triage and communication, and educating the public on ED processes and prioritization to reduce misunderstandings and complaints.

The management of RSUP Prof. Dr. R. D. Kandou explained that the Emergency Department (ED) follows a systematic service flow starting from patient registration, triage using color-coded priority categories, medical examination, to referral or discharge. Waiting times are regularly monitored with a focus on rapid treatment for critical cases, but challenges remain for non-critical patients due to patient volume, limited inpatient beds, and supporting facilities. Staffing levels follow national standards with flexible shifts and backup personnel during patient surges, while also emphasizing staff well-being through proper scheduling and psychological support. Although the ED's facilities generally meet standards, equipment breakdowns and space shortages pose challenges, managed by using boarding areas and coordination with referral hospitals. Electronic triage systems are used but sometimes face technical and hardware limitations, affecting waiting times. Internal factors like bed availability and staffing, along with external factors such as referral systems and patients' social conditions, influence waiting times. The hospital optimizes services through digital queue systems, ongoing training, and cross-unit collaboration, continuously evaluating quality indicators. Improvement strategies include increasing and upgrading staff skills, strengthening interdepartmental coordination, educating the public, developing integrated dashboards, and enhancing the ED environment for patient and family comfort—all aimed at delivering fast, accurate, and well-coordinated care.

Discussion

The study results directly address the objective of evaluating the Emergency Department (ED) service flow at RSUP Prof. Dr. R. D. Kandou by highlighting both strengths and challenges within the system. The triage mechanism effectively prioritizes patients based on medical urgency, ensuring that critically ill patients receive prompt attention. This outcome aligns well with the hospital's protocols and the global standards for emergency care, showing the importance of structured triage in managing patient flow efficiently. However, despite this prioritization, the overall waiting times (especially for non-critical patients) remain prolonged. This is primarily due to constraints in human resources, limited inpatient beds, diagnostic delays, and infrastructural challenges, which collectively create bottlenecks in the service process (Chaudhary et al., 2025; Simion Luduşanu et al., 2025).

Scientifically, the effective triage system works because it applies objective classification criteria that allow swift identification and treatment of critical cases, consistent with international emergency medicine guidelines (Napi et al., 2019; Zachariasse et al., 2019). On the other hand, delays caused by insufficient staff numbers during peak hours, malfunctioning electronic medical record systems, and coordination difficulties among departments reveal the complex interplay of organizational and technical factors that affect patient throughput (Janett & Yeracaris, 2020; Troyer & Brady, 2020; Wretborn et al., 2019). In addition, The psychosocial dimensions of nurse workload that affect communication, documentation, and decision-making in stressful ED situations include

emotional exhaustion, time pressure, cognitive overload, interpersonal conflicts, and lack of support, all of which can impair focus, clarity, and responsiveness during critical care delivery. The extended stay of critical patients beyond recommended time frames is often linked to the complexity of care requiring multi-specialty involvement and the need for family consent, which emphasizes the critical role of communication and administrative processes in emergency care (AlOmari, 2022; Persis et al., 2022). These findings underscore the necessity of enhancing not only staffing and infrastructure but also communication training and information system reliability.

The observations from RSUP Kandou correspond closely with existing literature reporting similar challenges in emergency departments worldwide, such as overcrowding, staff shortages, and infrastructural limitations. Communication difficulties and delays in family consent have also been documented as significant contributors to prolonged ED stays, reinforcing the need for clear and empathetic communication strategies in emergency settings. Furthermore, the impact of staff well-being and motivation on service quality found in this study resonates with Herzberg's motivational theory and aligns with findings that emphasize the correlation between workforce management and patient care performance (Hoxha et al., 2024). Compared to well-resourced institutions, the challenges with electronic medical records and facility maintenance at RSUP Kandou illustrate the disparities faced by hospitals in resource-constrained environments, highlighting the importance of tailored strategies for these contexts. The hospital's approach to strengthening referral coordination and flexible staffing during patient surges is consistent with global best practices aimed at mitigating ED congestion, particularly relevant in low- and middle-income countries (Alenezi et al., 2021; PSBI Formative Research Study Group, 2022).

The findings confirm that while a structured triage system and digital queue management significantly improve prioritization and care for critical patients, multifactorial challenges such as resource limitations, infrastructural issues, communication barriers, and coordination gaps continue to hinder overall efficiency. Addressing these challenges through comprehensive strategies encompassing human resources, technology, interdepartmental collaboration, and patient-family education is essential to improve emergency care delivery (Srijithesh et al., 2025). This study not only offers context-specific insights for RSUP Kandou but also reflects broader patterns observed in emergency medicine globally, contributing to the ongoing discourse on optimizing ED performance under varying resource conditions.

CONCLUSION

In summary, the study confirms that a systematic triage protocol and digital queue management can improve prioritization of critical patients, yet multifactorial challenges continue to affect overall ED efficiency. Addressing human resources, infrastructure, communication, and inter-institutional coordination remains essential. These insights contribute valuable context-specific knowledge while reaffirming themes widely observed in emergency care research globally. The results of this study can inform the development of context-sensitive quality indicators for emergency department services by incorporating variables such as inter-facility coordination, patient education levels, and infrastructure readiness into performance measurement frameworks. The implementation of systematic triage and digital queue management improves prioritization of critical patients, but overall emergency department efficiency remains hindered by challenges in human resources, infrastructure, communication, and inter-facility coordination. Therefore, the Ministry of Health should establish national guidelines that include triage standards, digital queue systems, and comprehensive support for enabling factors.

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