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# Phenomenological Study on Workflow Efficiency and Response Time in Emergency Obstetric and Neonatal Care

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**ABSTRACT** Indonesia continues to face a high maternal mortality ratio, with delays in emergency obstetric care at referral hospitals remaining a critical contributor, despite the implementation of Comprehensive Emergency Obstetric and Neonatal Care (PONEK) services. These delays are frequently associated with inefficiencies in workflow and response time, particularly during post-triage management. This study aimed to explore healthcare workers' lived experiences and to identify organizational, procedural, and systemic factors influencing workflow efficiency and response time in PONEK services at Y Hospital, Jakarta, a teaching hospital, referral center, and certified Syariah-based institution. A qualitative descriptive phenomenological design was employed, involving 15 purposively selected participants consisting of obstetricians, emergency physicians, midwives, nurses, administrative staff, and hospital managers directly engaged in PONEK services. Data were collected through in-depth interviews, non-participant observations, focus group discussions, and document review, and were analyzed using thematic analysis supported by content and SWOT analyses to ensure analytical rigor and triangulation. The findings revealed that while triage response time consistently met international standards of less than five minutes, significant delays occurred in subsequent stages of care due to fragmented inter-unit coordination, reliance on informal communication, inconsistent implementation of Standard Operating Procedures, and suboptimal utilization of the Hospital Management Information System (SIMRS). Additional barriers included incomplete referral documentation and the presence of non-emergency cases within the PONEK pathway, which disrupted prioritization and prolonged patient length of stay. In conclusion, workflow inefficiencies in PONEK services at Y Hospital are primarily driven by coordination gaps, human resource limitations, and insufficient digital integration rather than infrastructural shortcomings. Strengthening cross-unit collaboration, improving referral accuracy, enhancing staff capacity through continuous training, and optimizing digital systems are essential strategies to improve response time, service quality, and maternal emergency outcomes, thereby supporting hospital performance and contributing to the achievement of Sustainable Development Goal 3.1 on maternal mortality reduction.

**INDEX TERMS** Emergency Obstetric Care, Workflow Efficiency, Response Time, Phenomenological Study, Health System Coordination.

## I. INTRODUCTION

Maternal mortality remains a critical indicator of health system quality, accessibility, and responsiveness. Despite global progress, low- and middle-income countries continue to account for more than 90% of maternal deaths, most of which are preventable through timely and effective emergency obstetric care [1], [2]. In Indonesia, maternal mortality remains above the Sustainable Development Goal (SDG) 3.1 target, reflecting persistent challenges in emergency service delivery at referral hospitals [3]. Evidence indicates that a substantial proportion of maternal deaths occur due to delays within health facilities, particularly during emergency obstetric management that requires rapid decision-making and coordinated multidisciplinary action [4], [5].

To reduce maternal and neonatal mortality, the Indonesian government has implemented the Comprehensive Emergency Obstetric and Neonatal Care (PONEK) program at referral hospitals. This program mandates 24-hour service readiness, standardized triage systems, integrated referral pathways, and interprofessional collaboration to ensure timely emergency response [6]. At the global level, state-of-the-art emergency obstetric care emphasizes workflow optimization, structured triage protocols, team-based emergency response models, and digital health integration

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to improve response time and clinical outcomes [7]–[9]. Recent studies demonstrate that efficient clinical workflows and strong coordination between emergency units, obstetric services, laboratories, and operating theaters are strongly associated with reduced delays and improved maternal outcomes [10], [11].

However, emerging evidence also highlights that the availability of infrastructure and clinical guidelines alone does not guarantee effective emergency response. Organizational factors such as fragmented communication, unclear role delineation, and limited utilization of digital information systems frequently undermine workflow efficiency and prolong response time [12], [13]. Studies conducted in referral hospitals across low- and middle-income settings show that weaknesses in inter-unit coordination and real-time information exchange remain major barriers to optimal emergency obstetric care, even in well-resourced facilities [14], [15].

Despite the growing literature on emergency obstetric services, most existing studies rely predominantly on quantitative indicators, including response time compliance, case fatality rates, or availability of emergency signal functions [16], [17]. There is a notable lack of qualitative research exploring how healthcare workers experience and navigate emergency workflows in daily practice, particularly within PONEK services in Indonesia. Furthermore, limited attention has been given to examining how organizational dynamics, communication patterns, and digital system use interact to shape workflow efficiency and response time in complex hospital environments [18]. This gap is particularly evident in referral hospitals that simultaneously function as teaching institutions and faith-based organizations, where additional organizational values and governance structures may influence service delivery [19].

Accordingly, a clear research gap exists in understanding the lived experiences of healthcare workers and the systemic factors influencing workflow efficiency and response time within PONEK services. Addressing this gap is essential to inform evidence-based and context-sensitive strategies that move beyond structural readiness toward sustainable improvements in emergency obstetric care performance.

Therefore, this study aims to explore healthcare workers' lived experiences in implementing PONEK services at a tertiary referral hospital in Jakarta, with a specific focus on identifying organizational, procedural, and systemic factors affecting workflow efficiency and response time in emergency obstetric and neonatal care.

This study makes three key contributions. First, it provides in-depth qualitative evidence on workflow efficiency and response time within PONEK services, complementing existing quantitative performance-based studies. Second, it identifies critical organizational and coordination-related barriers that hinder optimal emergency response, offering actionable insights for hospital management and policymakers. Third, it contributes to health system strengthening by proposing improvement strategies aligned with global quality-of-care frameworks and national maternal health priorities [20].

The remainder of this article is organized as follows: Section II describes the research methodology, Section III presents the study findings, Section IV discusses the results in relation to existing literature, and Section V concludes with key implications, limitations, and recommendations for future research.

## II. METHODS

### A. STUDY DESIGN

This study employed a qualitative research design with a phenomenological approach to explore healthcare workers' lived experiences in implementing Comprehensive Emergency Obstetric and Neonatal Care (PONEK) services. A qualitative phenomenological design was selected to capture in-depth perspectives on workflow efficiency, response time, and organizational dynamics that cannot be adequately explained through quantitative indicators alone [21]. The study was conducted as a prospective investigation, with data collected directly from participants during the study period. No experimental intervention or randomization was applied, as the objective was to understand naturally occurring practices within routine service delivery.

### B. STUDY SETTING

The study was conducted at a tertiary referral hospital in Jakarta, Indonesia, which has been officially designated as a PONEK hospital by the Ministry of Health. The hospital provides 24-hour emergency obstetric and neonatal services and functions as both a referral center and a teaching hospital. PONEK services at this facility involve multidisciplinary collaboration across emergency units, obstetric and gynecology departments, neonatal units, laboratories, operating theaters, and hospital management. The setting was selected due to its high volume of obstetric emergency cases and its complex organizational structure, which is suitable for examining workflow efficiency and response time in emergency care.

### C. STUDY POPULATION AND SAMPLING

The study population consisted of healthcare workers directly involved in the delivery and coordination of PONEK services. Participants included obstetricians, midwives, nurses, anesthetists, emergency physicians, and hospital administrators responsible for service coordination. A purposive sampling technique was used to select participants based on predefined inclusion criteria: (1) having at least one year of experience working in PONEK services, (2) being actively involved in emergency obstetric or neonatal care, and (3) willingness to participate in the study. Participants who were on extended leave or not directly involved in emergency care were excluded. Sampling continued until data saturation was achieved, defined as the point at which no new themes emerged from successive interviews [22].

### D. DATA COLLECTION PROCEDURES

Data were collected through in-depth, semi-structured interviews conducted between March and June 2024. An interview guide was developed based on existing literature on emergency obstetric care, workflow efficiency, and

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response time indicators [23], [24]. The guide covered key domains including emergency response procedures, inter-unit coordination, communication mechanisms, use of information systems, perceived barriers, and improvement strategies. Interviews were conducted in a private setting within the hospital to ensure confidentiality and lasted between 45 and 60 minutes. All interviews were audio-recorded with participants' consent and transcribed verbatim for analysis. Field notes were taken to document contextual observations and non-verbal cues relevant to workflow processes.

### *E. DATA ANALYSIS*

Data analysis was performed using thematic analysis following a systematic, stepwise procedure. Transcripts were read repeatedly to ensure familiarization with the data. Initial codes were generated inductively and grouped into categories reflecting workflow efficiency, response time, organizational factors, and system-level challenges. Themes were reviewed and refined through iterative comparison across transcripts to ensure consistency and credibility [25]. To enhance analytical rigor, two researchers independently coded the data and resolved discrepancies through discussion. NVivo software (version 12) was used to support data management and coding.

### *F. TRUSTWORTHINESS AND RIGOR*

The trustworthiness of the study was ensured through established qualitative rigor criteria, including credibility, dependability, confirmability, and transferability [26]. Credibility was enhanced through prolonged engagement with participants and member checking, whereby selected participants reviewed summarized findings for accuracy. Dependability was ensured by maintaining a detailed audit trail of methodological decisions. Confirmability was addressed by reflexive journaling to minimize researcher bias. Transferability was supported by providing a detailed description of the study context and participant characteristics.

### *G. ETHICAL CONSIDERATIONS*

Ethical approval was obtained from the Institutional Review Board of the study hospital. All participants received written and verbal information regarding the study objectives, procedures, risks, and benefits. Written informed consent was obtained prior to data collection. Participant anonymity and confidentiality were strictly maintained by assigning unique identification codes and securely storing all data. The study adhered to international ethical guidelines for research involving human participants [27], [28].

## III. RESULTS

This study identified five main themes that illustrate workflow efficiency, response timeliness, and coordination within the Comprehensive Emergency Obstetric and Neonatal Care (PONEK) system at Y Hospital, Jakarta, which has been officially designated as a Hospital Coach by the Jakarta Provincial Government and serves as a nationally accredited Syariah Hospital. This dual status positions Y Hospital as a model institution for developing high-quality, comprehensive care that integrates professional standards, ethical conduct, and Syariah principles in hospital management. Data were obtained through direct observation, in-depth interviews with healthcare professionals, focus group discussions (FGDs), and a review of institutional documents. The findings are presented based on patterns that emerged from the lived experiences of informants, without the use of theoretical interpretation.

**TABLE 1**
**Number of Research Informants**

| No. | Informant | Number |
|---|---|---|
| **TRIANGULATION INFORMANTS** | | |
| 1 | Director of Medical Services | 1 person |
| 2 | Medical Service Management | 1 person |
| 3 | Nursing Management | 1 person |
| 4 | Supervisor of Emergency Department (ED) | 1 person |
| 5 | Midwifery Supervisor | 1 person |
| 6 | Head of PONEK and Coordinator of Obstetrics and Gynecology Division at **Hospital Y** | 1 person |
| **PRIMARY INFORMANTS** | | |
| 7 | Obstetrics and Gynecology Specialist at **Hospital Y** | 1 person |
| 8 | Emergency Physician at **Hospital Y** | 1 person |
| 9 | Midwives or Nurses assigned to PONEK at **Hospital Y** | 6 persons |
| 10 | Administrative Staff assigned to PONEK at **Hospital Y** | 1 person |
| **Total Informants** | | 15 person |

**Source:** Hospital Y Service Guidelines, 2022

**TABLE 2**
**Average Time to Manage PONEK Patients**

| No | Theme | Key Findings | Supporting Data Source |
|---|---|---|---|
| 1 | Response Time Optimization | Rapid triage, but follow-up actions often delayed due to inter-unit coordination gaps. | Observation, interviews |
| 2 | Process Efficiency and SOP Implementation | SOPs are comprehensive and accessible, yet execution varies across shifts. | Documents, FGD |
| 3 | False Emergencies and Referral Gaps | Some patients arrive without referral and do not meet emergency criteria. | Observation, interviews |
| 4 | Digital System Integration | Digital systems function well, but incomplete or unregistered patient data remain a challenge. | Interviews, documents |
| 5 | Improvement Strategies | Five strategic actions agreed upon through FGD to strengthen integration and accelerate response. | FGD, documents |

### 1. Optimizing Response Time

Observations revealed that triage processes at the emergency unit were generally fast and accurate. The medical team demonstrated strong capability in recognizing obstetric emergencies and prioritizing immediate care. However, after the triage stage, follow-up actions were frequently delayed due to communication and coordination barriers between departments, particularly

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TABLE 3
Clinical descriptors and example cases

| ATS Category | Response time target | Clinical description (summary) | Typical vital-sign / clinical examples | Representative example case |
|---|---|---|---|---|
| **Category 1 — Immediate** | Immediate — treatment/ assessment **now** | Imminently life-threatening condition or organ failure that requires immediate intervention. | Apnoea or RR < 10/min; no palpable central pulse; GCS < 8; severe respiratory distress or profound hypotension. | Cardiac arrest on arrival; maternal cardiac arrest in labour requiring immediate resuscitation. |
| **Category 2 — Emergency** | Within **10 minutes** | Potentially life-threatening or time-critical condition that may deteriorate rapidly. | Severe respiratory distress, chest pain with ischemic signs, weak carotid/peripheral pulses, GCS 9–12. | Eclampsia with ongoing seizures; severe postpartum hemorrhage with ongoing significant bleeding but still perfusing. |
| **Category 3 — Urgent** | Within **30 minutes** | Potentially life-threatening if not treated within a short period; moderate acuity requiring urgent assessment. | RR 24–40/min, HR moderately abnormal, moderate retractions (children), GCS 13–14, moderate pain (score 4–6). | Pre-eclampsia with high BP requiring urgent stabilization and investigations (e.g., CTG, labs). |
| **Category 4 — Semi-urgent** | Within **60 minutes** | Conditions that require assessment and treatment but are not expected to deteriorate rapidly. | Mildly abnormal vitals (e.g., RR 21–23/min), stable perfusion, alert mental status, mild pain. | Routine postoperative wound check with mild fever; low-risk vaginal bleeding without hemodynamic compromise. |
| **Category 5 — Non-urgent** | Within **120 minutes (or per local policy)** | Minor conditions; clinical risk is low and delay is unlikely to cause harm. | Normal vital signs, alert, no severe pain or functional impairment. | Routine antenatal check-in with minor concerns (e.g., mild back pain), simple prescription refill. |

**Source** : Australasian Triage Scale (ATS)

**Notes:**
Time targets and clinical descriptors above are condensed summaries of the Australasian Triage Scale and related implementation guidance; local ED policies may define exact time windows and destination areas (e.g., resuscitation bay, short-stay unit). acem.org.au+1

2. The WHO Emergency Care framework identifies triage as an essential ED function and supports adaptation of standard triage tools to local contexts, especially for maternal and neonatal emergencies. World Health Organization+1

among the emergency room, delivery suite, and operating theater. Several healthcare workers noted that prioritization of interventions often depended on manual confirmation from the responsible physician, which extended the overall response time.

**a. Strengths in Triage.**

"Triage response time is already fast, and we have achieved the <5-minute target. We follow the international standard, the Australian Triage Scale. The triage team is assigned based on their competencies. From the triage results, patients are directed to the appropriate unit observation, physiological labor, or outpatient not all to the PONEK unit. Our hope is to optimize patient care time." (*Key Informant, March 2025*)

**b. Challenges in Follow-up Services**

1. **External Factors** "Triage is fast, but non-referral patients often arrive without medical data, so we need time to perform CTG, lab tests, and confirmation with the attending physician (DPJP)." (*Key Informant, March 2025*)
2. **Communication Barriers** "Most specialists are already part of the referral group, and we have a reporting format that enables faster communication. However, some doctors are still slow to respond, so we have to wait for their confirmation. Our policy is to attempt to contact the doctor three times at 15-minute intervals. If there's no response, we escalate the case to the next on-duty doctor."(*Key Informant, March 2025*)
3. **Coordination Barriers** "There are cases where patients who are ready to be transferred cannot be moved because the receiving unit still requires certain requests to be fulfilled. However, our role in PONEK is to stabilize the emergency; once resolved, the patient should be transferred to the appropriate treatment or follow-up care unit." (*Key Informant 9, March 2025*)
4. **Non-Compliance with SOPs** "*There was an incident where a patient required an emergency (cito) blood test, but the lab staff was busy attending to another patient. Although we have a policy for emergency blood testing, there should be a standby officer." (Key Informant, March 2025) "There are regulations regarding support personnel, but implementation has not been optimal."(Key Informant, March 2025)*
5. **Poor Coordination and Communication Causing Prolonged Length of Stay (LOS)** *"LOS differs in every hospital depending on their readiness to accept patients. At RS Y emergency department, the standard LOS is 3 hours, but we still find cases where LOS exceeds this target."(Key Informant, March 2025)*

**Table Findings (Excerpted from observation and document review, N = 558 patients)**

1. 66 patients did not meet PONEK criteria
2. 93 patients experienced delays > 3 hours in the Non-SC category
3. 27 urgent SC cases took > 3 hours
4. 4 emergency SC cases required > 30 minutes

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TABLE 4
Average Time to Manage PONEK Patients

| Month / Patient | Criteria Non Emergency PONEK | Total Pasien (Kriteria PONEK) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Non SC Urgency / To VK | | | SC Urgency | | | SC Emergency | |
| | | < 2 Hours | > 2 Hours | **> 3 Hours** | < 75-120 Hours | > 75-120 hours | **> 3 Hours** | < 30 Minute | **> 30 Minute** |
| January / 110 people | 9 | 37 | 22 | **12** | 21 | 4 | **2** | 2 | **1** |
| Februari / 95 people | 15 | 21 | 14 | **21** | 17 | 1 | **4** | 2 | **0** |
| March / 144 people | 17 | 40 | 22 | **28** | 18 | 9 | **6** | 2 | **2** |
| April / 159 people | 13 | 35 | 28 | **28** | 34 | 8 | **7** | 6 | **0** |
| Until 10 Mei / 50 people | 12 | 10 | 7 | **4** | 8 | 5 | **1** | 2 | **1** |
| TOTAl : 558 people | 66 | 142 | 93 | **93** | 98 | 27 | **20** | 14 | **4** |

**Source:** Observation and document review

**2. Process Efficiency and SOP Implementation**
Y Hospital has comprehensive SOPs aligned with the National Hospital Accreditation Standards (SNARS) and has adopted an international triage protocol, such as the Australian Triage Scale (ATS). However, the implementation stage remains problematic. All Standard Operating Procedures (SOPs) related to PONEK were found to be available and compliant with national accreditation standards. Process flow charts, triage forms, and emergency care guidelines were well-documented and easily accessible. Nevertheless, implementation consistency varied across work shifts. Under high workload conditions, staff members tended to adjust the procedures pragmatically, resulting in variation in service delivery. Overlapping responsibilities between units and the absence of a real-time monitoring mechanism for SOP adherence were identified as key constraints. Staff reported that in some cases, manual coordination was still required to mobilize cross-unit responses.

**Research Findings**
**1. Findings from Healthcare Staff Interviews**
**a. Availability of Service Flow Diagrams** : *"There are already diagrams of the service flow and triage displayed at every strategic corner, so staff can read them at any time." (Key Informant, March 2025)*
**b. Evidence of Service Flow Efficiency** : *"The efficiency of the service flow greatly affects the response time. If the service flow is carried out properly and in accordance with the standard, the expected response time can be achieved." (Key Informant, March 2025)*
**c. Barriers in Service Flow Implementation** :*"The greatest challenge is when multiple patients arrive at the same time and all require urgent care, yet only one midwife is on duty. Sometimes we feel overwhelmed. If inter-unit coordination and communication ran more smoothly, such as through a clear support flow, we would feel more supported. (Key Informant, March 2025)*
**2. Document Observation Findings :** The document review revealed that the required administrative records were complete and aligned with existing standards.
**3. Management Clarification Regarding Documentation.** *"All required documents have been prepared in accordance with established standards. We also passed accreditation, during which the surveyor team thoroughly reviewed our documents. Our documents, including SOPs, are complete and comply with accreditation standards."(Triangulation Informant,March 2025)*
**4. Follow-up Observations on Staff Behavior :** Despite the presence of SOPs and complete documentation, operational delays were still observed. These delays were attributed to a lack of coordination and communication between units, as well as non-compliance with established service flow procedures.
**5. Management Clarification Regarding Staff Behavior :** *"We will conduct monitoring and evaluation of the operational team to address this issue."(Triangulation Informant, March 2025)*

**3. False Emergencies and Referral Gaps**
Findings from observation and interviews indicated that a proportion of patients presenting to the PONEK unit did not meet the criteria for obstetric emergencies. Many arrived without referral letters, antenatal records, or identification documents, and some presented with non-critical conditions that could have been managed at primary care facilities. This situation increased the workload of triage staff and delayed the management of genuinely critical cases. Staff members also reported that certain referrals from primary healthcare centers were inappropriate, such as patients sent without stabilization or with incomplete medical information, further complicating case prioritization at the hospital level.

**Research Findings:**
*"Patients arriving without a referral differ from those with one. Non-referred patients often come without any data; in fact, some have never undergone antenatal check-ups, meaning there is no available health information, and the patient is unaware of their pregnancy condition." (Key Informant, March 2025). "There have been cases where*

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*referred patients arrived with an emergency referral letter, but upon reassessment at the hospital, it turned out to be a false or non-emergency." (Key Informant, March 2025).*

**4. Digital System Integration**

The hospital's digital systems were generally well-functioning and served as the primary medium for interdepartmental coordination. The Hospital Management Information System (SIMRS), online referral platform, and dashboard monitoring were actively used to support reporting and communication. The main barrier did not originate from the system itself but from incomplete patient data—particularly in non-referred cases or those not pre-registered in the system. In such cases, manual data entry or confirmation via messaging was required, leading to minor delays in documentation and verification. Despite these issues, most healthcare workers acknowledged that digital integration significantly improved internal coordination and reduced communication errors. "The hospital system isn't fully real-time yet. We still have to confirm things via chat."*(GP, March 2025)*

**5. Improvement Strategies: System Integration and Collective Emergency Response**

Through FGDs and document analysis, five key strategies were formulated to improve response time and overall PONEK efficiency:

1. Simplify service flow by revising SOPs with a *fast-track* approach for critical obstetric emergencies.
2. Conduct regular triage training and simulation exercises for all healthcare providers involved.
3. Develop an integrated *Early Warning System* to enable rapid identification of potential complications.
4. Establish a cross-unit rapid response team with dedicated communication channels and clear task allocation.
5. Integrate SIMRS with an automated notification system to ensure real-time access to patient status and test results.

These strategies aim to strengthen inter-unit collaboration, accelerate communication, and ensure that all personnel have simultaneous access to updated patient information throughout the care process.

**Summary**

Overall, the findings demonstrate that response efficiency at Y Hospital is satisfactory during the triage phase but remains challenged by coordination gaps and fragmented patient data. The main constraints stem from human and communication factors rather than infrastructure or digital systems. The proposed improvement strategies are expected to enhance cross-unit integration, accelerate clinical decision-making, and reinforce the hospital's readiness in managing obstetric emergencies within the framework of Sharia-compliant healthcare services.

## IV. DISCUSSION

### *A. Workflow Efficiency and Response Time in Emergency Obstetric Care*

The present study demonstrates that response time performance in Y Hospital's PONEK services is optimal at the triage stage but becomes progressively less efficient during subsequent phases of emergency management. The triage team consistently achieved the international benchmark of less than five minutes using the Australian Triage Scale, indicating adequate clinical competence and preparedness at the point of entry. However, delays were frequently observed after triage, particularly during diagnostic confirmation, inter-unit transfer, and initiation of definitive obstetric interventions. These findings suggest that rapid triage alone is insufficient to guarantee timely emergency care if downstream processes are not equally synchronized.

From a health systems perspective, these delays correspond to the third delay in Thaddeus and Maine's Three Delays Model, namely delays in receiving appropriate care after reaching a health facility. While Y Hospital has fulfilled structural readiness requirements such as availability of trained personnel, equipment, and PONEK protocols the process dimension remains fragmented. This misalignment between structural capacity and operational execution highlights that emergency responsiveness is fundamentally a system-level attribute rather than an individual performance outcome.

Comparable findings have been reported in other low- and middle-income countries (LMICs). Recent qualitative studies in Ghana, Tanzania, and India show that although emergency obstetric triage is often performed efficiently, delays frequently occur due to poor coordination between emergency departments, obstetric units, laboratories, and operating theaters [29], [30]. Kruk et al. emphasized that maternal survival depends not only on the presence of emergency services but also on the timeliness and continuity of care across units [31]. In this context, the findings of the present study reinforce the argument that response time should be conceptualized as a continuum rather than a single indicator measured at triage.

The prolonged length of stay (LOS) observed in non-cesarean and cesarean cases further supports this interpretation. Delays were primarily attributed to sequential rather than parallel workflows, reliance on manual confirmation by attending physicians, and variability in unit readiness to receive patients. Similar workflow inefficiencies have been documented in referral hospitals in Kenya and Nigeria, where lack of standardized escalation pathways resulted in prolonged emergency handling despite adequate staffing [32].

The implications of these findings are substantial. Delays occurring after triage may increase the risk of maternal and neonatal complications, particularly in time-sensitive conditions such as postpartum hemorrhage, eclampsia, and fetal distress. Therefore, improving response time requires a shift from unit-based efficiency toward integrated, team-based emergency response models. Establishing parallel workflows, clear accountability chains, and rapid escalation mechanisms could significantly reduce post-triage delays and enhance overall emergency responsiveness.

### *B. Process Implementation, SOP Adherence, and Referral Accuracy*

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This study identified a notable discrepancy between the availability of Standard Operating Procedures (SOPs) and their consistent implementation in daily practice. Although Y Hospital possesses comprehensive SOPs aligned with national accreditation standards and international triage protocols, adherence varied across shifts and workload conditions. In high-demand situations, staff frequently adapted procedures pragmatically, leading to deviations from established service flows. These findings indicate that the existence of SOPs alone does not ensure process reliability.

Using Donabedian's Structure–Process–Outcome framework, this gap reflects a breakdown at the process level, where standardized inputs fail to translate into consistent clinical actions. Similar challenges have been reported in Nepal and Bangladesh, where emergency obstetric SOPs were available but inconsistently applied due to unclear role delineation and limited supervisory mechanisms [33], [34]. Lean healthcare literature also identifies waiting time, handoff delays, and unclear task ownership as major sources of inefficiency in emergency workflows [35].

Another critical barrier identified in this study was the high proportion of patients presenting to the PONEK unit without meeting emergency criteria. Non-referred patients and false emergency referrals increased triage workload and disrupted prioritization of genuinely critical cases. Incomplete referral documentation and lack of antenatal records further prolonged assessment and decision-making. These findings are consistent with studies in Uganda and Ethiopia, which reported that 20–35% of obstetric referrals were inappropriate or non-urgent, primarily due to limited diagnostic capacity and risk assessment skills at primary care facilities [36], [37].

Referral inaccuracy not only strains hospital resources but also undermines emergency responsiveness. When emergency units are overwhelmed by non-critical cases, response time for true emergencies inevitably deteriorates. The present findings underscore the importance of strengthening the gatekeeping function of primary healthcare facilities. Implementation of standardized referral checklists, structured communication tools, and mandatory stabilization protocols prior to referral has been shown to improve referral quality and reduce unnecessary emergency admissions [38].

From a policy and managerial perspective, improving SOP adherence and referral accuracy requires continuous training, routine audits, and feedback mechanisms. Simulation-based emergency drills and interprofessional case reviews could enhance procedural consistency and reinforce shared responsibility across units. Moreover, integrating referral quality indicators into hospital performance monitoring may promote accountability and system-wide learning.

### *C. Digital Integration, Systemic Limitations, and Implications for Practice*

The findings indicate that digital systems at Y Hospital, particularly the Hospital Management Information System (SIMRS), have significant potential to support emergency coordination but are not yet fully optimized for real-time clinical decision-making. Although SIMRS and online referral platforms are routinely used for documentation and reporting, staff frequently rely on informal communication channels, such as messaging applications, to confirm patient status, laboratory results, and physician availability. This reliance on parallel manual communication reflects partial digital integration rather than full digital transformation.

From a sociotechnical systems perspective, this situation highlights the interaction between technology, human behavior, and organizational culture. Previous studies in LMIC hospital settings demonstrate that digital health tools improve emergency responsiveness only when they are embedded into clinical workflows and supported by user training and leadership commitment [39], [40]. Without such alignment, digital systems function primarily as administrative tools rather than enablers of rapid clinical coordination.

The present findings align with research from India and Rwanda, where implementation of real-time digital dashboards, automated alerts, and early warning systems significantly reduced response time and clinical errors when combined with change management strategies [41]. In contrast, fragmented digital use, as observed in Y Hospital, limits the system's capacity to support parallel workflows and proactive decision-making.

Despite these challenges, it is important to note that the primary constraints identified in this study are organizational rather than technological. Most delays stem from incomplete data entry, lack of real-time alerts, and limited integration between referral systems and in-hospital platforms. Addressing these issues does not necessarily require substantial financial investment but rather focused system redesign, including automated notifications, standardized digital referral templates, and real-time monitoring dashboards.

This study has several limitations. First, it was conducted in a single tertiary hospital, which may limit generalizability to other settings. Second, as a qualitative study, findings are based on perceptions and experiences that may be influenced by recall bias. However, triangulation through observations, document review, and management interviews was employed to enhance credibility. Future research should adopt multi-center or mixed-method designs to quantify the impact of workflow and digital interventions on response time and maternal outcomes.

Overall, the implications of this study are both theoretical and practical. Theoretically, the findings extend existing health system frameworks by emphasizing organizational responsiveness as a critical mediator between structure, process, and outcomes. Practically, the study provides actionable insights for optimizing PONEK services through improved coordination, referral governance, and digital integration. Strengthening these dimensions is essential for enhancing emergency obstetric care quality and contributing to the reduction of maternal mortality in Indonesia.

## V. CONCLUSIONS

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This study aimed to explore healthcare workers' lived experiences and to identify organizational, procedural, and systemic factors influencing workflow efficiency and response time in Comprehensive Emergency Obstetric and Neonatal Care (PONEK) services at a tertiary referral hospital in Jakarta. The findings indicate that although the hospital demonstrated strong preparedness at the triage stage, with response times consistently meeting the international benchmark of less than five minutes, substantial delays occurred in subsequent phases of care delivery. Observational and document review data involving 558 emergency obstetric cases revealed that 66 patients (11.8%) did not meet PONEK emergency criteria, while 93 non–cesarean section cases and 27 urgent cesarean section cases experienced delays exceeding the standard length of stay of three hours. Additionally, four emergency cesarean section cases required more than 30 minutes to reach definitive intervention, indicating inefficiencies during post-triage coordination. Qualitative findings further demonstrated that these delays were primarily driven by fragmented inter-unit communication, inconsistent adherence to Standard Operating Procedures, reliance on manual confirmation processes, and incomplete referral documentation rather than limitations in infrastructure or clinical capacity. Although the Hospital Management Information System (SIMRS) and digital referral platforms were available and generally functional, their utilization for real-time emergency coordination remained suboptimal, resulting in continued dependence on informal communication channels. The study also identified referral inaccuracies and false emergency presentations as significant contributors to increased workload and prolonged response time, highlighting weaknesses in pre-hospital gatekeeping mechanisms. Collectively, these findings underscore that emergency responsiveness in PONEK services is a systemic issue requiring integrated solutions that extend beyond triage efficiency. Strengthening cross-unit coordination through clearly defined escalation pathways, improving referral accuracy at the primary care level, enhancing continuous training and simulation-based emergency preparedness, and optimizing digital systems for real-time alerts and data integration are essential strategies to improve service performance. For future research, multi-center and mixed-method studies are recommended to quantitatively assess the impact of workflow redesign and digital integration on response time, maternal outcomes, and patient safety indicators. Further investigation into leadership engagement, organizational culture, and change management strategies is also warranted to support sustainable improvements in emergency obstetric care and contribute meaningfully to the achievement of Sustainable Development Goal 3.1 on maternal mortality reduction.

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## DATA AVAILABILITY

All data generated or analyzed during this study are included in this published article.

## AUTHOR CONTRIBUTION

Raden Roro Pratiwi Madya Putri conceptualized the study, designed the research methodology, coordinated data collection, conducted qualitative data analysis, and drafted the original manuscript. Edy Prasetyo and Mia Mariani contributed to the study design, data interpretation, and critical revision of the manuscript for important intellectual content. Nurul Huda and Sri Wuryanti participated in data collection, document review, and validation of the findings through triangulation. Guswan Wiwaha contributed to methodological refinement, data analysis support, and manuscript review. Dicky Budiman provided conceptual guidance, supervised the overall research process, and contributed to the critical review and final approval of the manuscript. All authors read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

## DECLARATIONS

### *ETHICAL APPROVAL*

Ethical approval for this study was obtained from the Institutional Review Board of the study hospital. All participants received detailed information regarding the study objectives and procedures, and written informed consent was obtained prior to data collection. Participant confidentiality and anonymity were strictly maintained throughout the research process.

### *CONSENT FOR PUBLICATION PARTICIPANTS.*

Not applicable.

### *COMPETING INTERESTS*

The authors declare that they have no competing interests.

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