

Challenges of Management of Postpartum Hemorrhage Among Healthcare Providers in Obstetric Care Units in Uniosun Teaching Hospital

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Abstract

Background:

Postpartum hemorrhage (PPH) remains a leading preventable cause of maternal morbidity and mortality in Nigeria, driven by delays in recognition and suboptimal emergency response within health facilities.

Problem Statement:

Despite established guidelines for PPH management, gaps in emergency response time and systemic readiness persist in tertiary care settings, increasing the risk of adverse maternal outcomes.

Methods:

A descriptive cross-sectional study was conducted among 75 healthcare providers (44 nurses and 31 medical officers) at the University of Osun Teaching Hospital, Osogbo. Data were collected using a validated self-administered questionnaire assessing socio-demographic characteristics, emergency response times, and challenges in PPH management. Descriptive statistics were used for analysis.

Results:

Only 24% of respondents initiated intervention within five minutes of PPH onset, while approximately one-third reported delays exceeding 15 minutes. Emergency team mobilization was similarly suboptimal, with just 26.7% achieving activation within five minutes. Major barriers identified included inadequate staffing (69.3%), shortages of essential medications (64%), limited infrastructure (61.3%), poor interdepartmental coordination (54.7%), and infrequent emergency drills (33.3% rarely conducted).

Conclusion:

Delays in emergency response and systemic inefficiencies significantly hinder effective PPH management in this setting. Strengthening emergency preparedness through standardized protocols, improved staffing, continuous training, reliable supply chains, enhanced infrastructure, and routine multidisciplinary drills is critical to reducing preventable maternal morbidity and mortality.

Introduction

Postpartum hemorrhage (PPH) remains one of the leading preventable causes of maternal morbidity and mortality globally, accounting for a substantial proportion of maternal deaths, particularly in low- and middle-income countries. [1, 2] In sub-Saharan Africa, including Nigeria, the burden is disproportionately

high due to delays in recognition, diagnosis, and timely intervention. [3] PPH is characterized by its rapid onset and progression, requiring immediate, coordinated, and skilled clinical response. However, in many tertiary healthcare settings, including the University of Osun Teaching Hospital, Osogbo, persistent gaps in emergency preparedness, provider capacity, and health system readiness continue to compromise effective management, contributing to avoidable maternal near-miss events and deaths. [4]

Existing evidence highlights that effective PPH management depends on early detection, rapid response and adherence to standardized protocols. [5] However, multiple studies have identified key barriers, including reliance on inaccurate visual estimation blood loss, limited use of quantitative measurement tools, and inconsistent application of risk assessment models. [6, 7] Although interventions such as uterotonics and tranexamic acid have demonstrated life-saving potential when administered promptly, their availability and timely use remain suboptimal in many low-resource settings. [8, 9] In addition, procedural interventions such as uterine tamponade and surgical techniques require skilled personnel and institutional preparedness, which are often lacking. [10, 11] Beyond clinical factors, systemic challenges, including inadequate staffing, poor interdepartmental coordination, weak emergency response systems, limited infrastructure, and infrequent simulation drills have been shown to significantly hinder timely and effective PPH management. [12, 13]

Despite growing global and regional evidence on PPH management, there is limited context-specific data on emergency response times and the operational challenges faced by healthcare providers in tertiary facilities in Nigeria, particularly in Osun State. Existing studies have largely focused on clinical outcomes and intervention efficacy, with insufficient attention to real-time response dynamics and health system constraints that influence provider performance during obstetric emergencies. [14, 15] This gap limits the ability to design targeted, context-relevant interventions to improve maternal outcomes. Therefore, this study examined emergency response times and the challenges associated with PPH management among healthcare providers in obstetric care units at the University of Osun Teaching Hospital, Osogbo. Findings from this study will provide critical insights to inform policy, strengthen clinical practice, and enhance emergency preparedness for reducing preventable maternal morbidity and mortality.

Methods and Materials

Study Design and Setting

This study employed a descriptive cross-sectional design to assess emergency response times and challenges in the management of postpartum hemorrhage (PPH) among healthcare providers at the University of Osun Teaching Hospital, Osogbo, Nigeria. This design was appropriate for obtaining a snapshot of current practices, institutional capacity, and barriers without manipulation of study variables.

Study Population and Sampling

The study population comprised healthcare professionals directly involved in the management of PPH and other obstetric emergencies, including nurses and medical officers. A total enumeration sampling technique was used, whereby all eligible and available healthcare providers who met the inclusion criteria during the study period were recruited. In total, 75 respondents participated in the study, including 44 nurses and 31 medical officers.

Inclusion criteria

healthcare providers actively involved in obstetric care and management of PPH who consented to participate.

Exclusion criteria

healthcare providers not directly involved in obstetric care or unavailable during the data collection period.

Data Collection Instrument

Data were collected using a structured, self-administered questionnaire developed by the researcher following a review of relevant literature and standard guidelines on the management of postpartum hemorrhage (PPH). The instrument was designed to assess emergency preparedness for PPH among healthcare providers working in obstetric care units.

The questionnaire consisted of seven sections, each addressing key domains of PPH emergency preparedness:

• Section I: Demographic Information

- Captured respondents' socio-demographic and professional characteristics, including age, gender, profession, job title, and years of experience in maternal healthcare.

• Section II: Facility Preparedness

- Assessed the availability of institutional protocols, essential medications (e.g., oxytocin, misoprostol, tranexamic acid), blood transfusion services, emergency equipment, and the frequency of emergency drills for obstetric complications.

• Section III: Staff Knowledge and Training

- Evaluated respondents' knowledge of PPH management, prior training, confidence in managing PPH cases, and experience in handling obstetric emergencies. This section also included objective knowledge-based questions on first-line interventions and timelines for emergency response.

- **Section IV: Emergency Response Capacity**

- Examined response times, team mobilization efficiency, and factors contributing to delays in initiating care for PPH cases.

- **Section V: Barriers to Emergency Preparedness**

- Identified systemic and institutional challenges, including staffing shortages, inadequate funding, supply chain issues, infrastructure limitations, and interdepartmental coordination.

- **Section VI: Regional Healthcare Challenges**

- Explored referral patterns, inter-facility coordination, availability of specialized care, and the impact of variability in emergency protocols across healthcare facilities.

- **Section VII: Patient-Centered Care**

- Assessed practices related to patient education, risk screening, community engagement, and strategies to improve awareness and early detection of PPH.

The questionnaire included a combination of closed-ended questions (Yes/No, multiple-choice, and Likert-scale responses) and a few open-ended items to capture additional contextual insights. The instrument was designed to be completed within approximately 15–20 minutes.

To ensure clarity and relevance, the questionnaire was reviewed by experts in maternal health and research methodology prior to data collection.

The full questionnaire is provided as **Supplementary File 1**.

Validity and Reliability of Instrument

The questionnaire was subjected to expert review by specialists in maternal health and emergency obstetric care to ensure face and content validity. A pilot test was conducted among healthcare providers in a similar setting outside the study site, and feedback obtained was used to refine the instrument prior to final administration.

Data Collection Procedure

Data collection was conducted over a defined period following ethical approval and institutional authorization. Eligible participants were approached, informed about the study objectives and procedures, and written informed consent was obtained. Questionnaires were self-administered to minimize interviewer bias, while the researcher and trained assistants provided clarification where necessary. Completed questionnaires were retrieved immediately to ensure completeness and maximize response rate.

Data Analysis

Data were analyzed using descriptive statistical methods. Frequencies and percentages were used to summarize categorical variables, including socio-demographic characteristics, emergency response times, and identified challenges in PPH management. Results were presented in tables for clarity and ease of interpretation.

Ethical Considerations

Ethical approval was obtained from the appropriate institutional review body. Participation was voluntary, and respondents were assured of confidentiality and anonymity. All data were securely stored and used solely for research purposes.

Results

The socio-demographic characteristics of respondents are presented in Table 1. The findings indicate a predominantly experienced workforce. Most participants were aged 41–50 years (36.0%) and above 50 years (26.7%), while only 14.7% were aged 18–30 years. Females constituted the majority (62.7%), reflecting the gender distribution commonly observed in obstetric and nursing care settings.

In terms of professional cadre, nurses accounted for 58.7% of respondents, while medical officers comprised 41.3%, indicating a multidisciplinary representation with a greater proportion of frontline nursing staff. Regarding years of experience, the majority of respondents had over a decade of clinical experience, with 37.3% reporting 11–20 years and 30.7% reporting more than 20 years of practice. Only 13.3% had less than five years of experience.

Overall, the sample reflects a relatively mature and experienced group of healthcare providers, which strengthens the reliability of insights regarding emergency response and challenges in postpartum hemorrhage management.

Table 1
Socio-demographic Characteristics of Respondents (N = 75)

Category	Frequency (n)	Percentage (%)
Age (years)		
18–30	11	14.7
31–40	17	22.7
41–50	27	36.0
Above 50	20	26.7
Total	75	100
Gender		
Male	28	37.3
Female	47	62.7
Total	75	100
Profession		
Nursing	44	58.7
Medical Officer	31	41.3
Total	75	100
Years of Experience		
Less than 5 years	10	13.3
5–10 years	14	18.7
11–20 years	28	37.3
Above 20 years	23	30.7
Total	75	100

The findings on emergency response to postpartum hemorrhage (PPH) are presented in Table 2. Notable delays were observed, as only 24.0% of respondents reported initiating intervention within five minutes of symptom onset, while 33.3% indicated delays exceeding 15 minutes. Similarly, rapid mobilization of emergency teams was suboptimal, with just 26.7% achieving activation within five minutes and one-third reporting delays beyond 15 minutes.

Key contributors to delayed response were largely systemic and workforce-related. The most frequently reported factors included shortage of trained personnel (64.0%), delayed recognition of PPH symptoms

(53.3%), and inefficient communication between healthcare teams (50.7%). Limited access to essential medications (46.7%) and lack of surgical materials (40.0%) further compounded these delays.

Although 69.3% of respondents reported that emergency response systems for PPH were available, their functionality appeared inconsistent. Emergency preparedness was further undermined by infrequent simulation drills, with 33.3% of respondents indicating that drills were rarely conducted and only 13.3% reporting monthly practice.

In terms of team coordination, only 22.7% of respondents reported immediate mobilization of multidisciplinary teams, while the majority experienced delays of up to 10 minutes or more. Persistent structural barriers to improving response times included inadequate staffing (62.7%), lack of standardized guidelines (56.0%), limited availability of emergency drugs (50.7%), and insufficient monitoring equipment (48.0%).

Overall, these findings highlight significant gaps between the availability of emergency response systems and their effective, timely implementation in clinical practice.

Table 2
Frequency and Percentage Distribution of Emergency Response Items (N = 75)

Item	Response Options	Frequency (n)	Percentage (%)
1. Average response time from onset of PPH symptoms to intervention	Within 5 minutes	18	24.0
	5–15 minutes	32	42.7
	More than 15 minutes	25	33.3
Total		75	100
2. Speed of mobilizing emergency PPH response team	Within 5 minutes	20	26.7
	5–15 minutes	30	40.0
	More than 15 minutes	25	33.3
Total		75	100
3. Factors contributing to delays in emergency response (Multiple response)	Delayed recognition of symptoms	40	53.3
	Shortage of trained personnel	48	64.0
	Lack of immediate access to medications	35	46.7
	Inefficient communication between healthcare teams	38	50.7
	Non-availability of surgical materials	30	40.0
	Others	10	13.3
4. Is emergency response for PPH readily available?	Yes	52	69.3
	No	23	30.7
Total		75	100
5. Frequency of emergency drills for PPH	Monthly	10	13.3
	Quarterly	22	29.3
	Annually	18	24.0
	Rarely	25	33.3

Item	Response Options	Frequency (n)	Percentage (%)
Total		75	100
6. Efficiency of mobilizing a multidisciplinary emergency team	Immediately upon recognition	17	22.7
	Within 5–10 minutes	34	45.3
	Takes longer than 10 minutes	24	32.0
Total		75	100
7. Challenges in improving emergency response times (Multiple response)	Lack of standardized guidelines	42	56.0
	Limited availability of emergency drugs	38	50.7
	Inadequate staffing	47	62.7
	Insufficient monitoring equipment	36	48.0
	Others	9	12.0

The challenges affecting postpartum hemorrhage (PPH) management are summarized in Table 3. The findings indicate that these challenges are predominantly systemic and structural. The most frequently reported barriers to emergency preparedness were inadequate staffing (69.3%), shortage of essential medications (64.0%), and inadequate infrastructure (61.3%). Poor interdepartmental coordination (54.7%) and delayed supply chains (57.3%) further underscore weaknesses in institutional organization and logistics.

Staffing constraints emerged as a critical limitation to effective emergency response. A combined 69.4% of respondents reported that staffing shortages occur frequently or always, while 65.3% indicated difficulties in recruiting and retaining skilled personnel. These findings suggest persistent human resource gaps that directly affect the capacity to respond promptly to obstetric emergencies.

Supply chain inefficiencies also significantly impacted PPH management. Over 60% of respondents reported that delays in the supply of essential medications resulted in either frequent treatment disruptions (41.3%) or severe shortages affecting patient survival (20.0%). These findings indicate that logistical bottlenecks remain a major barrier to timely and effective clinical intervention.

Funding-related constraints further compound these challenges, with insufficient government allocation (44.0%) and low prioritization of maternal health (37.3%) identified as key contributors. In addition,

critical infrastructure gaps were evident, including lack of rapid blood transfusion services (56.0%), shortage of monitoring equipment (62.7%), and absence of dedicated emergency maternity units (52.0%).

Overall, these findings demonstrate that challenges in PPH management are largely driven by systemic deficiencies rather than individual provider limitations.

Table 3: Frequency and Percentage Distribution of Challenges in PPH Management (N = 75)

Item	Response Options	Frequency (n)	Percentage (%)
1. Primary barriers affecting PPH emergency preparedness (Multiple responses)	Inadequate staffing levels	52	69.3
	Shortage of essential medications	48	64.0
	Delayed supply chain	43	57.3
	Limited funding	38	50.7
	Inadequate infrastructure	46	61.3
	Poor inter-departmental coordination	41	54.7
	Others	9	12.0
2. Frequency of staffing shortages affecting PPH response	Never	5	6.7
	Occasionally	18	24.0
	Frequently	32	42.7
	Always	20	26.7
3. Challenges with recruiting/retaining skilled personnel	Yes	49	65.3
	No	14	18.7
	Not sure	12	16.0
4. Effect of supply chain delays on medication availability	No impact	7	9.3
	Occasional shortages	22	29.3
	Frequent delays affecting treatment	31	41.3
	Severe shortages affecting survival	15	20.0
5. Factors contributing to funding limitations	Insufficient govt. allocation	33	44.0
	Low priority for maternal health	28	37.3
	Lack of external support	19	25.3

Item	Response Options	Frequency (n)	Percentage (%)
	Others	6	8.0
6. Infrastructure limitations affecting PPH management (Multiple responses)	Lack of maternity emergency units	39	52.0
	No rapid blood transfusion services	42	56.0
	Limited surgical capacity	35	46.7
	Shortage of monitoring equipment	47	62.7
	Others	8	10.7

Discussion of Findings

The findings of this study reveal both strengths and critical gaps in the management of postpartum hemorrhage (PPH) within the obstetric care units of the University of Osun Teaching Hospital, Osogbo. The assessment of emergency response times highlights significant delays in initiating intervention, with only 24% of respondents reporting that treatment begins within five minutes of symptom onset. A larger proportion reported response times of 5–15 minutes (42.7%), while 33.3% experienced delays exceeding 15 minutes. These findings are consistent with reports from similar low- and middle-income settings, where delayed recognition of symptoms, inadequate staffing, and resource limitations contribute to prolonged response times. [6,16] Given the rapid progression of PPH and its potential to become life-threatening within minutes, these delays underscore the urgent need for improved emergency preparedness and rapid response protocols.

Similarly, the mobilization of emergency response teams was found to be suboptimal. Only 26.7% of teams were activated within five minutes, while the majority (40%) required 5–15 minutes. These delays were largely attributed to systemic challenges, including shortages of skilled personnel (64%), delayed recognition of symptoms (53.3%), poor communication among healthcare providers (50.7%), and limited immediate access to essential medications (46.7%). These findings corroborate previous studies identifying human resource constraints and communication inefficiencies as major contributors to substandard emergency obstetric care. [4,17] Although 69.3% of respondents reported the availability of emergency response systems, the low frequency of emergency drills with only 13.3% conducted monthly and 33.3% rarely conducted suggests that structural availability does not necessarily translate into functional preparedness. This aligns with existing evidence emphasizing the importance of routine simulation exercises in improving PPH response outcomes. [13,18]

Further challenges identified in improving emergency response times include the lack of standardized guidelines (56%), inadequate staffing (62.7%), limited availability of emergency drugs (50.7%), and

insufficient monitoring equipment (48%). These findings reinforce the notion that systemic and structural factors, rather than individual provider knowledge alone, play a dominant role in determining the effectiveness of PPH management. [6,12] The presence of resources without efficient systems for coordination and implementation may still result in delayed or suboptimal care, as reflected in this study.

The broader analysis of challenges in PPH management (Table 3) further highlights systemic deficiencies. High proportions of respondents identified inadequate staffing (69.3%), shortages of essential medications (64%), and infrastructural limitations (61.3%) as major barriers. Staffing shortages were reported to affect emergency response frequently (42.7%) or always (26.7%), while 65.3% of respondents indicated difficulties in recruiting and retaining skilled personnel. These findings are consistent with previous studies conducted in Nigeria and other low-resource settings, which highlight human resource constraints as a major barrier to effective maternal healthcare delivery. [1,17,19]

Supply chain inefficiencies were also prominent, with 41.3% of respondents reporting frequent treatment delays due to medication shortages and 20% indicating severe shortages that directly affect patient survival. This aligns with evidence emphasizing the importance of timely availability of essential medications, such as tranexamic acid, oxytocin, and misoprostol; in the effective management of PPH. [8] Funding constraints further compound these challenges, with 44% of respondents citing insufficient government allocation and 37.3% identifying low prioritization of maternal health as key issues.

Infrastructural limitations; including lack of dedicated maternity emergency units (52%), limited access to rapid blood transfusion services (56%), inadequate surgical capacity (46.7%), and shortages of monitoring equipment (62.7%) reflect a broader pattern of under-resourced health systems. These findings are consistent with studies demonstrating that inadequate infrastructure and resource allocation are key determinants of maternal morbidity and mortality in PPH cases. [16, 20, 21]

Taken together, the findings suggest that while emergency response structures for PPH are present in the study setting, their effectiveness is constrained by systemic and structural deficiencies. Delays in response times, infrequent emergency drills, shortages of skilled personnel, and inadequate resources collectively compromise the quality of care and increase maternal risk. These findings support existing literature highlighting the multifactorial nature of barriers to effective PPH management in low-resource settings, encompassing human, material, and organizational factors. [6,13,17] Addressing these gaps requires a comprehensive health systems strengthening approach, including capacity building through continuous staff training, implementation of standardized emergency protocols, strengthening of supply chain systems, improved resource allocation, and regular multidisciplinary simulation exercises to enhance preparedness and response.

Limitations of the Study

This study provides valuable insight into emergency preparedness for postpartum hemorrhage (PPH) among healthcare providers in a tertiary hospital setting; however, certain limitations should be

considered when interpreting the findings. The cross-sectional design offers a snapshot of current practices and perceptions, but does not allow for assessment of changes over time or causal relationships between identified factors and preparedness levels.

In addition, the use of self-reported data may introduce some degree of response bias, as participants' responses may reflect personal perceptions in addition to actual practice. Nevertheless, this approach is widely used in health systems research to assess provider knowledge and institutional readiness.

Furthermore, the study was conducted in a single tertiary health facility, which provides a focused assessment of a specialized care setting but may limit direct generalization to lower-level facilities with different resource capacities and organizational structures.

Despite these considerations, the study offers important and context-specific evidence on systemic and operational factors affecting PPH emergency preparedness, which may be useful for guiding quality improvement initiatives and strengthening maternal health services in similar settings

Conclusion

The results of this study show that although emergency response mechanisms for postpartum hemorrhage (PPH) are available inside the obstetrics care units at the University of Osun Teaching Hospital, they are greatly limited due to systemic and structural barriers. The slow start of interventions, sluggish activity of emergency teams, lack of skilled manpower, lack of emergency medication, lack of infrastructure and a lack of emergency drills are collectively responsible for delaying and inadequate management of PPH. These challenges highlight the urgent importance of strengthening health systems as a whole to ensure that maternal health emergencies are covered by effective systems and processes that lead to a reduction in preventable maternal morbidity and mortality.

Recommendations

1. The hospital management and obstetrics department should organise regular and mandatory multidisciplinary PPH emergency drills to ensure team coordination and quicker response times.
2. The hospital administration should in collaboration with the obstetrics care units develop and enforce standardized protocols and guidelines for PPH management throughout the hospitals.
3. The human resources department in conjunction with the hospital management and professional bodies is responsible for strengthening the staffing capacity through recruitment of additional skills and continuous training and refresher courses for the existing staff.
4. The pharmacy department in collaboration with the hospital management and suppliers should ensure a regular availability of essential medications (such as oxytocin, misoprostol and tranexamic acid) through better supply chain management.
5. Hospital management should upgrade infrastructural facilities, including the establishment of dedicated maternity emergency units, rapid blood transfusion services, and sufficient monitoring

equipment

6. Policymakers, hospital management and institutional financial officers should make a case for additional funding and priority to maternal healthcare to support sustainable improvement in PPH emergency preparedness.

Declarations

Ethical Approval and Consent to Participate

Ethical approval for this study was obtained from the Ethics Committee of UNIOSUN Teaching Hospital, Osogbo, Osun State. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and its subsequent amendments. Written informed consent was obtained from all participants before enrollment, and confidentiality of participant information was strictly maintained.

Consent to Participate

Informed consent was obtained from all individual participants included in the study. Participation was voluntary, and all participants were assured of confidentiality and the right to withdraw from the study at any time without any consequences.

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Data Availability Statement

The datasets generated and/or analysed during the current study are available from the corresponding author on reasonable request.

Contributions: O.L. Odesanya and A.R. Oyekale conceptualized and designed the study. A.O. Onasoga and O.J. Odesanya collected the data. A.O. Fasanu performed the statistical analysis. O.L. Odesanya drafted the manuscript. All authors critically reviewed the manuscript and approved the final version.

Conflict of interest: The authors declare no potential conflict of interests

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