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PROMPT REFERRAL PRACTICES AS A STRATEGY FOR THE MANAGEMENT OF OBSTETRIC EMERGENCIES

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Abstract

Background: Obstetric emergencies, including postpartum haemorrhage, severe pre-eclampsia and eclampsia, obstructed labour, puerperal sepsis and complications of unsafe abortion, remain the leading direct causes of maternal and perinatal mortality in sub-Saharan Africa. Prompt referral from community and primary-care levels to facilities providing emergency obstetric care is a critical, yet persistently weak, link in the continuum of maternity care.

Objective: To systematically identify and synthesise the available evidence on prompt referral practices used as a strategy for the management of obstetric emergencies in sub-Saharan Africa, and to characterise the referral models, communication modalities, pre-referral care content, outcomes and implementation barriers reported.

Methods: A scoping review was conducted following the Joanna Briggs Institute methodology and reported per the PRISMA-ScR checklist. PubMed/MEDLINE, CINAHL, Scopus, African Index Medicus and grey-literature sources were searched for records published between January 2015 and March 2025. Two reviewers independently screened titles, abstracts and full texts against pre-specified eligibility criteria.

Results: Sixty-two records met the inclusion criteria. Six themes emerged: (i) community-to-facility referrals by traditional birth attendants and community health workers; (ii) facility-to-facility referrals from primary to secondary or tertiary care; (iii) pre-referral communication and mHealth-enabled triggers; (iv) referral-form completeness and the content of pre-referral care (magnesium sulphate, anticonvulsants, intravenous fluids); (v) maternal and perinatal death surveillance and response as a referral audit mechanism; and (vi) cross-cutting themes of equity, ambulance systems, cost and implementation. Reported referral completion rates ranged from 43 to 81 percent, with mean transfer times of 65 to 180 minutes.

Conclusion: Prompt referral practices for obstetric emergencies in sub-Saharan Africa remain sub-optimal and inequitably distributed. Strengthening nursing-led referral protocols, ambulance and communication systems, and maternal death surveillance and response offers a tractable pathway to reducing preventable maternal mortality.

Keywords: obstetric emergencies; referral; maternal mortality; sub-Saharan Africa; nursing; midwifery; emergency obstetric care; maternal death surveillance

INTRODUCTION

Statement of the Problem

Obstetric emergencies remain the leading direct cause of maternal and perinatal mortality in sub-Saharan Africa (SSA). The most recent inter-agency estimates indicate that approximately 287,000 maternal deaths occurred worldwide in 2020, of which SSA alone accounted for roughly seventy percent, with a regional maternal mortality ratio estimated at 545 maternal deaths per 100,000 live births.¹ In Nigeria, the maternal mortality ratio remains among the highest globally, with the 2018 Nigeria Demographic and Health Survey reporting 512 maternal deaths per 100,000 live births, and higher rates in the northern zones.¹⁵ Modelling exercises further indicate that, without accelerated action, the majority of SSA countries will fail to attain Sustainable Development Goal (SDG) target 3.1, which calls for a global maternal mortality ratio below 70 per 100,000 live births by 2030.^{2,6}

The five leading direct obstetric causes are postpartum haemorrhage, severe pre-eclampsia and eclampsia, obstructed labour, puerperal sepsis and complications of unsafe abortion, collectively accounting for over seventy percent of direct maternal deaths in SSA.^{4,10} The World Health Organization's handbook *Managing Complications in Pregnancy and Childbirth* articulates the clinical standards for the management of these emergencies, including the administration of magnesium sulphate for severe pre-eclampsia and eclampsia, uterotonics for postpartum haemorrhage, antibiotics for sepsis, and timely surgical intervention for obstructed labour and ruptured ectopic pregnancy.⁴ However, the effectiveness of these clinical interventions is contingent upon the timely identification of the emergency at the point of first contact and the prompt referral of the woman to a facility with the capacity to provide emergency obstetric care.^{5,7}

The seminal framework developed by Thaddeus and Maine identified three delays that contribute to maternal mortality: delay in deciding to seek care, delay in reaching an appropriate facility, and delay in receiving adequate care once the woman arrives.⁵ The second delay - delay in reaching care - is inextricably linked to the strength of the obstetric referral system. A referral system, in this context, comprises the protocols, communication channels, transport arrangements, human resources, and feedback loops that together enable the timely transfer of a woman experiencing an obstetric emergency from a lower-level facility or community setting to a higher-level facility capable of providing emergency obstetric care.^{7,32} A functional referral system is therefore a non-negotiable component of any strategy to reduce maternal mortality in SSA.^{8,9}

Despite three decades of programmatic investment, obstetric referral systems in SSA remain weak, fragmented and inequitably distributed. The *Monitoring Emergency Obstetric Care* handbook identifies six signal functions of basic emergency obstetric care and four additional functions of comprehensive emergency obstetric care, and proposes the United Nations process indicators (availability, geographic distribution, utilization and met need) for monitoring referral systems at district level.^{7,32} Yet audits in Malawi, Nigeria, Uganda and Cameroon consistently report sub-optimal completion of referral forms, absent pre-referral communication, inadequate pre-referral care (including under-administration of magnesium sulphate and uterotonics), and prolonged transfer times.^{18,19,23,25,39} In west Africa specifically, structural barriers including poor road networks, dysfunctional

ambulance systems, out-of-pocket costs of referral, and gendered decision-making at household level have been documented across multiple settings.^{13,15,24,27}

Emerging evidence suggests that prompt referral practices - defined as the timely initiation of referral, the use of structured referral protocols, the application of pre-referral first-line interventions, the activation of pre-referral communication channels, and the use of feedback mechanisms such as maternal and perinatal death surveillance and response (MPDSR) - can substantially reduce the case fatality rate of obstetric emergencies.^{17,21,30,51,52} However, the volume, modality mix and outcome evidence across SSA have not been systematically mapped using contemporary scoping review methodology. The present review addresses this gap by mapping the available evidence on prompt referral practices for the management of obstetric emergencies in SSA, with explicit attention to the role of nursing and midwifery in the referral cascade.

Aim of the Study

The aim of this scoping review is to systematically identify, map and synthesise the available evidence on prompt referral practices used as a strategy for the management of obstetric emergencies in sub-Saharan Africa. Specifically, the review addresses five research questions: (i) what referral models are currently in use for obstetric emergencies in SSA; (ii) what are their design features, target users and pre-referral care content; (iii) what outcomes are reported across referral completion, transfer time, maternal and perinatal mortality, referral quality, equity and implementation domains; (iv) what implementation barriers, facilitators and unintended consequences have been documented; and (v) what evidence gaps remain for nursing, midwifery and policy stakeholders in the West African sub-region and across SSA.

Significance of the Study

This review is significant for three principal audiences. First, for nursing and midwifery practitioners in west Africa, who are the largest group of maternal health service providers in the sub-region and who frequently serve as the first formal point of contact for women experiencing obstetric emergencies. By mapping the modalities and outcomes of prompt referral practices, the review can inform pre-service curricula, in-service training and the development of nursing-sensitive referral indicators.^{12,16,29} Second, for ministry-of-health policy makers and district health managers, who must decide which referral investments to prioritise, the synthesis of evidence on ambulance systems, communication modalities, MPDSR and cost considerations is intended to support evidence-informed prioritisation.^{9,11,14} Third, for researchers, donors and the WHO Regional Office for Africa, who require an up-to-date evidence map to identify priority evaluation questions and harmonise indicator sets. Although several systematic reviews of maternal referral in low- and middle-income countries have been published, none has scoped the specific intersection of prompt referral practices, obstetric emergencies, and SSA, with explicit attention to the role of nursing.^{17,21,22,30,31}

REVIEW OF RELATED LITERATURE AND THEORETICAL FRAMEWORK

Global and Regional Burden of Obstetric Emergencies

Maternal mortality in SSA must be understood against the backdrop of slow global progress, persistent regional inequalities

and the unfinished agenda of SDG 3. The inter-agency estimates published in 2023 indicate that the global maternal mortality ratio fell by approximately thirty-four percent between 2000 and 2020, yet SSA achieved only a marginal reduction during the same period and in fact saw maternal deaths rise in several countries between 2016 and 2020.¹ Modelling exercises using Global Burden of Disease data confirm that the leading direct obstetric causes (haemorrhage, hypertensive disorders, sepsis, abortion and obstructed labour) remain largely unchanged, but are increasingly compounded by indirect causes such as malaria, HIV, tuberculosis and emerging non-communicable diseases of pregnancy.^{3,10,11} In west Africa specifically, the maternal mortality ratio exceeds 700 deaths per 100,000 live births in several countries and is concentrated among adolescents, rural women and the poorest wealth quintiles.^{13,14,15} These patterns underscore the need for interventions that simultaneously extend the reach of emergency obstetric care and address the demand-side and supply-side barriers to its timely use.

Perinatal and neonatal outcomes are tightly coupled to the quality and timeliness of obstetric referral. An estimated 2.4 million children died in their first month of life in 2022, with SSA accounting for almost half of these deaths.⁵⁹ Approximately two-thirds of intrapartum-related neonatal deaths and stillbirths could be averted through high-quality emergency obstetric care and timely referral.^{3,10,59} Campbell and Graham's strategies for reducing maternal mortality articulated the centrality of functioning referral systems, skilled birth attendants and emergency obstetric care facilities within a unified district health system.⁹ Miller and colleagues extended this analysis, arguing that progress requires moving beyond the binary of too little, too late and too much, too soon, towards a contextually appropriate pathway of evidence-based maternity care that includes functional referral networks.¹⁰

The Three Delays Framework and the Referral Cascade

The three delays framework developed by Thaddeus and Maine in 1994 remains the most influential analytical lens for understanding maternal mortality in low-resource settings.⁵ The framework posits that maternal deaths occur as a result of cumulative delays: delay one in deciding to seek care (influenced by recognition of danger signs, decision-making autonomy, perceived quality of care and prior experience of services); delay two in reaching an appropriate facility (influenced by road infrastructure, availability and cost of transport, distance to facility, and the functionality of the referral system); and delay three in receiving adequate care once the woman arrives (influenced by staff availability, supplies, equipment, and clinical protocols).^{5,7} The three delays are sequential and cumulative, meaning that interventions to address delay one without addressing delays two and three may yield only marginal mortality reductions.^{5,9}

Within the three delays framework, the obstetric referral cascade occupies the critical juncture between delays one and three. Murray and Pearson conceptualise the referral cascade as comprising six sequential steps: (i) recognition of the obstetric emergency; (ii) decision to refer; (iii) initiation of pre-referral care; (iv) pre-referral communication; (v) physical transfer; and (vi) handover and continuum of care at the receiving facility.^{17,30} Failure at any step breaks the cascade and contributes to maternal or perinatal death. The referral cascade framework has been operationalised in audits across SSA, including criteria-based audits in Malawi,^{18,19} cross-sectional studies in Nigeria,^{23,24,25,26,27} and population-based studies in Uganda.³⁹ Taken together, the three delays framework and the

referral cascade framework offer a complementary analytical lens for the present review: the former illuminates the upstream and downstream determinants of maternal mortality, while the latter provides a granular, step-by-step framework for classifying and evaluating referral practices.^{17,21,30}

Categories of Obstetric Referral Practices

The literature describes several broad categories of obstetric referral practice relevant to the management of emergencies. First, community-to-facility referrals, in which traditional birth attendants (TBAs), community health workers (CHWs), village health teams and family members initiate the transfer of a woman with an obstetric emergency from the home or community to a primary, secondary or tertiary healthcare facility.^{22,44} Second, facility-to-facility referrals, in which a primary healthcare centre or basic emergency obstetric care facility refers a woman to a higher-level facility capable of providing comprehensive emergency obstetric care (including caesarean section and blood transfusion).^{23,26,27,32} Third, pre-referral communication, in which the referring facility or community health worker notifies the receiving facility in advance, allowing the receiving team to mobilise staff, blood products and theatre space.^{17,46,55} Fourth, the content of pre-referral care, including the administration of first-line interventions such as magnesium sulphate for severe pre-eclampsia and eclampsia, uterotonics for postpartum haemorrhage, intravenous fluids, antibiotics for sepsis, and the application of obstetric first aid.^{4,7,32}

Fifth, the use of mHealth and digital technologies to support referral, including mobile phone-based communication between referring and receiving facilities, GPS-enabled ambulance dispatch, WhatsApp-based clinical consultation, and integrated mHealth referral platforms.^{38,46,47,55} Sixth, maternal and perinatal death surveillance and response (MPDSR) as a referral audit and feedback mechanism, in which maternal and perinatal deaths are reviewed, contributing factors are identified, and recommendations for system strengthening are fed back to clinicians and managers.^{51,52,53,60} Seventh, specialised referral innovations such as motorcycle ambulances in rural Malawi and other low-resource settings, which extend the reach of conventional ambulance systems in areas with poor road infrastructure.^{38,45} The present scoping review deliberately encompasses all seven categories in order to capture the full breadth of prompt referral practices currently documented in SSA.

Previous Reviews and the Evidence Gap

Several systematic and narrative reviews have synthesised aspects of obstetric referral in low- and middle-income countries. Murray and Pearson's foundational review provided a comprehensive overview of maternity referral systems, identifying communication, transport, human resources and feedback as the four pillars of a functional referral system.^{17,30} Murray and colleagues' subsequent systematic review of referral interventions on maternal and perinatal mortality in low- and middle-income countries reported modest effects on maternal mortality but high heterogeneity across studies, and called for improved measurement of referral outcomes.²¹ Patel and colleagues' systematic review of community-based referral systems identified significant effects on skilled birth attendance and institutional delivery but inconclusive effects on maternal mortality.²² Bhandari and Dangal's narrative review summarised models, methods and outcomes of maternity referral systems in low- and middle-income countries, identifying

equity, cost and quality as under-researched areas.³¹ Bates and colleagues' seminal analysis argued that ineffective referral systems are an important contributor to maternal mortality in SSA, with implications for the design of interventions.⁴²

Despite this body of work, four gaps justify a focused scoping review. First, previous reviews either predate the rapid emergence of mHealth-enabled referral, WhatsApp-based clinical consultation and MPDSR audit-and-feedback, or include them only marginally. Second, few reviews explicitly address the role of nursing and midwifery in the referral cascade, despite nurses and midwives being the principal initiators of obstetric referrals in most SSA settings. Third, SSA-specific evidence has often been subsumed within broader low- and middle-income country samples, masking region-specific implementation lessons. Fourth, none has been guided by the JBI scoping-review methodology with PRISMA-ScR reporting, which would provide an explicit and replicable map of the evidence landscape. The present review addresses these four gaps.

Theoretical Framework

This scoping review is informed by two complementary theoretical frameworks. The Three Delays Framework of Thaddeus and Maine provides the overarching analytical lens, situating obstetric referral within the broader system of maternal mortality determinants and explicitly recognising that referral interventions must address the second delay (reaching care) in conjunction with delays one and three.⁵ The Referral Cascade Framework developed by Murray and Pearson provides a more granular, step-by-step analytical lens, classifying referral practices by their position within the cascade (recognition, decision, pre-referral care, communication, transfer, handover) and thereby supporting a structured synthesis of evidence on which cascade steps are addressed by which interventions.^{17,30} Together, these two frameworks support interpretation across both process (cascade steps) and outcome (maternal and perinatal mortality, equity, cost) dimensions, and provide a basis for the thematic analysis reported below.

METHODS

Study Design

A scoping review was conducted following the Joanna Briggs Institute (JBI) methodology for scoping reviews as updated by Peters and colleagues in 2020.³⁵ The review protocol was developed a priori and is reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR).³⁶ The methodological framework of Arksey and O'Malley, as advanced by Levac and colleagues, provided the five-stage operational architecture: (i) identifying the research question; (ii) identifying relevant studies; (iii) study selection; (iv) charting the data; and (v) collating, summarising and reporting the results.^{33,34} The review was not registered on the Open Science Framework; the protocol is available from the corresponding author on reasonable request.

Eligibility Criteria

Eligibility criteria were structured using the JBI Population-Concept-Context (PCC) framework. The population of interest was pregnant women, women in labour and the postpartum period, and the community health workers, nurses, midwives, obstetric providers and programme managers who serve them in SSA. The concept was prompt referral practices used as a strategy for the

management of obstetric emergencies, including community-to-facility referrals, facility-to-facility referrals, pre-referral communication and mHealth-enabled referral triggers, the content of pre-referral care (magnesium sulphate, uterotonics, intravenous fluids, antibiotics), referral-form completeness, ambulance and transport systems, and maternal and perinatal death surveillance and response as a referral audit mechanism. The context was sub-Saharan Africa, defined as the 46 countries of the WHO African Region plus Sudan, in line with the World Bank sub-Saharan Africa classification.⁵⁴

Studies were eligible if they were peer-reviewed primary research (randomised, quasi-experimental, observational, qualitative, mixed-methods, audit, pilot or feasibility), systematic or scoping reviews, or institutional grey-literature reports (WHO, UNICEF, UNFPA, World Bank, ministries of health) published between January 2015 and March 2025; reported on at least one prompt referral practice deployed for obstetric emergencies; and were set in SSA. Studies were excluded if they were purely protocol papers without results; opinion pieces, commentaries or editorials without primary data; focused exclusively on routine antenatal or postnatal care without an obstetric emergency or referral linkage; set outside SSA; or not available in English, French or Portuguese. Conference abstracts with no full-text equivalent were retained for grey-literature completeness but flagged in the data-charting form.

Information Sources and Search Strategy

A comprehensive search strategy was developed in consultation with a research librarian at the University of Ibadan. Five bibliographic databases were searched: PubMed/MEDLINE, CINAHL (EBSCOhost), Scopus, African Index Medicus (WHO AFRO) and Google Scholar (first one-hundred records). Grey-literature sources included the WHO institutional repository (IRIS), the UNICEF publications catalogue, the World Bank Open Knowledge Repository, the United Nations Population Fund (UNFPA) repository and the African Journals Online (AJOL) platform. Hand-searching of reference lists of included studies and of three key journals (BMC Pregnancy and Childbirth, African Journal of Reproductive Health, Pan African Medical Journal) was also undertaken.

Search terms combined three concept blocks with Boolean operators: (obstetric OR maternal OR pregnancy OR labour OR postpartum) AND (emergency OR complication OR haemorrhage OR eclampsia OR pre-eclampsia OR obstructed labour OR sepsis OR abortion) AND (referral OR transfer OR ambulance OR transport OR communication OR mHealth OR MPDSR OR surveillance). Medical Subject Headings (MeSH) were used in PubMed/MEDLINE, with equivalent subject headings adapted for CINAHL and Scopus. The sample PubMed search string is provided in Appendix B. The database searches were executed in March 2025, with automated alerts set to capture records indexed subsequently until the date of submission.^{37,51}

Selection Process

Following deduplication in EndNote 21 and Rayyan, two reviewers (Ijaola V.A. and Ohaeri B.M.) independently screened titles and abstracts against the eligibility criteria, with disagreements resolved by discussion and, where necessary, by arbitration by a third reviewer (Ndikom C.M.). Full texts of potentially eligible records were retrieved and independently assessed by the same two reviewers, with reasons for exclusion recorded in a PRISMA-ScR flow diagram (Appendix A). Inter-reviewer agreement was

estimated using Cohen's kappa, with a target agreement threshold of at least 0.80; in this review the kappa for full-text screening was 0.84, indicating strong agreement.

Data Charting

A standardised, pilot-tested data-charting form captured the following fields: bibliographic details (first author, year, country, setting, study design, sample size, funding source); referral model (community-to-facility, facility-to-facility, mHealth-enabled, ambulance-based, MPDSR-linked, or hybrid); target user (pregnant woman, family member, traditional birth attendant, community health worker, nurse or midwife, obstetric provider, programme manager); position within the referral cascade (recognition, decision, pre-referral care, communication, transfer, handover); content of pre-referral care (magnesium sulphate, uterotonics, intravenous fluids, antibiotics, obstetric first aid); referral outcomes reported (referral completion rate, transfer time, inter-facility communication rate, form completeness, maternal mortality, case fatality rate, maternal near-miss, perinatal outcomes); equity outcomes (rural-urban, wealth quintile, education, age); cost and implementation outcomes (cost, feasibility, acceptability, barriers and facilitators); and the reported implementation barriers and facilitators. Charting was performed independently by two reviewers using a shared Excel workbook, with disagreements resolved by consensus.^{35,36}

Synthesis of Results

A descriptive numerical summary of study characteristics was prepared, followed by a thematic analysis informed by the Three Delays framework and the referral cascade framework articulated above. Themes were derived inductively from the charted data and deductively from the research questions; thematic saturation was reached when no new themes emerged from successive included studies. The synthesis is presented in narrative form, supplemented by Table 1 (study characteristics), and is organised under six thematic headings: (i) community-to-facility referrals; (ii) facility-to-facility referrals; (iii) pre-referral communication and mHealth-enabled triggers; (iv) referral-form completeness and pre-referral care content; (v) maternal and perinatal death surveillance and response; and (vi) cross-cutting implementation themes.^{33,35,36}

RESULTS

Study Selection

The database and grey-literature searches yielded 2,184 records, of which 612 were duplicates and were removed. Title-and-abstract screening of the remaining 1,572 records excluded a further 1,278 records, leaving 294 full texts for eligibility assessment. Full-text review excluded an additional 232 records: 98 were set outside SSA; 47 reported exclusively on routine antenatal or postnatal care without an obstetric emergency or referral linkage; 38 were protocol or opinion pieces without primary data; 28 did not report a referral practice within scope; and 21 were not retrievable in full text. Sixty-two records met the eligibility criteria and were included in the scoping review. The PRISMA-ScR flow diagram is presented in Appendix A.

Study Characteristics

Of the 62 included records, 41 were primary empirical studies (8 randomised or cluster-randomised trials, 14 quasi-experimental or pre-post studies, 12 qualitative or mixed-methods studies, and 7 audits or criteria-based reviews); 12 were systematic or scoping

reviews; and 9 were institutional reports or grey-literature documents. Geographically, 22 studies were conducted in West Africa (Nigeria, Ghana, Mali, Senegal, Burkina Faso, Côte d'Ivoire), 18 in East Africa (Kenya, Tanzania, Uganda, Rwanda, Ethiopia, Burundi), 9 in Southern Africa (Mozambique, Malawi, Zambia, Zimbabwe, South Africa), 5 in Central Africa, and 8 were multi-country. The modal publication year was 2020 ($n = 11$), with a clear inflection in obstetric referral publications from 2018 onward, coinciding with the WHO publication of strategies towards ending preventable maternal mortality.⁵⁸

Thematic Synthesis

Community-to-Facility Referrals by Traditional Birth Attendants and Community Health Workers

Eleven included records reported on community-to-facility referral practices initiated by traditional birth attendants, community health workers, village health teams and family members. Patel and colleagues' systematic review of community-based referral systems in low- and middle-income countries reported significant effects on skilled birth attendance and institutional delivery but inconclusive effects on maternal mortality, attributing this in part to the persistence of delay three once women reached facilities.²² Harvey and colleagues' multi-country assessment of skilled birth attendant competence found that recognition of obstetric danger signs was inconsistent at community level, particularly for postpartum haemorrhage and severe pre-eclampsia.⁴⁴ In Uganda, Mpemba Nuuli and colleagues reported that 71 percent of obstetric referrals from community settings reached the receiving facility within four hours, but that only 43 percent were accompanied by any form of pre-referral communication.³⁹ In Nigeria, Adamu and Salihu documented significant socio-economic and geographic inequities in community-to-facility referral, with rural women twice as likely to experience delay in deciding to seek care.⁴⁰ The principal implementation barriers were the cost of transport, the absence of formal ambulance systems in rural areas, and the gendered decision-making structures that constrain women's autonomy in seeking emergency care.^{13,20,40,42}

Facility-to-Facility Referrals from Primary to Secondary or Tertiary Care

Eighteen included records reported on facility-to-facility obstetric referrals. Oyesanya and colleagues' study of obstetric referrals at Olabisi Onabanjo University Teaching Hospital in Sagamu, Nigeria, found that 67 percent of referred women were transferred from primary healthcare centres, with the leading indications being prolonged labour, severe pre-eclampsia and antepartum haemorrhage.²³ Adeleye and colleagues' appraisal of the referral system in Ibadan reported that referral-form completeness averaged 38 percent, with critical information (blood pressure, fetal heart rate, treatments administered) frequently missing.^{26,27} Adeoye and colleagues' study of determinants and outcomes of obstetric referrals from primary healthcare facilities in Ibadan further documented that only 56 percent of referred women reached the receiving facility alive, and that delay in initiation of referral was the strongest predictor of maternal mortality.⁴¹ Awoyinka and colleagues documented that acceptance of maternal referral services was significantly associated with women's education, spousal consent and proximity to the referring facility.²⁴ In Malawi, Kongnyuy and colleagues' criteria-based audit of obstetric referrals identified substantial substandard care in the pre-referral period, including under-administration of magnesium sulphate for

severe pre-eclampsia and of oxytocin for postpartum haemorrhage.^{18,19} Sabitu and Iliyasu reported a case fatality rate of 8.4 percent among referred women at Murtala Mohammed Specialist Hospital, Kano, with haemorrhage and eclampsia as the leading causes of death.²⁸ In Cameroon, although fewer studies were available, similar patterns of sub-optimal referral-form completion and inadequate pre-referral care were documented.^{22,30}

Pre-referral Communication and mHealth-Enabled Triggers

Nine included records reported on pre-referral communication and mHealth-enabled referral triggers. Wilson and colleagues' scoping review of mobile phone-based ambulance dispatch and emergency obstetric referral identified a growing evidence base for SMS, mobile-app and WhatsApp-based referral systems in SSA, with reported reductions in mean transfer times of 30 to 60 minutes.⁴⁶ Ngabo and colleagues' mobile phone-based birth preparedness and complication readiness intervention in Rwanda increased the proportion of women reaching the receiving facility with prior notification from 28 percent at baseline to 67 percent at endline.⁴⁷ Wilson and colleagues' systematic review of WhatsApp-based communications and mHealth tools for obstetric referral in low-resource settings reported high user acceptability and significant reductions in maternal case fatality in two cluster-randomised trials.⁵⁵ Lungu and colleagues' 5-year review of maternal mortality at a tertiary hospital in Malawi reported that mHealth-enabled pre-referral communication was associated with a 19-percent reduction in case fatality among women referred with severe pre-eclampsia.⁴⁵ The principal implementation barriers were intermittent network coverage, the cost of mobile data, language diversity and the absence of formal integration with national health information systems.^{37,46,47,55}

Referral-Form Completeness and Content of Pre-referral Care

Twelve included records reported on the completeness of referral forms and the content of pre-referral care. Adeleye and colleagues' study in Ibadan reported that referral-form completeness averaged 38 percent, with critical information on blood pressure, fetal heart rate, treatments administered and indication for referral frequently missing.²⁶ Fawole and colleagues' appraisal of the obstetric referral system in Ibadan found that only 22 percent of referred women received first-line pre-referral care consistent with WHO standards, including magnesium sulphate for severe pre-eclampsia, oxytocin for postpartum haemorrhage and antibiotics for sepsis.²⁷ Kongnyuy and colleagues' criteria-based audit in Malawi identified that the administration of magnesium sulphate for severe pre-eclampsia increased from 41 percent at baseline to 78 percent at endline following the introduction of a structured referral protocol.¹⁸ Otolorin's narrative review emphasised the role of structured referral protocols, nurse-led checklists and pre-referral communication in reducing maternal mortality in SSA.²⁹ Bates and colleagues' seminal analysis argued that ineffective referral systems, including incomplete referral forms and inadequate pre-referral care, are an important contributor to maternal mortality in SSA.⁴² The WHO handbook *Managing Complications in Pregnancy and Childbirth* articulates the clinical standards for pre-referral care, including the administration of magnesium sulphate, uterotonics and intravenous fluids.^{4,7,32}

Maternal and Perinatal Death Surveillance and Response (MPDSR) as a Referral Audit Mechanism

Seven included records reported on MPDSR or facility-based maternal death review as a referral audit and feedback mechanism.

The WHO technical guidance on maternal death surveillance and response, published in 2013, articulates the cycle of identification, notification, review, response and feedback of maternal deaths, with explicit attention to the identification of referral system failures.⁵¹ Pata and colleagues' review of the role of MPDSR in improving the quality of obstetric care in SSA reported that the institutionalisation of MPDSR was associated with significant improvements in referral-form completeness, pre-referral communication and case fatality reduction, although sustainability remained a challenge.⁵² Enuke and Ohaeri's study of maternal deaths following obstetric referrals in a Nigerian tertiary hospital identified that 68 percent of maternal deaths were associated with sub-optimal referral practices, including absent pre-referral communication and inadequate pre-referral care.⁵³ Olowokere and colleagues' review of maternal death review in southwest Nigeria identified substantial opportunities for strengthening the obstetric referral system, including the introduction of structured referral protocols, the institutionalisation of pre-referral communication, and the formal integration of MPDSR findings into district health management.⁶⁰ Say and colleagues' maternal near-miss approach, and Souza and colleagues' maternal severity index, provide complementary measurement tools for evaluating the quality of obstetric referral systems.^{49,50} Knight and colleagues' systematic review of methods for measuring maternal mortality and severe maternal morbidity further supports the use of facility-based audit as a referral quality improvement tool.⁴⁸

Cross-Cutting Implementation Themes

Across the six thematic categories, four cross-cutting implementation themes emerged. First, the cost of referral remained the dominant barrier, with out-of-pocket payments for ambulance services, fuel, blood products and user fees reported in 31 of the 62 included records; in some settings, women and families delayed or declined referral because they could not afford the cost of care.^{13,27,40,42,43} Second, ambulance and transport systems were consistently reported as weak or absent, particularly in rural and peri-urban areas; motorcycle ambulance innovations in Malawi and other low-resource settings offered a partial solution, but scalability and sustainability remained concerns.^{38,45} Third, human-resource constraints, including the shortage of skilled birth attendants, the limited availability of nurses and midwives at primary healthcare level, and the absence of in-service training on obstetric emergency management, were recurrent.^{12,16,29,44} Fourth, the absence of formal feedback loops between referring and receiving facilities, and between facilities and the MPDSR system, was reported in 24 of the 62 included records and represents a significant missed opportunity for system learning.^{19,27,51,52,60}

A notable gap across the included records was the limited reporting of equity-stratified outcomes (by wealth quintile, education, age, urban-rural residence), of cost-effectiveness analyses, and of qualitative evaluations of women's and providers' experiences of the referral process. Only nine of the 62 included records reported any equity-stratified outcomes; only five reported cost-effectiveness data; and only eleven reported qualitative evaluations. These gaps represent priority evidence needs for nursing and policy stakeholders in the West African sub-region.^{21,30,57,58}

DISCUSSION

This scoping review has mapped the available evidence on prompt referral practices used as a strategy for the management of obstetric

emergencies in sub-Saharan Africa. The principal findings are that: (i) the evidence base has matured since 2018, with a clear shift from descriptive audits towards intervention studies of mHealth-enabled referral and MPDSR audit-and-feedback; (ii) effects on referral completion, transfer time and case fatality are consistently positive when interventions address multiple steps of the referral cascade, although effect sizes vary by intervention and study design; (iii) evidence on maternal and neonatal mortality, on equity-stratified outcomes, and on cost-effectiveness remains thin; and (iv) implementation barriers are remarkably consistent across settings, suggesting the value of a regional approach to referral investment and evaluation in West Africa. These findings align with the conceptual framing provided by the Three Delays Framework and the Referral Cascade Framework, both of which direct attention to the cumulative and sequential nature of referral delays.^{5,17,30}

The findings are broadly consistent with previous systematic reviews of obstetric referral in low- and middle-income countries. Murray and Pearson's foundational review identified communication, transport, human resources and feedback as the four pillars of a functional referral system, a classification echoed in the themes of this review.^{17,30} Murray and colleagues' subsequent systematic review of referral interventions reported modest effects on maternal mortality but high heterogeneity across studies, a pattern echoed here.²¹ Patel and colleagues' review of community-based referral systems reported significant effects on skilled birth attendance but inconclusive effects on maternal mortality.²² The present review extends this body of work by mapping the post-2018 emergence of mHealth-enabled referral, WhatsApp-based clinical consultation and MPDSR audit-and-feedback, which have largely been marginal in previous reviews.^{21,46,55}

Implications for Nursing and Midwifery Practice

Nurses and midwives constitute the largest group of maternal health service providers in SSA, and are the principal initiators and recipients of obstetric referrals in most settings. The findings have four implications for nursing and midwifery practice in West Africa. First, pre-service curricula should incorporate structured training on obstetric emergency recognition, pre-referral care (including the administration of magnesium sulphate, uterotonics, intravenous fluids and antibiotics), structured referral protocols, and pre-referral communication, alongside existing midwifery content.^{4,7,29,32} Second, in-service continuing professional development should equip practising nurses and midwives to deliver evidence-based pre-referral care and to use mHealth-enabled referral platforms, including WhatsApp-based clinical consultation with obstetric specialists.^{37,46,55} Third, nursing-sensitive referral indicators (e.g., referral-form completeness rate, pre-referral communication rate, pre-referral care compliance rate, MPDSR-recommendation implementation rate) should be developed and integrated into national health-management information systems.^{7,32,51,52} Fourth, the West African College of Nursing should consider convening a regional referral reference group to articulate practice standards, ethical guidelines and interoperability requirements for obstetric referral systems.^{12,16,29}

Implications for Policy and Practice

For ministries of health and district health managers in SSA, the findings suggest four policy priorities. First, investment in obstetric referral systems should be explicitly aligned with the WHO

strategies towards ending preventable maternal mortality (EPMM), which articulate the centrality of functional referral systems, skilled birth attendants and emergency obstetric care facilities within a unified district health system.⁵⁸ Second, the institutionalisation of MPDSR as a referral audit and feedback mechanism should be a precondition for scale-up funding, given the consistent evidence of its effectiveness in improving referral-form completeness and case fatality reduction.^{51,52,60} Third, ambulance and transport systems, including motorcycle ambulance innovations in rural areas, should be prioritised, with explicit attention to the abolition of out-of-pocket payments for emergency obstetric transport.^{38,43,45} Fourth, mHealth-enabled referral platforms should be integrated with national health information systems, with attention to interoperability, data privacy and gender-responsive design.^{46,55,56} The WHO recommendation on communication and referral for maternal and newborn health provides an evidence-informed policy framework for these investments.⁵⁶

Equity Considerations

Equity was a recurrent theme across the included records. In SSA, access to obstetric referral is patterned by gender, age, education, wealth quintile and urban-rural residence.^{13,15,40,54} Without explicit attention to these patterns, referral interventions risk widening rather than narrowing maternal health inequities. Koblinsky and colleagues have highlighted that quality maternity care for every woman everywhere requires explicit attention to the most marginalised.¹² Parkhurst and colleagues' analysis of access barriers to facility-based delivery in low-income settings identified the cost of transport, the perceived quality of care at referral facilities, and the gendered decision-making structures at household level as the principal barriers to equitable referral.²⁰ Adamu and Salihu's study in rural Nigeria reported that women in the poorest wealth quintile were three times more likely to experience delay in reaching care than those in the wealthiest quintile.⁴⁰ Bates and colleagues' analysis further emphasised that ineffective referral systems are themselves an important contributor to maternal mortality in SSA.⁴² Referral interventions designed with the most marginalised women in mind - using voice rather than text for low-literacy users, providing communal-access models where individual phone ownership is constrained, and prioritising the abolition of user fees for emergency obstetric transport - represent the most promising path to equity-promoting scale-up.^{20,40,42,57}

Methodological Gaps and Future Research

Five methodological gaps are notable. First, few of the included studies were randomised controlled trials; most were audits, cross-sectional studies or quasi-experimental designs with limited sample sizes and short follow-up. Second, very few studies reported on the cost or cost-effectiveness of referral interventions, limiting the ability of ministries of health to make allocatively efficient decisions. Third, equity-stratified outcomes were largely absent, preventing assessment of who benefits and who is left behind. Fourth, qualitative evaluations of women's and providers' experiences of the referral process were rare, despite the recognised importance of respectful maternity care. Fifth, the implementation and de-implementation of referral interventions were poorly documented, limiting generalisability. Priority research questions include: (i) multi-country cluster-randomised trials of integrated referral packages (protocol, communication, transport, MPDSR); (ii) equity-focused evaluations stratified by

wealth, education, age, urban-rural residence and disability; (iii) cost-effectiveness analyses using a societal perspective; (iv) mixed-methods evaluations of women's and providers' experiences of the referral process; and (v) implementation research on the de-implementation of ineffective referral practices.^{21,30,56,57,58}

CONCLUSION AND RECOMMENDATIONS

This scoping review has mapped the available evidence on prompt referral practices used as a strategy for the management of obstetric emergencies in sub-Saharan Africa. Six categories of referral practice dominate the evidence base: community-to-facility referrals by traditional birth attendants and community health workers; facility-to-facility referrals from primary to secondary or tertiary care; pre-referral communication and mHealth-enabled referral triggers; referral-form completeness and the content of pre-referral care; maternal and perinatal death surveillance and response as a referral audit mechanism; and cross-cutting themes of equity, ambulance systems, cost and implementation. Reported referral completion rates ranged from 43 to 81 percent, with mean transfer times of 65 to 180 minutes, and case fatality rates of 4.2 to 12.7 percent among referred women. Implementation barriers - cost, ambulance, human resources, communication, feedback - are remarkably consistent across settings, suggesting the value of a regional approach to referral investment and evaluation in West Africa.

For nursing and midwifery practice, we recommend the integration of structured obstetric referral training into pre-service curricula, the development of nursing-sensitive referral indicators, and the establishment of a regional referral reference group within the West African College of Nursing. For policy makers, we recommend explicit alignment of referral investments with the WHO EPMM strategy,⁵⁸ the institutionalisation of MPDSR as a referral audit mechanism, the prioritisation of ambulance and transport systems, and the integration of mHealth-enabled referral platforms with national health information systems.^{51,56} For researchers, we recommend multi-country cluster-randomised trials of integrated referral packages, equity-focused evaluations, cost-effectiveness analyses, and mixed-methods evaluations of women's and providers' experiences of the referral process. The limitations of this review include the restriction to records published in English, French or Portuguese; the exclusion of conference abstracts without full-text equivalents; the absence of formal quality appraisal, consistent with JBI scoping-review methodology;³⁵ and the possible omission of grey-literature sources not captured by the chosen information sources. The findings nonetheless provide an up-to-date evidence map for nursing, midwifery, policy and research stakeholders in West Africa and across SSA, and a baseline against which future progress can be measured.

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APPENDIX A: PRISMA-SCR CHECKLIST (TRICCO ET AL., 2018)

Table A1. PRISMA-ScR 22-item reporting checklist with location of reported content.

Item	Description	Reported
1	Title: Indicate that this is a scoping review	Yes (page 1)
2	Abstract: Structured summary	Yes (Abstract)
3	Rationale: Describe the rationale for the review	Yes (Introduction)
4	Objectives: State the research questions	Yes (Introduction: Aim)
5	Protocol: Indicate whether a protocol exists	Yes (Methods: Design)
6	Eligibility criteria: Specify inclusion/exclusion	Yes (Methods)
7	Information sources: Databases and other sources searched	Yes (Methods)
8	Search: Full search strategy (Appendix B)	Yes (Appendix B)
9	Selection process: Methods for screening	Yes (Methods: Selection)
10	Data charting: Process for charting data	Yes (Methods)
11	Charting items: List of items charted	Yes (Methods: Data Charting)
12	Critical appraisal of sources	Not applicable (scoping review)
13	Summary measures: How results were summarised	Yes (Methods: Synthesis)
14	Synthesis of results	Yes (Results: Themes)
15	Characteristics of sources of evidence	Yes (Results; Table 1)
16	Critical appraisal within sources of evidence	Not applicable
17	Results of individual sources of evidence	Yes (Results)
18	Synthesis of results of sources of evidence	Yes (Results: Themes)
19	Reporting: PRISMA-ScR reporting	Yes
20	Limitations: Limitations of the review	Yes (Conclusion)
21	Conclusions: Interpretation and implications	Yes (Discussion; Conclusion)
22	Funding: Sources of funding	Yes (Title page)

Figure A1. PRISMA-ScR Flow Diagram (textual representation)

Identification: Records identified through database searching (n = 2,184); PubMed/MEDLINE (n = 842), CINAHL (n = 287), Scopus (n = 451), African Index Medicus (n = 124), Google Scholar (n = 263), Grey literature (n = 217). Records after duplicates removed (n = 1,572).

Screening: Records screened by title and abstract (n = 1,572); records excluded (n = 1,278); full-text articles assessed for eligibility (n = 294).

Eligibility: Full-text articles excluded with reasons (n = 232): outside SSA (n = 98); no obstetric emergency or referral linkage (n = 47); protocol or opinion (n = 38); no referral practice in scope (n = 28); not retrievable (n = 21).

Included: Studies included in the scoping review (n = 62). Of these: 41 primary empirical studies, 12 systematic or scoping reviews, 9 institutional grey-literature reports.

Table 1. Characteristics of Selected Included Studies (Indicative)

Note: This table displays the principal characteristics of ten representative included studies. A full list of 62 included studies is available from the corresponding author on reasonable request.

Author, Year, Country	Design	Referral Model	Sample Size	Key Outcomes
Kongnyuy et al., 2009, Malawi	Criteria-based audit	Facility-to-facility	n = 312 referrals	MgSO ₄ use 41% to 78%
Murray & Pearson, 2019, LMICs	Systematic review	Multiple models	n = 48 studies	Modest effects on maternal mortality
Patel et al., 2016, LMICs	Systematic review	Community-based	n = 24 studies	Skilled birth attendance up, mortality inconclusive
Oyesanya et al., 2018, Nigeria	Cross-sectional	Facility-to-facility	n = 427 referrals	67% from PHCs, leading causes documented
Adeleye et al., 2016, Nigeria	Appraisal	Facility-to-facility	n = 235 referrals	Form completeness 38%
Fawole et al., 2017, Nigeria	Appraisal	Facility-to-facility	n = 412 referrals	Pre-referral care 22% WHO-compliant
Mpemba Nuuli et al., 2020, Uganda	Cross-sectional	Community-to-facility	n = 284 referrals	71% reached within 4h; 43% with comms
Awoyinka et al., 2015, Nigeria	Cross-sectional	Mixed	n = 510 women	Acceptability assoc. with education, spousal consent
Wilson et al., 2020, LMICs	Scoping review	mHealth ambulance	n = 19 studies	30-60 min reduction in transfer time
Olowokere et al., 2021, Nigeria	Mixed methods	MPDSR-linked	n = 173 deaths reviewed	68% deaths assoc. with sub-optimal referral

APPENDIX B: SAMPLE SEARCH STRATEGY (PUBMED/MEDLINE)

The following Boolean search string was executed in PubMed/MEDLINE in March 2025. Equivalent subject-heading and free-text adaptations were used for CINAHL, Scopus, African Index Medicus and grey-literature sources.

(obstetric OR maternal OR pregnancy OR labour OR "postpartum"[MeSH] OR "pregnancy complications"[MeSH]) AND (emergency OR complication OR haemorrhage OR "postpartum hemorrhage"[MeSH] OR eclampsia[MeSH] OR "pre-eclampsia"[MeSH] OR "obstructed labor" OR "puerperal sepsis"[MeSH] OR abortion[MeSH]) AND (referral OR transfer OR ambulance OR transport OR communication OR mHealth OR "mobile health" OR MPDSR OR surveillance OR "maternal death"[MeSH]) AND ("sub-Saharan Africa" OR Nigeria OR Ghana OR Kenya OR Tanzania OR Uganda OR Rwanda OR Burkina Faso OR Senegal OR Mali OR Ethiopia OR Mozambique OR Niger OR Malawi OR Zambia OR Zimbabwe OR "Cote d'Ivoire" OR Burundi OR Cameroon OR Benin OR Togo OR "Sierra Leone" OR Liberia OR Guinea)

Filters: Publication date 1 January 2015 to 31 March 2025; Species: Humans; Languages: English, French, Portuguese; Article types: Journal Article, Review, Systematic Review, Meta-Analysis.

CINAHL Headings adaptation: replace MeSH terms with equivalent CINAHL Headings (e.g., "Pregnancy Complications", "Referral and Consultation", "Obstetric Care", "Maternal-Child Health"). Scopus adaptation: use Emtree equivalents and TITLE-ABS-KEY field codes. African Index Medicus: search interface limited to free-text terms in title and abstract.