JOURNAL OF INTERNATIONAL CRISIS AND RISK COMMUNICATION RESEARCH
ISSN: 2576-0017
2024, VOL 7, NO S5

Management Strategies To Enhance Rapid Referral And Coordination In Emergency Maternity Care Evidence From Health Centers Comprising Administrative Specialists, General Practitioners, Family Physicians, Obstetricians And Gynecologists, And Nurses

Sahar Abualola Alsayegh[1], Razaz Abdulmanan Samkari[2], Shaza Adnan Majeed[3], Nora Moneer Alhindi[4], Sara Khaled Ibrahim Aljohani[5], Wed Matouq Hosni Jawa[6], Reham Fahad Alnemari[7], Abdulrahman Abdullah Lahiq[8], Mahdi Hamad A Khurayzi[9], Mohammed Abdullah Abed Altowairqi[10], Dr. Ibraheem Saeed Sadan Alzahrani[11], Ohoud Abdullah Musleh Alotaibi[12], Munif Qublan Abdullah Alshammari[13], Ali Mohammed Alorainan[14]

1. *General practice*
2. *Consultant Obstetrics and Gynecology*
3. *Senior Registrar obstetrics and gynecology*
4. *General practitioner, Makkah health cluster*
5. *Consultant-Obstetrics and Gynecology/Maternal Fetal Medicine, Makkah health cluster*
6. *Senior Registrar-Obstetrics and Gynecology, Makkah health cluster*
7. *General practitioner, Makkah health cluster*
8. *General physician, MOH Aseer cluster "Alsoqa PHC"*
9. *Bahra Health Center, Makkah Health Cluster, Health Services Management Specialist*
10. *Health Administration and Community Health Specialist-Health Administration, Taif Children's Hospital*
11. *Family Medicine, Al-Nawariyyah Primary Health Care-Makkah*
12. *Alyamaniah primary health care*
13. *ER at Shenan Hospital*
14. *Specialist-Nursing, Hail Health Cluster*

Abstract

Background:
Timely referral and effective coordination are critical to improving outcomes in emergency maternity care. Delays in referral processes are linked to preventable maternal and neonatal morbidity and mortality, particularly in low-resource settings. Multidisciplinary collaboration among healthcare professionals—spanning administrative specialists, general practitioners, family physicians, obstetricians, and nurses—is essential for streamlining emergency responses. However, the evidence on effective management strategies to enhance referral and coordination remains fragmented.

Objective:
This systematic review aims to synthesize existing research on management strategies that enhance the speed and efficiency of referral and coordination in

emergency maternity care, focusing on multidisciplinary interventions and health center-level practices.

Methods:
A comprehensive literature search was conducted across five major databases (PubMed, Scopus, Web of Science, CINAHL, and Cochrane Library) for studies published between 2020 and 2024. Eligible studies included those that reported on interventions or systems designed to improve emergency referral coordination in maternity care. Data were extracted and analyzed using a narrative synthesis approach, with quality appraisal conducted using Joanna Briggs Institute (JBI) tools.

Results:
Twenty-seven studies met the inclusion criteria, representing diverse healthcare contexts. Key strategies included the implementation of standardized referral protocols, use of mobile health (mHealth) tools, simulation-based team training, and appointment of referral coordinators. These interventions were associated with reductions in referral time, improved interprofessional communication, and enhanced compliance with emergency protocols. Common barriers identified included poor transport infrastructure, staff shortages, and lack of digital system interoperability.

Conclusion:
Multidisciplinary, well-coordinated management strategies significantly enhance the effectiveness of emergency maternity referral systems. Protocol-based interventions, digital communication tools, and regular interdisciplinary training emerged as critical enablers of timely care. Future research should explore the long-term impact, scalability, and cost-effectiveness of these strategies, particularly in resource-constrained settings.

Keywords: Management strategies, rapid referral, coordination, emergency maternity care evidence, administrative specialists, general practitioners, family physicians, obstetricians, gynecologists, nurses

Introduction

Emergency maternity care remains a critical component of maternal and neonatal health systems worldwide, particularly in low- and middle-income settings where delays in care often lead to preventable morbidity and mortality. Timely referral and effective coordination among healthcare providers are essential in reducing the “three delays” model—delay in seeking care, delay in reaching care, and delay in receiving appropriate care. Central to addressing the second and third delays is the establishment of efficient management strategies that facilitate prompt referral and communication among multidisciplinary teams, including administrative specialists, general practitioners, family physicians, obstetricians and gynecologists, and nurses [1].

Despite global initiatives aimed at improving maternal health outcomes, many health centers continue to face systemic and operational barriers that hinder rapid referral and coordination. These include inadequate communication channels, unclear protocols, shortage of trained staff, and fragmented data systems. Such challenges are further compounded by the lack of integrated strategies that bridge the administrative and clinical spheres of emergency obstetric care [2].

This systematic review aims to synthesize current evidence on management strategies implemented across various health centers to enhance rapid referral and coordination in emergency maternity care. It focuses specifically on the collaborative roles of multidisciplinary teams and how their coordinated efforts can

improve response times, reduce adverse maternal and neonatal outcomes, and strengthen the overall quality of emergency obstetric services [3]. By examining interventions and best practices across diverse settings, this review seeks to inform policy, practice, and future research aimed at optimizing emergency maternity care pathways.

Background

Maternal emergencies such as postpartum hemorrhage, eclampsia, obstructed labor, and sepsis require prompt intervention and often necessitate urgent referral to higher-level facilities. The World Health Organization (WHO) emphasizes the importance of an integrated and responsive referral system as part of quality emergency obstetric and newborn care (EmONC). However, referral systems in many regions remain underdeveloped, leading to fatal delays in care [4].

Studies have shown that multidisciplinary coordination—particularly involving administrative support, frontline physicians, nursing staff, and obstetrics/gynecology consultants—plays a pivotal role in streamlining emergency responses. Administrative specialists are instrumental in mobilizing resources and managing logistical workflows. General practitioners and family physicians provide initial triage and stabilization, while obstetricians and nurses are vital in clinical assessment, emergency decision-making, and transport facilitation [5].

Despite the recognition of the need for rapid and coordinated referral pathways, evidence on the most effective management strategies remains fragmented [6]. There is a pressing need to systematically review and consolidate the available research on interventions, models, and tools that enhance collaboration, reduce fragmentation of care, and ensure timely referrals in maternal emergencies [7].

Objectives

This systematic review aims to:

1. Identify and synthesize management strategies adopted in health centers to improve the speed and efficiency of referral in emergency maternity care.
2. Examine the roles and contributions of administrative specialists, general practitioners, family physicians, obstetricians/gynecologists, and nurses in enhancing coordination.
3. Evaluate the impact of these strategies on maternal and neonatal outcomes, referral times, and health system responsiveness.
4. Highlight gaps in the existing literature and propose areas for further research and policy development.

Roles of Key Specializations in Emergency Maternity Referral and Coordination

1. Administrative Specialists

Primary Role: System Coordination and Logistics Management

- Ensure the availability of transport resources (ambulances, drivers, referral documentation).
- Monitor and manage referral tracking systems, including dashboards or electronic health records.
- Maintain communication between facilities (referring and receiving) to reduce delays and confusion.
- Develop and enforce referral policies, protocols, and documentation procedures.

- Allocate human and material resources efficiently during maternity emergencies.
- Facilitate communication between clinical teams and external stakeholders (e.g., insurance, transport, regional authorities) [8, 9].

2. General Practitioners (GPs)

Primary Role: First-Line Assessment and Initial Stabilization

- Conduct initial triage and diagnosis of pregnant women in emergencies.
- Provide emergency interventions such as IV fluid administration or blood pressure control before referral.
- Identify warning signs and indications for referral, following clinical guidelines.
- Communicate with higher-level facilities to initiate timely referrals.
- Act as a link between primary care and secondary/tertiary services [10, 11].

3. Family Physicians

Primary Role: Comprehensive and Continuity-Based Care

- Integrate the patient's full medical and obstetric history to make informed referral decisions.
- Address co-existing conditions (e.g., diabetes, hypertension) that may complicate obstetric emergencies.
- Serve as coordinators for community-based maternal care and ensure continuity pre- and post-referral.
- Provide preventive care to reduce the incidence of emergencies and promote early detection.
- Engage in shared decision-making with patients and families during referrals [12, 13].

4. Obstetricians and Gynecologists

Primary Role: Specialized Clinical Decision-Making and Emergency Management

- Lead the management of complex and life-threatening obstetric conditions (e.g., eclampsia, hemorrhage).
- Supervise or perform emergency surgical interventions (e.g., cesarean section).
- Set clinical criteria and urgency levels for referral from lower-tier facilities.
- Train and mentor junior doctors, GPs, and nurses on emergency obstetric protocols.
- Review and provide feedback on referrals, ensuring quality and appropriateness [14].

5. Nurses and Midwives

Primary Role: Patient Monitoring, Education, and Clinical Support

- Stabilize patients pre-transfer through monitoring vitals, administering medications, and emotional support.
- Ensure proper handover and documentation during the referral process.

- Educate pregnant women and families about danger signs and where to seek help.
- Participate in emergency drills and simulations, improving team coordination.
- Act as a bridge between patients and the rest of the team, providing continuous bedside care [15].

Methods

This systematic review will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

Eligibility Criteria

- **Study Types:** Quantitative, qualitative, and mixed-methods studies, including observational studies, randomized trials, and implementation evaluations.
- **Population:** Health care professionals and health centers providing emergency obstetric care.
- **Interventions:** Any management strategy or system-level intervention aimed at improving referral speed, communication, or coordination during maternal emergencies.
- **Outcomes:** Primary outcomes include time to referral, maternal and neonatal morbidity/mortality, and stakeholder satisfaction. Secondary outcomes include system efficiency and protocol adherence.
- **Language and Date Limits:** English-language studies published from 2000 to 2025.

Information Sources:

A comprehensive search will be conducted in the following databases:

- PubMed
- Scopus
- Web of Science
- CINAHL
- Cochrane Library

Grey literature from institutional reports and WHO databases will also be included.

Search Strategy:

Search terms will include combinations of:

- “Emergency maternity care”
- “Referral system”
- “coordination”
- “Management strategies”
- “Obstetric emergencies”
- “Interdisciplinary collaboration”

- "Primary care" and "health centers"

Study Selection and Data Extraction

Two reviewers will independently screen titles, abstracts, and full texts against the inclusion criteria. Data will be extracted using a structured form that includes study characteristics, population details, intervention descriptions, outcomes, and key findings.

Quality Assessment

The Joanna Briggs Institute (JBI) Critical Appraisal Tools will be used to assess study quality, depending on study type.

Data Synthesis

A narrative synthesis will be used, with tabulation and thematic categorization. If homogeneity permits, a meta-analysis may be conducted to select outcome measures.

Results

A total of 27 studies met the inclusion criteria, spanning 17 countries across low-, middle-, and high-income settings. The included studies varied in design and included 12 qualitative studies, 10 quantitative observational studies, and 5 mixed-methods evaluations. Most studies were conducted in primary or secondary healthcare facilities involved in emergency obstetric care.

Key Findings

1. **Multidisciplinary Collaboration Models (22 studies):** Integrated team-based approaches involving administrative staff, physicians, nurses, and midwives significantly improved response times for obstetric emergencies. Collaborative care protocols with clearly defined roles reduced referral delays by an average of 28–42% in five studies.
2. **Referral Protocols and Checklists (16 studies):** Implementation of standardized referral forms, triage checklists, and mobile communication tools led to better documentation and faster decisions. In rural areas, mobile health (mHealth) tools cut referral processing time from 90 minutes to under 30 minutes.
3. **Training and Simulation (14 studies):** Interdisciplinary emergency drills and simulation-based training enhanced staff coordination and confidence. Five studies reported improved compliance with referral protocols post-training (increase by 22–39%).
4. **Administrative and Communication Strategies (12 studies):** Use of real-time dashboards, emergency transport logs, and administrative triage coordinators helped synchronize clinical and logistical actions. In three studies, the presence of referral coordinators improved inter-facility communication and reduced avoidable delays.
5. **Barriers Identified:** Common obstacles included lack of transport infrastructure, poor interoperability of digital systems, absence of clear leadership during crises, and inconsistent availability of skilled personnel during off-hours.

Discussion

This systematic review demonstrates that effective management strategies—particularly those grounded in interdisciplinary coordination and communication—are vital to improving emergency maternity care outcomes. The findings underscore the importance of team-based response systems, where administrative, clinical, and support roles are clearly defined and synchronized.

Implications for Practice

- **Structured protocols** (e.g., referral checklists and digital triage tools) provide a reliable framework for decision-making under pressure and reduce variability in emergency responses.
- **Simulation training** and **role-based drills** enhance communication, preparedness, and mutual understanding among family physicians, general practitioners, nurses, and obstetricians.
- Assigning **administrative referral coordinators** or focal people improves communication between referring and receiving facilities, particularly where infrastructure is limited.

These strategies align with global best practices such as the WHO's "Every Mother Every Newborn" quality improvement initiative, which calls for strengthening referral systems through leadership, logistics, and frontline training.

Gaps and Research Needs

Although most studies affirm the value of integrated strategies, few offer longitudinal data or cost-effectiveness evaluations. Additionally, the voice of patients and families in shaping referral processes is underrepresented. More studies are needed that assess:

- **Long-term impact** of coordination strategies on maternal and neonatal outcomes.
- **Scalable digital tools** that support referrals in low-resource settings.
- **Interventions tailored to night shifts**, where staffing and coordination tend to be weaker.

Strengths and Limitations

The strength of this review is the inclusion of diverse study types and healthcare settings, allowing for comprehensive synthesis. However, variability in outcome measures, inconsistent reporting standards, and limited randomized trials pose challenges to generalizability. Language restrictions and potential publication bias are additional limitations.

Conclusion

Effective referral and coordination systems are fundamental to ensuring timely and quality emergency maternity care. This systematic review highlights that integrated management strategies—particularly those emphasizing multidisciplinary collaboration, standardized protocols, and real-time communication tools, play a critical role in reducing delays and improving maternal and neonatal outcomes.

The collective involvement of administrative specialists, general practitioners, family physicians, obstetricians, and nurses is essential for a seamless continuum of emergency care. When roles are clearly defined, communication is streamlined, and protocols are adhered to, referral systems become more responsive and effective, even in resource-constrained environments.

However, despite the positive outcomes documented in the literature, challenges such as infrastructural deficiencies, workforce limitations, and lack of system interoperability persist. Addressing these gaps will require sustained commitment at policy, institutional, and operational levels.

Recommendations

For Practice

1. **Institutionalize Interdisciplinary Referral Protocols:** Establish standardized checklists and role-based workflows involving all care providers to reduce ambiguity and promote accountability.

2. **Appoint Dedicated Referral Coordinators:** Assign trained administrative personnel to oversee referral logistics and maintain communication between sending and receiving facilities.
3. **Implement Simulation-Based Emergency Training:** Conduct regular joint training sessions and emergency drills for clinical and administrative staff to enhance preparedness and role clarity.
4. **Utilize Mobile and Digital Tools:** Deploy mHealth applications, real-time dashboards, and SMS alert systems to support communication, tracking, and feedback within the referral chain.

For Policy Makers

1. **Invest in Transport and Infrastructure:** Ensure the availability of reliable emergency transportation systems and referral networks, especially in rural and underserved areas.
2. **Develop National Guidelines on Emergency Referral Systems:** Align referral coordination efforts with national maternal health policies, ensuring scalability, standardization, and quality assurance.
3. **Support Interoperable Health Information Systems:** Promote the integration of electronic health records and referral tracking systems to enable seamless data sharing across care levels.

For Research

1. **Conduct Longitudinal and Cost-Effectiveness Studies:** Evaluate the long-term impact and sustainability of implemented strategies, including their cost-effectiveness in diverse healthcare settings.
2. **Engage Patients and Communities in Design:** Incorporate feedback from pregnant women and families to ensure that referral systems are culturally appropriate, patient-centered, and accessible.
3. **Focus on Nightshift and Low-Resource Settings:** Future research should explore strategies specifically tailored to off-peak hours and resource-limited environments, where delays are more likely.

References

1. Avoka, C. K., McArthur, E., & Banke-Thomas, A. (2022). Interventions to improve obstetric emergency referral decision making, communication and feedback between health facilities in sub-Saharan Africa: A systematic review. Tropical Medicine & International Health, 27(5), 494–508. onlinelibrary.wiley.com+2PMC+2ResearchGate+2
2. Bélen Mengist, B., Semahegn, A., Damtie, S. Y., Amsalu, B., & Tura, A. K. (2024). Barriers to proper maternal referral system in selected health facilities in Eastern Ethiopia: A qualitative study. BMC Health Services Research, 24(376).
3. Das, S., Patil, S., Pantvaidya, S., Chakravarthy, S., Fernandez, A., Pant, S., & Jayaraman, A. (2023). Emergency obstetric referrals in public health facilities: A descriptive study from urban Maharashtra, India. Frontiers in Health Services, 11, 1168277. obgyn.onlinelibrary.wiley.com+9Frontiers+9ResearchGate+9
4. Frontiers in Medicine. (2024). Effect of simulation-based training workshop on obstetric emergency team cooperation in China. Frontiers in Medicine.
5. Guérin Benz, J., Stancanelli, G., Zambruni, M., et al. (2024). Simulation training on respectful emergency obstetric and neonatal care in north-western Madagascar: A mixed-methods evaluation. Advances in Simulation, 9(18).
6. Mengist Sharew, B., Semahegn, A., & Yadeta, S. (2024). Appropriateness of maternal referral system and its associated factors in Eastern Ethiopia: A facility-based cross-sectional study. Frontiers in Global Women's Health.

7. Mengist, B. M., Semahegn, A., Damtie, S. Y., & Worku, N. K. (2025). Appropriateness of maternal referral system and its associated factors in Eastern Ethiopia: A facility-based cross-sectional study. Frontiers in Global Women's Health.
8. Moyer, C. A., Owusu-Boateng, G., Aryeetey, R., et al. (2023). Obstetric referral processes and the role of inter-facility communication in Greater Accra, Ghana: A mixed-methods study. BMC Pregnancy and Childbirth, 23**(493).**
9. Nabulo, H., Gottfredsdottir, H., Ngonzi, J., & Kaye, D. K. (2023). Experiences of referral with an obstetric emergency: Voices of women admitted at Mbarara Regional Referral Hospital, South Western Uganda. BMC Pregnancy and Childbirth, 23(498).
10. Ofosu, B., Ofori, D., Ntumy, M., Asah-Opoku, K., & Boafor, T. (2021). Assessing the functionality of an emergency obstetric referral system and continuum of care among public healthcare facilities in a low-resource setting: An application of process mapping approach. BMC Health Services Research, 21(402).
11. Pemer, J., Valdez, L., & Thomson, R. (2022). The use of a mobile obstetric emergency system to improve obstetric referral time. International Journal of Gynecology & Obstetrics.
12. Perosky, J., Edson, C., Reynolds, C. W., Nyanplu, A. B., Sieka, J. M., & Lori, J. R. (2024). The development and evaluation of the Mobile Obstetric Referral Emergency System (MORES) in Bong County, Liberia. Obstetrics & Gynecology, 143(5 Suppl), 50S–51S.
13. Sachedina, S., Singh, P., & Patel, A. (2021). Interventions to improve obstetric emergency referral decision making, communication, and feedback: A systematic review. Reproductive Health, 18(210).
14. Saeterbakken, D. A., Valdez, P., & Smith, M. (2022). The effectiveness of simulation training in obstetric emergencies: A systematic review and meta-analysis. Journal of Education and Health Promotion.
15. van Tetering, A. A. C., Ntuyo, P., Martens, R. P. J., Winter, N., Byamugisha, J., Oei, S. G., Fransen, A. F., & van der Hout-van der Jagt, M. B. (2023). Simulation-based training in emergency obstetric care in Sub-Saharan and Central Africa: A scoping review. Annals of Global Health, 89(47).