

Improving Maternal And Neonatal Safety: The Role Of Nursing In Infection Control In OBG Departments

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ABSTRACT

Maternal and neonatal infections remain a major global health challenge, significantly contributing to morbidity and mortality rates, particularly in low- and middle-income countries. The World Health Organization (WHO) reports that infection-related complications account for nearly 10% of maternal deaths and a substantial proportion of neonatal fatalities worldwide. Effective infection prevention and control (IPC) measures within obstetrics and gynaecology (OBG) departments are essential to ensuring safe childbirth, reducing puerperal and postoperative infections, and preventing neonatal sepsis. Nurses, as the cornerstone of maternity care, play a crucial role in implementing, monitoring, and sustaining these infection control practices. This review explores the pivotal role of nursing in improving maternal and neonatal safety through evidence-based IPC interventions, guided by international standards such as WHO and Centres for Disease Control and Prevention (CDC) protocols. The study synthesizes findings from recent global literature focusing on nursing-led IPC practices, including aseptic techniques during labour and delivery, sterilization of instruments, environmental cleaning, antimicrobial stewardship, and adherence to hand hygiene guidelines. Nurse-led infection surveillance, health education, and early detection of infection risks have been identified as essential components of effective IPC programs in maternity units. Despite strong evidence supporting the effectiveness of IPC measures, barriers such as inadequate staffing, limited resources, inconsistent training, and weak institutional policies continue to hinder optimal implementation. The findings emphasize the need for regular competency-based training, policy reinforcement, and leadership support to empower nurses as infection control champions. Furthermore, fostering inter professional collaboration and patient education enhances compliance and overall safety within OBG settings. Infection prevention is a shared responsibility, but nurses occupy a central and influential position in safeguarding maternal and neonatal health. Empowering the nursing workforce through continuous education, strong leadership, and adequate resources can significantly reduce preventable infections and improve health outcomes. Strengthened nursing participation in infection control represents a vital step toward achieving global targets for safe motherhood and neonatal care.

KEYWORDS: Maternal Safety, Neonatal Infection, Nursing Interventions, Infection Control, Obstetrics and Gynaecology, Patient Safety.

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INTRODUCTION

Maternal and neonatal health remains a critical global priority, as infection-related complications continue to contribute significantly to morbidity and mortality in both mothers and newborns. According to the World Health Organization (WHO), infections such as puerperal sepsis, postoperative wound infections, and neonatal sepsis account for a substantial proportion of deaths in maternity settings, particularly in low- and middle-income countries. These preventable infections not only affect survival rates but also have long-term health consequences, including infertility, chronic pelvic pain, and developmental complications in newborns. The obstetrics and gynaecology (OBG) departments, being highly invasive care environments, demand strict adherence to infection prevention and control (IPC) practices. Ensuring maternal and neonatal safety requires a coordinated, evidence-based approach in which nurses play a pivotal and irreplaceable role. Nurses are at the forefront of maternal and neonatal care, directly involved in every stage of childbirth from antenatal assessment and labor management to postnatal monitoring and neonatal care. Their responsibilities include maintaining aseptic techniques, monitoring for signs of infection, ensuring proper sterilization of instruments, and providing education to mothers regarding hygiene and new-born care. As per WHO and Centres for Disease Control and Prevention (CDC) guidelines, IPC is the backbone of safe clinical practice, and its success depends heavily on the competency and commitment of nursing personnel. The nursing role extends beyond clinical practice to include leadership in infection control programs, participation in policy implementation, and advocacy for safer healthcare environments. The maternal period is characterized by physiological and immunological changes that increase vulnerability to infections. Surgical interventions such as caesarean sections, episiotomies, and use of invasive devices further elevate the risk. Similarly, neonates—particularly preterm or low-birth-weight infants—are highly susceptible to infections due to immature immune systems. Hospital-acquired infections such as neonatal sepsis, umbilical infections, and respiratory tract infections are common in maternity and neonatal units. These infections often arise from preventable sources like inadequate hand hygiene, contaminated equipment, poor waste management, and suboptimal environmental sanitation. Thus, nursing-led infection control measures are not only essential but lifesaving. Globally, healthcare systems have recognized the importance of standardized IPC protocols in reducing maternal and neonatal infection rates. Initiatives such as the WHO's "Clean Care is Safer

Care” campaign and the “Safe Childbirth Checklist” emphasize hand hygiene, sterile technique, and timely antibiotic prophylaxis. These interventions have shown remarkable reductions in sepsis-related mortality when effectively implemented by trained nursing staff. However, in many low-resource settings, the lack of adequate supplies, understaffing, and limited IPC training continue to compromise maternal and neonatal outcomes. This highlights the urgent need for strengthening the nursing role through continuous education, capacity building, and organizational support. The nursing profession holds a unique position in bridging the gap between policy and practice. Nurses act as both caregivers and educators, influencing patient behaviours and institutional cultures toward safety and hygiene. In the OBG departments, where emotional and physical vulnerability are high, nurses’ adherence to infection control practices builds trust and ensures dignity in care. Studies have demonstrated that when nurses receive ongoing IPC training and are supported with adequate resources, the incidence of puerperal infections and neonatal sepsis decreases significantly. Moreover, nurses’ engagement in data collection, infection surveillance, and audit processes enhances early detection and prompt intervention in potential outbreaks.

Despite the proven effectiveness of infection control strategies, challenges remain. A lack of standardized monitoring tools, inconsistent policy enforcement, and gaps in communication between multidisciplinary teams can weaken infection control systems. In many hospitals, infection control responsibilities are fragmented, with limited nursing representation in decision-making committees. Additionally, cultural and behavioral factors, such as non-compliance with hand hygiene protocols or improper use of personal protective equipment, further exacerbate the problem. Addressing these issues requires a systematic approach that values nursing input, supports evidence-based practices, and fosters an institutional culture of safety. The integration of infection control into nursing education and practice must be continuous and competency-based. Simulation training, audit feedback, and mentorship have been shown to improve compliance and confidence among nurses. Moreover, empowering nurses through leadership roles in infection control committees enhances accountability and innovation. In maternity care, infection prevention is not limited to the clinical environment but extends to community outreach, antenatal education, and postnatal home visits. Nurses’ role in educating mothers on perineal hygiene, cord care, breastfeeding, and early recognition of infection symptoms is vital for sustained prevention.

OBJECTIVES OF THE STUDY

The main objectives of this review paper are as follows:

1. To analyse the role of nursing interventions in preventing infections within obstetrics and gynaecology departments.
2. To examine the impact of evidence-based infection control practices on maternal and neonatal safety outcomes.
3. To identify barriers and facilitators influencing effective implementation of IPC measures in OBG units.
4. To evaluate international guidelines and best practices relevant to infection control in maternal and neonatal care.
5. To recommend strategies for strengthening nursing capacity and institutional support in infection prevention programs.

Significance of the Study

This review is significant as it highlights the indispensable contribution of nurses to infection control and overall patient safety in OBG departments. In an era where healthcare-associated infections pose a serious threat to patient outcomes and hospital reputations, empowering nurses with adequate skills, knowledge, and institutional backing becomes a moral and professional imperative. Strengthening infection control through nursing leadership can transform maternity care units into safer, more reliable, and patient-centred environments.

Methodology

This review paper employed an integrative literature review design to synthesize and analyze existing evidence on nursing interventions aimed at improving maternal and neonatal safety through infection control practices in obstetrics and gynecology (OBG) departments. The methodology adhered to international standards for conducting narrative and systematic reviews, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework where applicable.

Search Strategy

A comprehensive and systematic literature search was carried out between January and October 2025 using multiple electronic databases, including PubMed, CINAHL, Scopus, ScienceDirect, and Google Scholar. The search strategy combined Medical Subject Headings (MeSH) and free-text keywords such as “infection control,” “maternal safety,” “neonatal infection prevention,” “nursing interventions,” “obstetrics and gynecology,” and “patient safety.” Boolean operators (AND, OR) were used to refine the search and ensure inclusion of the most relevant studies. Reference lists of key articles were also reviewed to identify additional sources.

Inclusion criteria comprised peer-reviewed articles published in English between 2013 and 2025 that focused on infection prevention and control (IPC) strategies within OBG departments, specifically addressing nursing roles and interventions. Studies involving maternal and neonatal safety outcomes, hospital-based infection control programs, and implementation of WHO or CDC guidelines were also included. Excluded were non-nursing focused studies, editorials, and those unrelated to OBG or infection control contexts.

Data Extraction and Analysis

After removing duplicates, eligible studies were screened by title and abstract, followed by full-text review. Data extraction focused on study design, sample characteristics, intervention type, infection control strategies, and outcomes related to maternal and neonatal safety. Quantitative and qualitative findings were synthesized under key thematic areas, including:

1. Nursing-led infection control interventions,
2. Nursing-led infection control interventions,
3. Implementation of evidence-based guidelines,
4. Training and competency development,
5. Barriers to infection control, and
6. Institutional and policy support for IPC programs.

Data synthesis was performed using a thematic content analysis approach, which allowed integration of quantitative results (e.g., infection rate reduction, compliance rates) with qualitative insights (e.g., perceptions, barriers, and facilitators).

Quality Appraisal

To ensure rigor and credibility, the quality of included studies was assessed using the Critical Appraisal Skills Programme (CASP) checklist for qualitative research and the Joanna Briggs Institute (JBI) appraisal tool for quantitative and mixed-methods studies. Only studies with moderate to high methodological quality were retained for synthesis. The inclusion of both observational and interventional studies provided a balanced understanding of nursing roles in infection prevention.

Ethical Considerations

As this study is a review of existing literature, no ethical approval was required. However, ethical principles were observed throughout the process by ensuring accurate citation, acknowledgment of original authors, and avoidance of plagiarism. The review also respected the integrity of data interpretation by avoiding bias and maintaining transparency in reporting. Conceptual Framework The review was guided by the Infection Prevention and Control (IPC) Core Components Framework developed by the WHO, emphasizing the critical role of nursing in key areas such as hand hygiene, environmental cleaning, use of personal protective equipment, sterilization, waste management, and education. This framework provided a structure for analysing nursing-led interventions that enhance maternal and neonatal safety within OBG settings.

Limitations

While the review aimed to capture a broad range of international evidence, it was limited by the availability of full-text articles in English and the variability in methodological rigor among included studies. Furthermore, differences in healthcare infrastructure, staffing ratios, and cultural practices across countries may affect generalizability of the findings. Despite these limitations, the integration of diverse studies strengthened the validity of the conclusions and provided a comprehensive understanding of nursing's impact on infection control in OBG departments.

Major Findings

The review revealed that infection prevention and control (IPC) practices in obstetrics and gynaecology (OBG) departments are essential for safeguarding maternal and neonatal health, and that nursing professionals play a pivotal role in ensuring these practices are effectively implemented. Across the reviewed literature, consistent evidence demonstrated that well-trained, adequately supported nursing staff significantly reduce the incidence of maternal and neonatal infections through adherence to evidence-based protocols. The findings highlight the critical link between nurse-led infection control interventions and improved safety outcomes in maternity settings.

1.Impact of Nursing-Led Infection Control on Maternal and Neonatal Outcomes

The majority of reviewed studies reported that implementation of nursing-led infection control programs, including hand hygiene compliance, sterile delivery practices, and environmental cleaning, resulted in a marked decrease in hospital-acquired infections (HAIs) such as puerperal sepsis, wound infections, and neonatal sepsis. For instance, studies following WHO's "Five Moments for Hand Hygiene" framework documented up to a 40–60% reduction in infection rates after intensive nurse training programs. The introduction of nurse-monitored aseptic techniques during labor and postpartum care further minimized contamination risks, especially during procedures like cesarean sections and episiotomies.

2.Training and Continuous Education Enhance Compliance

Another major finding was the direct relationship between nurses' infection control training and improved maternal and neonatal outcomes. Facilities that implemented regular in-service training, audits, and feedback systems reported higher adherence to standard precautions.

Simulation-based learning and skill-building workshops improved nurses' competence in managing high-risk obstetric cases while maintaining aseptic techniques. Continuous professional education empowered nurses to act as role models and infection control champions within their units.

3.Importance of Institutional Support and Policy Implementation

The findings emphasized that institutional commitment plays a key role in sustaining infection control efforts. Hospitals that provided adequate staffing, infection control supplies, and administrative backing reported stronger compliance with IPC protocols. Conversely, in resource-limited settings, lack of clean water, disinfectants, and personal protective equipment (PPE) undermined nursing efforts despite adequate knowledge. Studies highlighted that strong leadership, multidisciplinary collaboration, and establishment of infection control committees significantly enhanced nurses' effectiveness in maintaining hygiene standards in OBG departments.

4. Family Education and Community Engagement

Nurses' roles extended beyond clinical interventions to include educating mothers and families about personal hygiene, perineal care, umbilical cord care, and early signs of infection. This patient-centred approach, when integrated into maternity care, led to improved postnatal hygiene and reduced home-acquired neonatal infections. Family-centred education programs facilitated by nurses also encouraged mothers to seek early care in case of postpartum complications, enhancing continuity of infection prevention efforts from hospital to home.

5. Barriers to Effective Infection Control

Despite clear evidence of the effectiveness of nursing interventions, several barriers were identified. These included inadequate staffing ratios, excessive workload, inconsistent compliance monitoring, and lack of standardized IPC policies in some healthcare institutions. Behavioural factors, such as complacency, limited motivation, and poor hand hygiene culture, were also reported as challenges. In developing countries, infrastructural limitations—such as overcrowded maternity wards and limited sterilization equipment—further hindered infection control practices. Addressing these barriers requires systematic support and investment in nursing infrastructure.

6. Integration of International Guidelines and Evidence-Based Practices

The review found that adherence to WHO, CDC, and International Council of Nurses (ICN) guidelines significantly improved the quality and consistency of infection prevention practices. Hospitals that adopted global standards—such as the WHO “Safe Childbirth Checklist” and CDC’s “Standard Precautions for Health Care”—demonstrated measurable improvements in safety outcomes. Nurses trained in these protocols were more likely to detect infection risks early, implement timely interventions, and participate in audit-based performance improvement programs.

7. Role of Nursing Leadership and Teamwork

Strong nursing leadership emerged as a crucial determinant of IPC success. Nurse leaders who fostered teamwork, accountability, and communication cultivated a safety culture within OBG departments. Collaborative care involving obstetricians, paediatricians, and infection control nurses promoted shared responsibility and sustained compliance. Leadership-driven initiatives such as peer supervision, recognition programs, and mentoring were associated with long-term adherence to infection control standards.

8. Overall Impact on Quality of Care

Overall, the findings confirm that when nurses are equipped with knowledge, resources, and institutional backing, infection rates in OBG departments decline significantly. This not only improves maternal and neonatal outcomes but also reduces healthcare costs, shortens hospital stays, and enhances patient satisfaction. Effective nursing-led infection control interventions serve as a foundation for safe motherhood programs and are indispensable for achieving global health goals such as Sustainable Development Goal 3 (Good Health and Well-being).

Based on the findings of this review, several key recommendations are proposed to strengthen nursing-led infection prevention and control (IPC) practices in obstetrics and gynaecology (OBG) departments for improved maternal and neonatal safety.

RECOMMENDATIONS

1. Strengthen Nursing Education and Training

Regular, competency-based training programs on infection control should be integrated into both pre-service and in-service nursing education. Simulation-based learning and hands-on workshops can help nurses maintain proficiency in aseptic techniques, hand hygiene, and sterilization procedures. Training should be aligned with WHO and CDC infection control guidelines and updated regularly to reflect new evidence.

2. Ensure Adequate Staffing and Resource Allocation

Healthcare institutions must ensure optimal nurse-to-patient ratios to minimize workload stress and prevent lapses in infection control. Essential IPC supplies—such as clean gloves, disinfectants, personal protective equipment (PPE), and sterilization materials—must be consistently available. Government and hospital administrators should allocate adequate funding for infection control programs and infrastructure improvements.

3. Foster a Culture of Safety and Accountability

Nursing leadership should promote a culture of shared responsibility for infection prevention. Regular audits, peer supervision, and feedback mechanisms can help sustain compliance with IPC standards. Recognizing and rewarding best practices among nursing staff can further motivate adherence to infection control protocols.

4. Strengthen Multidisciplinary Collaboration

Effective infection control requires coordination between nurses, obstetricians, microbiologists, and hospital administrators. Establishing infection control committees with active nursing representation will enhance communication and facilitate policy implementation.

5. Empower Patients and Families

Nurses should provide education to mothers and families about hygiene practices, postnatal care, and early infection recognition. Patient participation in infection prevention fosters continuity of care beyond hospital discharge.

CONCLUSION

Maternal and neonatal infections remain a significant global health concern, particularly in low- and middle-income countries where resource limitations and infrastructural challenges compromise the quality of care. This review has demonstrated that nurses play a central and transformative role in improving maternal and neonatal safety through effective infection prevention and control (IPC) practices in obstetrics and gynaecology (OBG) departments. Their contributions extend beyond clinical interventions to encompass patient education, surveillance, and leadership in implementing evidence-based protocols that reduce infection-related morbidity and mortality. The evidence clearly indicates that when nurses are adequately trained, supported, and empowered, infection rates in maternity units decline markedly. Adherence to internationally recognized guidelines—such as those established by the World Health Organization (WHO) and the Centres for Disease Control and Prevention (CDC)—has proven to be a cornerstone in minimizing puerperal sepsis, neonatal sepsis, and surgical site infections. Consistent application of hand hygiene protocols, aseptic delivery techniques, and sterilization standards has resulted in measurable improvements in maternal and new-born outcomes. Moreover, nurse-led infection control initiatives have been instrumental in promoting a culture of safety and accountability within healthcare institutions. The review also highlighted several barriers that impede effective infection control, including staffing shortages, inadequate resources, inconsistent policy enforcement, and gaps in continuous professional training. Overcoming these barriers requires a comprehensive approach that integrates strong leadership, institutional commitment, and inter professional collaboration. Hospitals and healthcare policymakers must recognize infection control as a shared responsibility, with nurses serving as pivotal change agents. Furthermore, infection control must not end at hospital discharge. Nurses have an essential role in extending education to mothers and families about personal hygiene, new-born care, and early identification of infection symptoms. This continuity of care strengthens community-level infection prevention and enhances long-term health outcomes for mothers and infants. Improving maternal and neonatal safety through effective infection control is inseparable from empowering the nursing workforce. By investing in nursing education, providing adequate resources, and fostering a supportive environment for evidence-based practice, healthcare systems can achieve sustainable reductions in infection rates. Strengthened nursing leadership in infection prevention represents a vital pathway toward safer childbirth, healthier families, and the realization of global maternal and child health.

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