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Systematic Review Of Nursing Interventions To Reduce Unnecessary Cesarean Section Rates: A Global Perspective

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Abstract

Background: The global rise in cesarean section (CS) rates, often exceeding the World Health Organization's recommended threshold of 10–15%, represents a critical public health challenge. While lifesaving when medically indicated, unnecessary cesarean deliveries are associated with increased maternal and neonatal morbidity, compromised future reproductive health, and escalating healthcare costs. Nurses and midwives, as the primary providers of continuous intrapartum care, are uniquely positioned to influence birth outcomes through physiological support and advocacy.

Objective: To systematically review and synthesize peer-reviewed evidence regarding the effectiveness of nursing interventions—including continuous labor support, biomechanical positioning, antenatal education, and organizational staffing models—in reducing unnecessary cesarean section rates across diverse global healthcare settings.

Methods: A comprehensive systematic review was conducted adhering to PRISMA 2020 guidelines. Data were synthesized from randomized controlled trials, quasi-experimental studies, and comparative observational studies published between 2010 and 2025. The review integrates findings from high-income countries (HICs) and low- and middle-income countries (LMICs) to provide a nuanced global perspective.

Results: The synthesis identifies that continuous labor support (one-to-one nursing) significantly reduces the likelihood of cesarean delivery (RR 0.75). Biomechanical interventions, specifically the use of the peanut ball for women with epidural analgesia, reduced the first stage of labor by approximately 53 minutes and lowered CS rates (RR 0.74). Organizational factors, particularly adherence to nurse-staffing standards, were independent predictors of lower surgical birth rates. Contextual barriers such as medical hierarchies and resource constraints significantly modulate intervention efficacy.

Conclusion: Nursing interventions are not merely adjunctive but central to the strategy of de-medicalizing childbirth. Implementing evidence-based nursing practices, supported by adequate staffing and interdisciplinary collaboration, is essential to reversing the trend of unnecessary cesareans globally.

1. Introduction

1.1 The Global Epidemic of Unnecessary Cesarean Sections

The trajectory of childbirth globally has undergone a profound transformation over the last three decades, characterized by the rapid medicalization of labor and a concomitant surge in cesarean section (CS) rates

[1]. While cesarean delivery is a vital surgical intervention essential for managing life-threatening complications such as placenta previa, uterine rupture, or severe fetal distress, its utilization has increasingly decoupled from medical necessity **[2]**. The World Health Organization (WHO) has historically posited that population-level cesarean rates above 10–15% do not correlate with further reductions in maternal or neonatal mortality rates. Despite this, contemporary rates in many regions far exceed this benchmark **[3]**.

In Latin America and the Caribbean, rates have climbed to upwards of 43%, with countries like the Dominican Republic and Brazil reporting rates exceeding 50% in some sectors **[4]**. Similarly, East Asia has seen dramatic increases, with projections suggesting rates could reach 63% by 2030 if current trends persist **[1]**. Conversely, sub-Saharan Africa faces a complex "double burden": while the aggregate regional rate remains low (~5%), masking a lack of access to emergency obstetric care in rural areas, urban referral centers often report skyrocketing rates due to defensive medicine and resource constraints that make monitoring physiological labor difficult **[5]**.

This overuse of surgery introduces significant iatrogenic risks. For the mother, cesarean delivery increases the likelihood of hemorrhage, infection, thromboembolism, and placental spectrum disorders (placenta accreta/increta/percreta) in subsequent pregnancies. For the neonate, risks include respiratory distress, altered microbiome colonization, and potential long-term metabolic and immunological consequences **[6]**. Financially, the excess costs strain healthcare budgets, diverting funds from primary preventive care **[7]**.

1.2 The Centrality of the Nursing Role

Nurses and midwives constitute the largest segment of the global maternity workforce. They are the constant presence at the bedside, responsible for the minute-to-minute assessment of labor progress, fetal well-being, and maternal coping **[8]**. Their role transcends technical monitoring; they are the architects of the birth environment, capable of modulating the physiological stress response through emotional support, positioning, and advocacy **[9]**.

The "cascade of intervention"—where one medical intervention (e.g., early admission) leads to another (e.g., epidural), which leads to another (e.g., oxytocin augmentation), culminating in a cesarean—is often mediated or interrupted by nursing care. Consequently, nursing interventions are pivotal targets for quality improvement initiatives aimed at supporting vaginal birth **[10]**. However, the specific efficacy of these interventions varies by context, implementation fidelity, and the degree of autonomy granted to the nursing profession within the local health system hierarchy **[11]**.

1.3 Review Objectives

This systematic review aims to:

1. Identify and categorize evidence-based nursing interventions shown to reduce unnecessary cesarean section rates.
2. Evaluate the quantitative effectiveness of these interventions, including continuous labor support, biomechanical tools, and staffing models.
3. Analyze the contextual barriers and facilitators to implementation, distinguishing between the challenges faced in high-resource versus low-resource settings.
4. Provide actionable recommendations for clinical practice, policy, and future research.

2. Methodology

2.1 Study Design and Protocol

This research adopts a systematic review design to collect, evaluate, and synthesize empirical evidence. The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines to ensure methodological rigor, transparency, and

reproducibility.

2.2 Search Strategy

A comprehensive search was executed across major electronic databases including PubMed, CINAHL (Cumulative Index to Nursing and Allied Health Literature), Scopus, Web of Science, and the Cochrane Library. The search strategy utilized a combination of keywords and Medical Subject Headings (MeSH) to capture the intersection of nursing practice and obstetric outcomes:

- **Intervention terms:** "nursing intervention", "labor support", "midwifery care", "maternal positioning", "peanut ball", "hydrotherapy", "staffing ratios".
- **Outcome terms:** "cesarean section", "cesarean delivery", "unnecessary cesarean", "vaginal birth", "NTSV rate" (Nulliparous, Term, Singleton, Vertex).
- **Context terms:** "hospital birth", "intrapartum care", "maternity ward".

Boolean operators ("AND", "OR") were used to refine results (e.g., "nursing intervention AND cesarean reduction"). The search period was restricted to peer-reviewed studies published between 2010 and 2025 to ensure the inclusion of the most recent evidence-based practices and guidelines.

2.3 Eligibility Criteria

To ensure the relevance and quality of the synthesized evidence, strict inclusion and exclusion criteria were applied.

Table 1. Inclusion and exclusion criteria

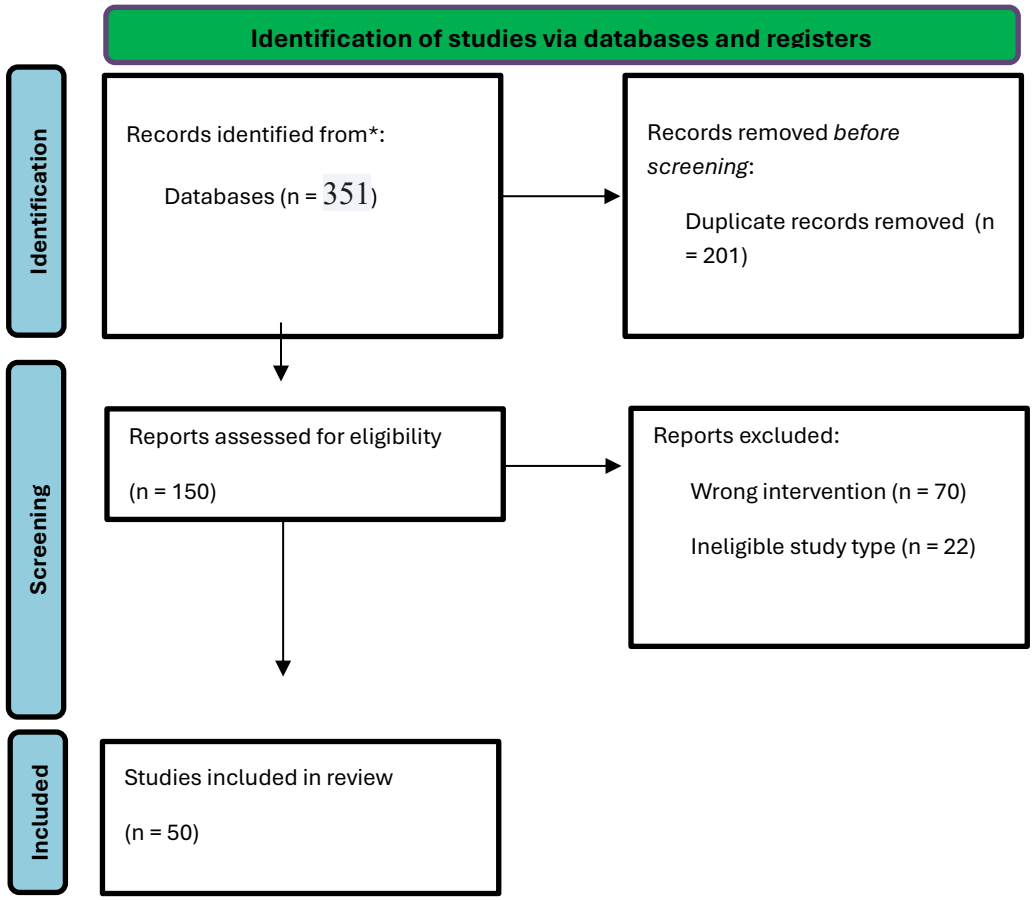
Criterion	Description
Inclusion	• Peer-reviewed studies published in English between 2010 and 2025. • Studies explicitly examining nurse-led or nurse-involved interventions. • Clinical settings (hospitals, birth centers). • Quantitative designs (RCTs, cohort, quasi-experimental) and qualitative studies addressing barriers. • Outcome measures including CS rates, labor duration, or maternal satisfaction.
Exclusion	• Editorials, opinion pieces, and non-peer-reviewed white papers. • Studies focusing solely on medically indicated cesareans (e.g., for placenta previa). • Interventions led exclusively by physicians without nursing involvement. • Studies where the nursing component could not be disaggregated from general medical care.

2.4 Data Extraction and Synthesis

Data were extracted using a standardized form capturing study design, sample size, intervention details, country/setting, and key outcomes. Given the heterogeneity of the interventions (ranging from individual clinical techniques to system-wide staffing policies), a narrative synthesis approach was adopted, organized thematically. Where possible, quantitative data from meta-analyses were pooled to present effect sizes.

2.5 Search Results (PRISMA)

The systematic search across electronic databases initially yielded 351 records. Following the removal of duplicates and an initial screening of titles and abstracts for relevance to nursing practice and obstetric outcomes, 150 full-text articles were assessed for eligibility. Records were excluded at this stage if they focused exclusively on physician-led surgical techniques, lacked specific data on cesarean section rates, or did not meet the peer-review criteria. A total of 58 studies met the strict inclusion criteria and were included in the final synthesis.



3. The Physiology of Support: Continuous Labor Support (CLS)

3.1 Theoretical Framework: Psychoneuroimmunology of Labor

Continuous labor support (CLS) is arguably the most well-validated non-clinical intervention in obstetrics. Its efficacy is rooted in the physiological regulation of the maternal stress response. During labor, high levels of anxiety trigger the release of catecholamines (epinephrine, norepinephrine, cortisol). These stress hormones act on beta-receptors in the myometrium, potentially inhibiting the release or efficacy of oxytocin, the primary hormone driving uterine contractions **[12]**. This inhibition can lead to dysfunctional labor patterns (dystocia), a leading indication for primary cesarean sections **[13]**.

Nurses providing CLS act as a physiological buffer. By providing emotional reassurance ("Mothering the

Mother"), physical comfort, and advocacy, they reduce maternal anxiety, lower catecholamine levels, and facilitate the unobstructed flow of endogenous oxytocin **[14]**. This "psycho-analgesic" effect not only reduces pain perception but actively promotes the mechanical progress of labor **[13]**.

3.2 Evidence from Clinical Trials

The empirical evidence supporting CLS is robust. A foundational Cochrane review encompassing 24 trials and over 15,000 women found that women receiving continuous support were significantly less likely to experience a cesarean birth (Average Risk Ratio 0.75; 95% CI 0.64 to 0.88). While the effect size was greatest when the provider was not a hospital employee (e.g., a doula), nurse-led models also demonstrated efficacy when the support was truly continuous rather than intermittent **[15]**.

A specific randomized controlled trial (RCT) conducted in Sweden (2015–2017) examined the impact of continuous support by a midwife/nurse versus standard care (intermittent monitoring) **[12]**. The results were striking:

- **Emergency Cesarean Rate:** 3% in the continuous support group vs. 14% in the standard care group.
- **Labor Duration:** Significantly shorter active labor in the support group.
- **Physiological Markers:** Women in the support group exhibited lower cortisol levels, corroborating the stress-reduction mechanism.

However, the efficacy of CLS is contingent on the environment. A systematic review noted that in hospitals with high baseline rates of routine medical intervention (e.g., routine continuous electronic fetal monitoring, restrictions on movement), the protective effect of nursing support was diminished **[16]**. This suggests that nursing support cannot fully compensate for a highly medicalized system but works best synergistically with a physiological approach to care.

3.3 One-to-One Nursing Models

Operationalizing CLS typically requires a one-to-one nurse-to-patient ratio. Evidence from care bundle studies indicates that models incorporating one-to-one support are associated with:

- **Reduced Overall CS:** Odds Ratio (OR) 0.83 (95% CI 0.72 to 0.97).
- **Reduced Emergency CS:** Odds Ratio (OR) 0.82 (95% CI 0.68 to 0.98).
- **No Increase in Adverse Outcomes:** No significant difference in neonatal intensive care admissions **[17]**.

In the United States, a quality improvement project implementing one-to-one support as part of a bundle reduced the Nulliparous Term Singleton Vertex (NTSV) cesarean rate from 29.3% to 25.3% over two years. This 4% absolute reduction represents a significant decrease in major abdominal surgeries and their sequelae **[18]**.

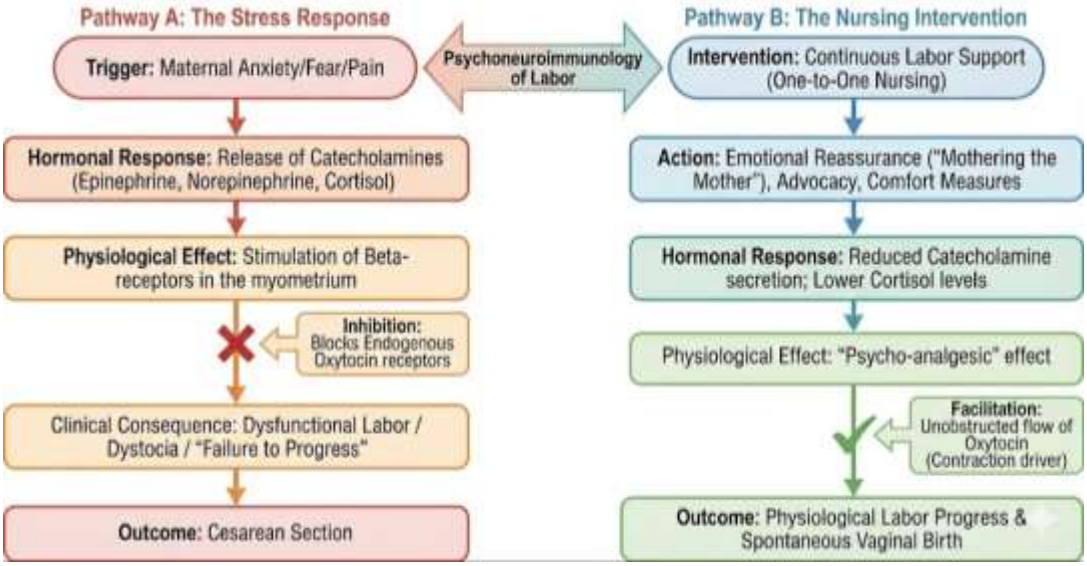


Figure 1: The Physiological Pathway of Nursing Support

4. Biomechanical and Physiological Interventions

Beyond emotional presence, nurses employ advanced biomechanical techniques to facilitate fetal rotation and descent, directly addressing "failure to progress" or labor dystocia.

4.1 The Peanut Ball Intervention

The peanut ball—an oblong, peanut-shaped exercise ball placed between the legs of a laboring woman—has emerged as a transformative tool, particularly for women utilizing epidural analgesia. Epidurals often mandate bed rest, leading to supine or semi-recumbent positioning that can narrow the pelvic outlet and inhibit fetal rotation **[19]**.

A 2025 systematic review and meta-analysis of eight studies (N=1,352) provided compelling quantitative evidence for its utility:

- **Cesarean Reduction:** The use of the peanut ball significantly reduced the risk of cesarean section (RR 0.74; 95% CI: 0.60–0.91, p=0.0004) **[20]**.
- **Labor Duration:** For women with epidurals, the first stage of labor was shortened by approximately 53 minutes (Mean Difference -52.98 min) **[20]**.

Mechanism: The peanut ball mechanically opens the pelvic outlet (specifically the mid-pelvis and outlet dimensions depending on placement) even when the woman is in a lateral recumbent position. This mimics the biomechanical advantages of squatting or lunging, facilitating the cardinal movements of labor (internal rotation and descent) **[21]**. Nursing protocols that mandate the offer of a peanut ball to every woman with an epidural represent a high-value, low-cost intervention.

4.2 Maternal Positioning and Mobility

Traditional obstetric models often confine women to bed, yet physiological evidence strongly favors upright positions and mobility. Gravity assists fetal descent, and changing pelvic angles helps the fetus navigate the birth canal **[22]**. A review of maternal positioning indicated that upright positions in the first stage of labor (e.g., walking, standing, sitting on a birth ball) are associated with shorter labors (~1 hour reduction) and a lower likelihood of cesarean delivery compared to recumbent positions **[23]**.

Regarding Nursing Role, nurses are the primary agents of mobility. Educational interventions that train nurses in specific "flexible sacrum" positions and biomechanics increase their self-efficacy in managing dystocia. A quality improvement project showed that increasing nurse confidence in these maneuvers was correlated with improved vaginal birth rates **[24]**.
There is also Spinning Babies®, this specific protocol, focusing on pelvic balance and myofascial release, has gained traction. A clinical trial reported a reduction in CS rates from 27% to 14% after nurses were trained in Spinning Babies techniques, validating the concept that skilled manual interventions by nurses can resolve malpositions that would otherwise lead to surgery **[25]**.

4.3 Hydrotherapy

Water immersion (hydrotherapy) during the first stage of labor serves as a non-pharmacological analgesic. By reducing pain and promoting relaxation through buoyancy and warmth, hydrotherapy can delay or eliminate the need for epidural analgesia.

- **Epidural Sparing:** Studies indicate a significant reduction in epidural use among women utilizing hydrotherapy (20.2% vs. 40.7% in controls) **[26]**. Since early epidural use is associated with longer second stages and instrumental delivery in some cohorts, this delay is clinically beneficial.
- **Cesarean Impact:** While some individual studies show mixed results regarding direct CS reduction, systematic reviews suggest a trend toward lower operative delivery rates due to the reduction in the "cascade of interventions" (e.g., less oxytocin augmentation required) **[27]**.
- **Safety:** Hydrotherapy was found to be safe, with no adverse impact on Apgar scores or neonatal infection rates **[28]**.

5. Educational and Psychosocial Interventions

Nursing care extends into the antenatal period, where education can shape maternal expectations, reduce fear, and empower decision-making.

5.1 Nurse-Led Antenatal Education and Relaxation Training

Tocophobia (severe fear of childbirth) is a significant driver of elective cesarean sections (Maternal Request Cesarean). Nurse-led interventions targeting this fear have proven highly effective.

- **Relaxation Training:** A randomized trial in Iran demonstrated that a nurse-led applied relaxation training program reduced the cesarean rate to a relative risk of 0.22 (95% CI 0.11 to 0.43) compared to routine care **[29]**. This massive effect size underscores the role of psychological state in labor physiology.
- **Psychoeducation:** Programs combining childbirth education with psychosocial support for couples (RR 0.53) and psychoeducation specifically for fear (RR 1.33 for spontaneous vaginal birth) have been validated **[29]**. These interventions equip women with coping mechanisms for pain, reducing the perceived need for surgical "rescue."
- **Self-Efficacy:** Theory-based nursing programs that enhance maternal self-efficacy are linked to higher rates of exclusive breastfeeding and lower rates of perceived traumatic birth, indirectly supporting vaginal birth culture **[30]**.

5.2 Triage and Admission Management

The timing of hospital admission is a critical "gatekeeping" function often managed by nurses. Admitting women in the latent phase of labor (typically <4–6 cm dilation) is strongly associated with higher intervention rates.

- **The Cascade:** Latent phase admission increases the use of epidurals, oxytocin, and continuous monitoring. This medicalization often leads to a diagnosis of "failure to progress" based on active labor standards applied to a woman who was not yet in active labor **[7]**.

- **Intervention:** Nurse-led triage protocols that assess women and encourage those in latent labor to return home (with reassurance and instructions) have been shown to reduce epidural use and labor augmentation. A randomized trial confirmed that early labor assessment by nurses resulted in significant decreases in these antecedent interventions, preserving the physiology of labor for when the woman is eventually admitted in active labor **[31]**.
- **Standardization:** Implementing standardized definitions of active labor (e.g., 6 cm dilation) as part of admission criteria is a key component of safety bundles designed to reduce NTSV cesareans **[32]**.

6. Organizational and Systems-Level Interventions

Nursing interventions are ecologically situated; their success depends heavily on the organizational architecture of the birth unit.

6.1 Nurse Staffing Ratios: The Critical Variable

Adequate nurse staffing is arguably the single most important structural determinant of safe birth. A landmark 2025 study analyzing data from 193 U.S. hospitals and 2,786 nurses established a direct link between staffing and outcomes.

- **Outcomes:** Hospitals that adhered to the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) guidelines (recommending 1:1 ratios for women in active labor or receiving oxytocin) had an **11% lower cesarean rate** compared to those with poor adherence **[33]**.
- **Predictive Value:** Nurse staffing was an independent predictor of hospital-level cesarean and VBAC (Vaginal Birth After Cesarean) rates, even after controlling for hospital characteristics **[34]**.
- **Mechanism:** When nurses care for only one patient, they have the time to perform labor-intensive interventions like peanut ball positioning, hydrotherapy support, and continuous emotional coaching. Understaffing forces a reliance on technology (remote fetal monitoring) and efficiency-driven protocols (oxytocin to speed labor), which unintentionally drive up CS rates **[33]**.

6.2 Unit Culture and Interdisciplinary Collaboration

The "micro-culture" of a unit—the shared beliefs about birth—dictates practice.

- **Labor Culture Survey:** Research indicates that in hospitals successful at reducing NTSV rates, nurses are significantly more likely to agree that "the culture of this unit supports vaginal birth" **[35]**.
- **Collaboration:** High-functioning teams where nurses feel empowered to speak up and advocate for physiological birth (e.g., challenging an early amniotomy decision) have lower CS rates. Hierarchical environments where nurses are passive subordinates to physician preferences are associated with higher intervention rates **[36]**.
- **Safety Bundles:** The implementation of "bundles" (standardized sets of evidence-based practices) promotes a cohesive culture. Bundles that include nurse-led checklists for dystocia, standardized oxytocin protocols, and huddles have been shown to reduce overall CS (OR 0.83) **[17]**.

6.3 Audit and Feedback

Data transparency drives change. Nurse-led audit cycles, particularly those using the Robson Ten Group Classification System, allow units to pinpoint exactly which groups of women are having unnecessary cesareans (e.g., Group 1: Nulliparous, single cephalic, >37 weeks, spontaneous labor).

- **Impact:** Providing clinicians (nurses and doctors) with their own data compared to peers creates accountability. Studies show that audit and feedback interventions can stabilize or reduce rising CS rates **[37]**.
- **Implementation:** Nurses play a key role in data collection and the review of "near miss" cesareans to identify preventable factors **[38]**.

7. Midwifery-Led Models and Collaborative Care

While nursing and midwifery are distinct professions in many jurisdictions, their roles overlap significantly in intrapartum care, and collaborative models are highly effective.

7.1 Midwifery-Led Continuity of Care

Global evidence consistently demonstrates that midwifery-led continuity of care (where a midwife is the primary provider throughout pregnancy and birth) is the "gold standard" for reducing unnecessary interventions.

- **Cochrane Evidence:** A review of 15 studies found that women in midwifery-led models were significantly less likely to experience cesarean birth (Average RR 0.75) or instrumental delivery **[39]**.
- **Comparison:** A study comparing midwife-led vs. obstetrician-led care found that women receiving midwife-led care had 25% lower rates of unplanned cesarean deliveries **[40]**.

7.2 Collaborative Practice

In settings where midwives are integrated into hospital teams (common in Europe and Australia, increasing in the US), nurses often work in tandem with midwives.

- **Synergy:** Midwives provide the philosophy of physiological management, while nurses provide the continuous bedside support and monitoring. This collaboration enhances the effectiveness of interventions like positioning and triage **[41]**.
- **Outcomes:** Hospital-based midwifery practices with strong nursing collaboration have demonstrated NTSV cesarean rates significantly lower than national averages (e.g., <6% for low-risk women in an Irish study) **[42]**.

8. Global Context: Disparities and Implementation

The application of these interventions varies radically based on the economic and structural context of the health system.

8.1 High-Income Countries (HICs): De-Medicalization

In HICs (USA, Australia, Western Europe), the primary driver of unnecessary CS is the "too much, too soon" phenomenon—over-intervention in healthy pregnancies due to risk aversion and technological reliance.

- **Focus:** Nursing interventions here focus on de-medicalization: delaying admission, maximizing mobility (peanut balls), and reducing pharmacological pain relief (hydrotherapy) **[7]**.
- **Successes:** The US "AIM" bundles and California's CMQCC toolkits have successfully used nurse-led protocols to lower NTSV rates **[43]**.

8.2 Low- and Middle-Income Countries (LMICs): The Double Burden

LMICs (e.g., Brazil, China, India, parts of Africa) face a dual challenge: excessive CS rates in private/urban sectors ("too much, too soon") alongside a lack of access in rural areas ("too little, too late").

- **Brazil:** The "Adequate Childbirth Project" (PPA) illustrates a successful system-wide intervention. By implementing nurse-led bundles, multidisciplinary teams, and creating distinct roles for nurse-midwives, participating private hospitals increased vaginal birth rates from 23.6% to 30.1% **[7]**.
- **China:** With some of the highest CS rates globally, interventions have focused on nurse-led education and doula training. While cultural factors and the legacy of the one-child policy drive demand, multifaceted nursing interventions have shown promise in stabilizing rates, though reductions are harder to achieve than in other settings **[44]**.
- **Sub-Saharan Africa:** Here, the nursing role is often one of survival and triage. Staffing shortages are acute. While the goal is to reduce unnecessary CS in referral hospitals (where rates can be high due to

defensive practice), the lack of resources often prevents the implementation of 1:1 support. However, nurse-led triage and referral improvements (e.g., in Rwanda) help ensure that CS is reserved for those who truly need it **[45]**.

Table 2: Comparative Effectiveness of Interventions by Region

Intervention	**HIC Effectiveness (e.g., USA, Sweden)**	**LMIC Effectiveness (e.g., Brazil, Iran)**	**Key Contextual Factor**
Continuous Support	High (RR 0.75). Standard of care in many midwifery units.	Moderate to High. Often limited by severe staffing shortages.	Staffing Ratios
Peanut Ball / Positioning	High. Effective antidote to epidural immobility.	Variable. Less relevant where epidurals are scarce; high relevance in private sectors.	Epidural Prevalence
Antenatal Education	Moderate. Competes with "convenience" culture.	High (RR 0.22 in Iran). Effectively targets high fear/tocophobia.	Cultural Fear/Knowledge
Audit & Feedback	High. Drivers are often data-driven quality metrics.	High. Drivers include cost containment and WHO targets.	Data Infrastructure

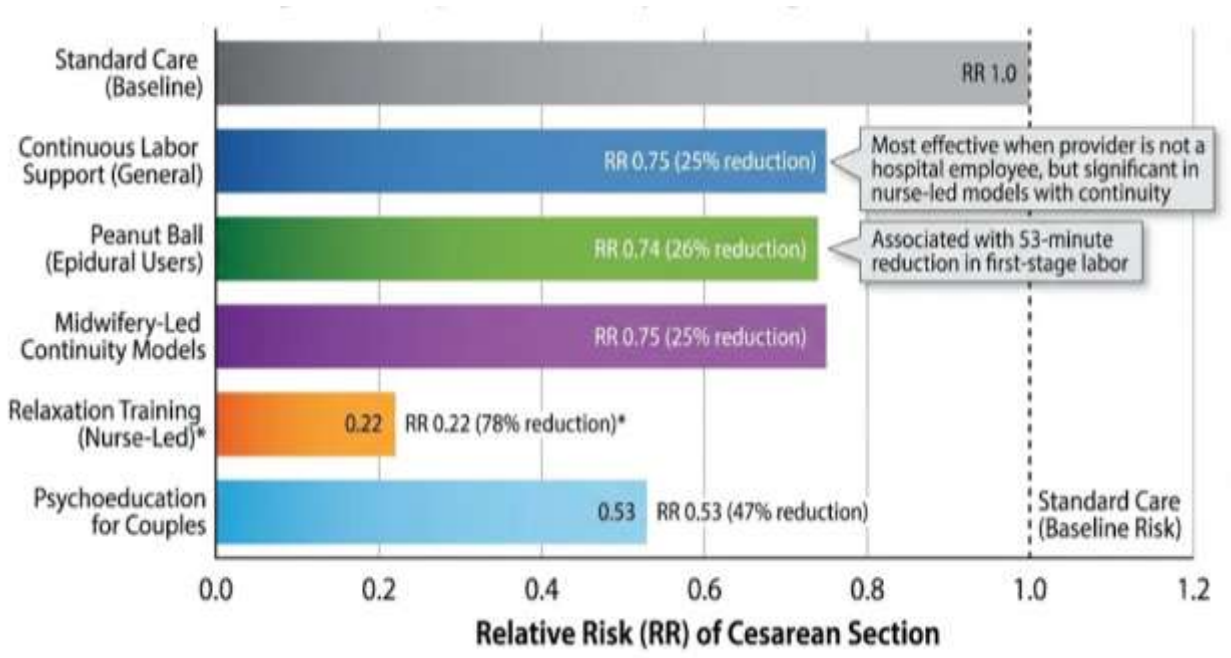


Figure 2: Comparative Efficacy of Nursing Interventions

9. Barriers and Facilitators

9.1 Barriers to Implementation

1. **Medical Hierarchy:** In many global settings, nurses operate in rigid hierarchies where questioning a physician's decision to cut is professionally risky. This "ethical decline" prevents advocacy **[46]**.
2. **Staffing Constraints:** As shown in the 2025 US study, understaffing is a primary driver of CS. In LMICs, nurse-to-patient ratios can be 1:10 or worse, making CLS impossible **[33]**.
3. **Financial Incentives:** In private sectors (e.g., Brazil, India), CS is often more lucrative and time-efficient for providers. Nursing interventions that prolong labor (even physiologically) conflict with the business model of the hospital **[47]**.
4. **Skills Gap:** A generation of nurses has been trained in high-intervention settings, leading to a loss of skills in physiological birth support (e.g., manual rotation, breech support) **[48]**.

9.2 Facilitators of Success

1. **Policy Support:** National guidelines (like Brazil's PPA or US Joint Commission standards on NTSV rates) provide the political "cover" for nurses to implement change **[7]**.
2. **Education:** Training programs like "Mothering the Mother" and simulation drills empower nurses with the vocabulary and skills to advocate effectively **[13]**.
3. **Data Visibility:** Transparent reporting of unit and provider data creates a competitive drive for quality improvement **[38]**.

10. Conclusion and Recommendations

10.1 Conclusion

This systematic review confirms that nursing interventions are a powerful, evidence-based mechanism for reducing unnecessary cesarean sections. The data indicates a dose-response relationship: the more continuous, skilled, and physiologically oriented the nursing care, the lower the probability of surgical birth. Specifically, continuous labor support, biomechanical positioning (peanut balls), nurse-led education, and adequate staffing ratios (1:1) are proven strategies with significant effect sizes.

However, these interventions are not "plug and play." Their success depends on a supportive ecosystem that includes collaborative unit culture, data transparency, and the removal of perverse financial incentives.

10.2 Recommendations

For Clinical Practice:

- **Implement Peanut Balls:** Make peanut balls standard equipment in every labor room, with mandatory training for nurses on their use for epiduralized patients.
- **Standardize Admission:** Adopt strict nurse-led triage protocols to prevent admission before active labor (4–6 cm) unless medically indicated.
- **Promote Mobility:** Incorporate "mobility goals" into the nursing care plan (e.g., position change every 30 minutes).

For Policy and Management:

- **Mandate Staffing Ratios:** Healthcare systems must legislate or mandate 1:1 nurse-to-patient ratios for active labor to enable the provision of continuous support. The long-term cost savings from reduced surgical morbidity justify the investment.
- **Invest in Midwifery:** Expand the role of midwives and integrate them into hospital teams to lead physiological care pathways.
- **Data Accountability:** Implement Robson Group auditing and provide nurses with feedback on the birth outcomes of the patients they support.

For Future Research:

- **Implementation Science:** Focus on how to implement these interventions in resource-constrained LMIC settings where 1:1 staffing is currently unfeasible.
- **Cost-Effectiveness:** rigorous economic analyses comparing the cost of increased nursing staffing vs. the cost of lifetime morbidity associated with unnecessary cesareans.

By centering the nurse as the guardian of physiological birth, healthcare systems can reverse the global trend of unnecessary surgery, ensuring safer, respectful, and more satisfying birth experiences for women worldwide.

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