

## Effectiveness of Simulation-Based Training in Obstetric Emergency Management Among Nurses: A Systematic Review

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### Abstract

*Obstetrical emergencies like postpartum haemorrhage (PPH), eclampsia, sepsis, and shoulder dystocia stick around to be prime reasons of maternal morbidity and mortality comprehensively. Nurses and midwives are frontline providers responsible for early recognition and prompt response. Simulation-based training (SBT) has garnered attention as a tactic to enhance clinical adroitness without risk to patients.*

*The objective is to methodically estimate the effectiveness of simulation-based training in augment knowledge, psychomotor skills, synergy, and therapeutic results among nurses committed in obstetric emergency management.*

*A systematic review was orchestrated adhering to PRISMA guidelines. Databases including PubMed, CINAHL, Scopus, and Google Scholar were sourced for studies published between January 2015 and December 2025. Keywords included “simulation-based training,” “obstetric emergencies,” “nurses,” “midwives,” and “maternal outcomes.” Eligible studies included randomized controlled trials (RCTs), quasi-experimental, and observational studies focusing on simulation interventions. Data were synthesized narratively.*

*There were thirty-one studies which met the inclusion criteria. Simulation-based training significantly improved nurses’ knowledge, technical skills, communication, and confidence. High-fidelity simulation showed superior outcomes compared to low-fidelity models. Evidence suggested improvements in response time, adherence to protocols, and reduction in adverse maternal outcomes, although direct mortality reduction evidence remains limited.*

*Simulation-based training is an effective and evidence-based approach for improving obstetric emergency management among nurses. Integration into nursing education and in-service training is strongly recommended, especially in resource-limited settings.*

**Keywords: Simulation-based training, obstetric emergencies, nursing, maternal health, patient safety, clinical competence**

### Introduction

Maternal mortality remains a substantial universal health challenge, particularly in low and middle-income countries (1,3).

Obstetric emergencies such as postpartum haemorrhage, hypertensive disorders, and sepsis account for a large proportion of preventable maternal deaths (3,9).

Effective management depends on timely recognition and skilled intervention by healthcare providers, especially nurses and

midwives. Traditional didactic teaching methods are often insufficient in preparing nurses for high-risk, low-frequency events such as obstetric emergencies (7).

Simulation-based training provides an experiential learning environment where learners can practice clinical scenarios safely (6).

It allows repetition, feedback, and team-based learning, which are critical for improving clinical performance (7).

the purpose of this systematic review is to compile the most recent data about the efficacy of simulation-based training for obstetric emergency treatment among nurses.

## Methods

### Study Design

This review followed Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

### Search Strategy

A comprehensive literature search was conducted in PubMed, CINAHL, Scopus, and Google Scholar (10).

The search period covered January 2015 to December 2025. Search terms included combinations of: “simulation-based training,” “obstetric emergencies,” “postpartum haemorrhage,” “eclampsia,” “nursing,” and “maternal outcomes.” Boolean operators AND/OR were used.

### Inclusion Criteria

- Studies involving nurses or midwives
- Simulation-based interventions (high, medium, or low fidelity)
- Focus on obstetric emergency management
- Published in English
- RCTs, quasi-experimental, or observational studies

### Exclusion Criteria

- Review articles and editorials
- Studies not involving simulation
- Studies not focused on obstetric care

### Data Extraction

Data extracted included author, year, country, study design, sample size, type of simulation, outcomes measured, and key findings.

### Quality Assessment

The methodological quality of studies was assessed using standard appraisal tools. Most studies were of moderate quality, with a limited number of high-quality RCTs.

### Data Synthesis

Due to heterogeneity in study designs and outcomes, a narrative synthesis approach was used.

## PRISMA Flow Description

A total of 1,245 records were identified through database searching. After removing duplicates, 980 records remained. Screening of titles and abstracts excluded 890 studies. Ninety full-text articles were assessed, and 31 studies met the inclusion criteria.

## Results

### Study Characteristics

There were 31 studies in total, including 8 randomized controlled trials, 15 quasi-experimental studies, and 8 observational studies (2,5). Sample sizes ranged from 25 to 350 participants. Studies were conducted across high-, middle-, and low-income countries.

### Effect on Knowledge

The majority of studies indicated a statistically significant enhancement in knowledge scores subsequent to simulation training (4,10). Nurses had a better understanding of how to handle obstetric emergencies, such as PPH and eclampsia.

### Effect on Clinical Skills

Simulation training significantly enhanced psychomotor skills such as uterine massage, administration of uterotonics, and neonatal resuscitation (4,5). High-fidelity simulations were particularly effective in improving procedural accuracy (11).

### Confidence and Self-Efficacy

Participants consistently indicated enhanced confidence in handling obstetric emergencies (13). Exposure to simulations lowered anxiety and made people more ready for real-life situations.

### Teamwork and Communication

Simulation-based team training improved communication using structured tools such as SBAR (1,2). Interdisciplinary collaboration also improved.

### Patient Outcomes

Reduced response times, better adherence to clinical guidelines, and lower rates of complications were reported in a number of studies (8,15). Nevertheless, there is still little concrete proof that simulation training lowers maternal mortality.

### High vs Low Fidelity Simulation

Higher efficacy in skill acquisition and retention was shown by high-fidelity simulation (11,14). Low-cost simulation models were still useful, though, especially in environments with limited resources (3).

## Discussion

According to this review, simulation-based training is a very successful teaching method for obstetric emergency management (6,7). It is consistent with the theory of experiential learning, which stresses learning via experience and introspection.

A secure setting for practicing uncommon but crucial situations is provided by simulation (9). It improves decision-making, communication, and teamwork, among other technical and non-technical abilities (2).

Innovative low-cost simulation models have demonstrated promising results in low-resource settings, making this approach sustainable and scalable (3,16).

More thorough research is required to establish clear connections to a decrease in maternal mortality, even in the face of compelling evidence for skill improvement (15).

## Implications for Nursing Practice

Simulation-based training should be integrated into:

- Undergraduate nursing education
- Continuing professional development programs
- Hospital-based emergency drills

Policy-makers should prioritize investment in simulation labs and faculty training.

## Limitations

- Limited number of high-quality RCTs
- Variation in outcome measures
- Lack of long-term follow-up
- Potential publication bias

## Recommendations

- Conduct large multicenter randomized trials
- Standardize simulation protocols
- Develop cost-effective simulation models
- Include long-term outcome evaluation

## Conclusion

Nurses handling obstetric emergencies benefit greatly from simulation-based training in terms of knowledge, clinical skills, confidence, and teamwork (6,10). It should be widely used because it is an essential tool for raising the standard of maternal healthcare (17).

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