

Simulation-Based Education in Nursing: A Narrative Review

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Abstract: *Simulation-based education (SBE) is an innovative and effective teaching-learning strategy widely used in nursing education to improve students' clinical competency, critical thinking, communication skills, confidence, and patient safety. It provides realistic clinical experiences through the use of mannequins, standardized patients, role play, and virtual simulation in a safe and controlled learning environment. Simulation helps nursing students bridge the gap between theoretical knowledge and clinical practice by allowing repeated practice without causing harm to real patients. This narrative review explores the meaning, history, purposes, and components of simulation-based education in nursing supported by previous research studies. Literature findings indicate that simulation significantly enhances psychomotor skills, clinical judgment, decision-making abilities, teamwork, and knowledge retention among nursing students. Studies by Al Gharibi and Arulappan (2020), Guerrero et al. (2022), and Tong et al. (2024) demonstrated that simulation-based learning improves self-confidence, satisfaction, critical thinking, and overall clinical performance more effectively than traditional teaching methods. The review also highlights the major components of simulation-based education, including simulation scenarios, learning objectives, simulators, facilitators, prebriefing, simulation activity, debriefing, evaluation, and feedback. Evidence from multiple studies suggests that these components contribute to effective experiential learning and reflective practice. In conclusion, simulation-based education plays a vital role in modern nursing education by preparing competent, confident, and safe nursing professionals. Despite certain challenges such as high cost and the need for trained faculty, simulation remains an essential educational strategy for improving nursing practice and patient care outcomes.*

Keywords: Simulation-based education, nursing education, clinical competency, high-fidelity simulation, critical thinking, patient safety, nursing students

1. Introduction

Simulation-based education (SBE) is an innovative teaching-learning strategy widely used in nursing education to improve students' clinical competency, critical thinking, confidence, communication, and patient safety. It provides realistic clinical scenarios using mannequins, standardized patients, or virtual platforms in a safe learning environment. Simulation allows nursing students to practice procedures repeatedly without causing harm to real patients and helps bridge the gap between theoretical knowledge and clinical practice.

Several studies support the effectiveness of simulation-based education in nursing. Al Gharibi and Arulappan (2020) reported that repeated simulation experiences significantly improved nursing students' self-confidence, competency, and critical thinking abilities. Similarly, Guerrero et al. (2022) found that high-fidelity simulation enhanced students' satisfaction, confidence, and clinical decision-making skills. Tong et al. (2024) also demonstrated that simulation-based education improved undergraduate nursing students' clinical competence, teamwork, and learning interest more effectively than traditional teaching methods. Therefore, simulation-based education has become an essential component of modern nursing education for preparing competent and safe nursing professionals. There are various simulation labs, out of which one simulation lab is in SGT University, Haryana, where the Indian Nursing Council under the Ministry of Health and Family Welfare (MoHFW) provides financial support to two nursing faculty members from each college, in a phased manner, to train them as master trainers for simulation-based training.

2. Meaning of Simulation

Simulation is a teaching and learning method that imitates real-life clinical situations in a controlled and safe environment to help students develop knowledge, skills, communication, critical thinking, and clinical decision-making abilities. In nursing education, simulation may involve the use of mannequins, standardized patients, role play, task trainers, or virtual technology to provide hands-on learning experiences without risking patient safety.

According to the International Nursing Association for Clinical Simulation and Learning, simulation is a technique that creates a guided interactive experience to replace or amplify real experiences through realistic clinical practice.

Jeffries (2005) defined simulation as an educational strategy that replicates aspects of the clinical environment to promote safe and effective learning among nursing students.

3. History of Simulation

The use of simulation in healthcare education began many years ago and has evolved significantly over time. In healthcare and nursing education, David M. Gaba is widely regarded as the pioneer or "father of modern medical simulation" because he developed and promoted simulation-based training in healthcare education.

- In ancient times, simple models were used to teach basic medical procedures.
- During the 18th century, anatomical models and obstetric mannequins were introduced for training midwives and medical students.

Volume 15 Issue 7, July 2026

Fully Refereed | Open Access | Double Blind Peer Reviewed Journal

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- One of the earliest obstetric simulators, known as “The Phantom,” was developed in Europe to teach childbirth procedures.
- In the 1960s, modern medical simulation advanced with the development of “Resusci Anne,” a mannequin designed for cardiopulmonary resuscitation (CPR) training by the Laerdal Medical.
- During the late 20th century, computerized and high-fidelity simulators were introduced, allowing realistic monitoring of vital signs, breathing, heart sounds, and emergency responses.
- In the 21st century, simulation-based education became widely integrated into nursing and medical curricula worldwide because of its effectiveness in improving clinical competence, patient safety, teamwork, and communication skills.

4. Purpose of Simulation-Based Education in Nursing:

Simulation-based education (SBE) is used in nursing education to provide realistic clinical experiences in a safe and controlled environment. The main purpose of simulation is to improve nursing students’ clinical competency, critical thinking, communication, confidence, decision-making, and patient safety before they enter real clinical settings.

- 1) **To Improve Clinical Skills and Competency:** Simulation helps nursing students practice procedures repeatedly and develop psychomotor skills safely. A meta-analysis by Sun Kyung Shin and colleagues found that simulation-based nursing education had significant positive effects on students’ cognitive, affective, and psychomotor learning outcomes, especially with high-fidelity simulation.
- 2) **To Bridge the Gap Between Theory and Practice:** Simulation enables students to apply theoretical knowledge in realistic patient-care situations. A systematic review by Robyn P. Cant and Simon J. Cooper reported that simulation-based learning effectively bridges classroom theory with clinical practice and improves students’ preparedness for patient care.
- 3) **To Enhance Critical Thinking and Decision-Making:** Simulation develops students’ ability to assess patient conditions, identify problems, and make appropriate nursing decisions during emergencies. According to a recent systematic review published in *Nurse Education in Practice* (2026), high-fidelity and virtual simulations improved clinical reasoning, decision-making, and nursing performance more effectively than traditional lecture-based teaching methods.
- 4) **To Improve Confidence and Reduce Anxiety:** Repeated simulation practice increases students’ confidence before actual clinical exposure. A systematic review by Chitra Tamilselvan and colleagues found that undergraduate nursing students experienced increased confidence, knowledge, and preparedness after participating in simulation-based learning activities.
- 5) **To Promote Patient Safety:** Simulation allows students to learn from mistakes without harming real patients, thereby promoting safe nursing care. Feroz Lateef stated that simulation-based learning improves patient safety by allowing learners to practice clinical skills,

communication, and emergency management in a risk-free environment.

- 6) **To Improve Knowledge Retention and Communication Skills:** Simulation promotes active participation, teamwork, and communication among nursing students. A systematic review by Ali Alharbi and colleagues concluded that simulation-based learning significantly improves students’ knowledge retention, communication, and practical nursing skills.

5. Components of Simulation-Based Education in Nursing

Simulation-based education (SBE) consists of several essential components that help create a realistic and effective learning experience for nursing students. These components work together to improve clinical competency, communication, critical thinking, and patient safety.

- 1) **Simulation Scenario:** A simulation scenario is a planned clinical situation designed according to learning objectives. It may include patient history, symptoms, nursing problems, and expected nursing interventions. Pamela R. Jeffries stated that well-designed simulation scenarios help students integrate theoretical knowledge with clinical practice and improve decision-making skills.
- 2) **Learning Objectives:** Learning objectives describe what students are expected to achieve after participating in simulation. Objectives may focus on knowledge, psychomotor skills, communication, teamwork, or critical thinking. A study by Cant and Cooper (2010) reported that clear learning objectives improve students’ engagement and learning outcomes during simulation-based education.
- 3) **Simulator or Mannequin:** Simulators are devices used to imitate real patients. They may range from simple task trainers to high-fidelity computerized mannequins capable of showing breathing, pulse, heart sounds, and vital signs. Types of simulator low-fidelity simulator, medium-fidelity simulator, high-fidelity simulator Shin et al. (2016) found that high-fidelity simulation significantly improves students’ clinical competency, confidence, and psychomotor skills.
- 4) **Facilitator or Instructor:** The facilitator guides students throughout the simulation process, provides instructions, observes performance, and conducts feedback sessions. According to INACSL guidelines, trained facilitators play an important role in improving students’ learning experiences and reflective thinking during simulation.
- 5) **Prebriefing:** Prebriefing is the orientation phase before simulation where students receive information about objectives, equipment, environment, and expectations. Its importance includes reduces anxiety, improves confidence, prepares students for active participation. Studies show that prebriefing enhances psychological safety and student readiness for simulation learning.
- 6) **Simulation Activity:** This is the actual enactment of the clinical scenario where students assess patients, perform procedures, communicate, and make decisions. Guerrero et al. (2022) reported that active participation in simulation improves critical thinking and clinical judgment skills among nursing students.
- 7) **Debriefing:** Debriefing is the discussion and reflection session conducted after simulation. Students review their performance, identify strengths and weaknesses, and

receive feedback. It enhances reflective learning, improves critical thinking, strengthens future clinical performance. Fanning and Gaba (2007) identified debriefing as the most important component of simulation-based learning because it promotes reflection and deeper understanding.

- 8) **Evaluation and Feedback:** Evaluation measures students' performance and achievement of learning objectives. Feedback helps students improve knowledge and clinical skills. Research indicates that constructive feedback after simulation improves learning retention and competency development.

6. Conclusion

Simulation-based education is particularly important in nursing because it promotes safe patient care, reduces clinical errors, and prepares future nurses to manage complex healthcare situations effectively. It also supports competency-based nursing education and helps students adapt to rapidly changing healthcare environments. Therefore, simulation should be integrated into nursing curricula at all levels of nursing education. Nursing institutions should establish well-equipped simulation laboratories and provide training programs for faculty members to ensure effective implementation of simulation-based teaching. Future research should focus on long-term outcomes of simulation learning, cost-effectiveness, and the use of advanced technologies such as virtual reality and artificial intelligence in nursing education. In conclusion, simulation-based education is a valuable educational approach that strengthens nursing education, improves clinical practice, and ultimately contributes to better patient outcomes and quality healthcare services.

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