

# Enhancing Clinical Competency Through Simulation-Based Nursing Education: A Literature Review

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## ABSTRACT

Simulation-based nursing education has gained increasing recognition as a strategy to enhance clinical competency amid growing concerns about limited clinical exposure and patient safety in traditional training models. This literature review synthesizes empirical and meta-analytic evidence examining the effectiveness of simulation-based education in strengthening psychomotor skills, clinical judgment, critical thinking, and interprofessional collaboration among nursing students. Relevant studies were identified through database searches of peer-reviewed journals focusing on randomized controlled trials, quasi-experimental studies, systematic reviews, and meta-analyses evaluating simulation interventions in nursing education.

Findings consistently indicate that simulation-based education significantly improves clinical performance outcomes compared with conventional lecture-based instruction. High-fidelity simulation environments, structured debriefing methods, and adherence to established standards such as the INACSL Best Practice Guidelines contribute to measurable gains in competency. Evidence from large-scale studies further supports the substitution of a portion of clinical hours with simulation without compromising licensure performance or readiness for practice. Improvements were observed not only in psychomotor performance but also in clinical reasoning, self-confidence, and teamwork skills essential for patient safety.

Despite these advantages, implementation challenges persist, including financial constraints, variability in faculty training, and lack of standardized assessment frameworks. Emerging digital platforms and virtual simulation technologies present promising alternatives for expanding access while maintaining educational effectiveness. Overall, simulation-based nursing education represents a theory-informed and evidence-supported approach that enhances multidimensional clinical competency. Strategic curricular integration, institutional investment, and faculty development are necessary to sustain its impact and ensure the preparation of safe, competent, and practice-ready nursing professionals.

*Keywords: simulation-based nursing education; clinical competency; high-fidelity simulation; clinical judgment; nursing education; patient safety; interprofessional collaboration; virtual simulation.*

## 1. INTRODUCTION

Nursing education plays a foundational role in preparing a competent healthcare workforce capable of responding to increasingly complex patient needs. The global healthcare environment has evolved significantly due to technological advancements, demographic shifts, and the growing burden of chronic and acute conditions. As a result, nurses are expected to demonstrate high levels of clinical competence, critical thinking, rapid decision-making, and effective communication in high-risk environments. Clinical competency, defined as the integration of knowledge, psychomotor skills, clinical judgment, and professional attitudes in patient care, is central to safe and effective nursing practice. However, persistent concerns remain regarding the adequacy of traditional clinical education models in preparing students for real-world healthcare demands.

Historically, nursing education has relied heavily on clinical placements within hospital settings to facilitate experiential learning. While clinical exposure remains essential, several structural and systemic challenges have limited its effectiveness. Increasing student enrollment, reduced availability of clinical sites, patient safety regulations, and heightened supervision requirements have constrained opportunities for direct hands-on practice. Furthermore, the unpredictability of clinical cases restricts students' exposure to high-risk, low-frequency events such as cardiac arrest, medication errors, and emergency interventions. These limitations have raised concerns about the preparedness of new graduates and their transition into professional practice.

In response to these challenges, simulation-based nursing education has emerged as a transformative pedagogical strategy. Simulation involves the use of high-fidelity mannequins, standardized patients, virtual environments, and scenario-based exercises designed to replicate real clinical situations in a controlled and safe learning environment. The National Council of State Boards of Nursing (NCSBN) landmark simulation study demonstrated that up to 50% of traditional clinical hours could be effectively replaced by high-quality simulation without compromising educational outcomes (Hayden et al., 2014). This finding significantly influenced curriculum reforms worldwide and positioned simulation as a credible alternative and supplement to clinical placements.

Beyond serving as a substitute for clinical hours, simulation-based learning aligns with established educational theories, particularly experiential learning theory and competency-based education frameworks. Experiential learning emphasizes active engagement, reflection, conceptualization, and application—processes that are central to simulation design and debriefing practices. The International Nursing Association for Clinical Simulation and Learning (INACSL) has further strengthened the field through the development of evidence-based standards of best practice that guide simulation implementation, facilitation, and evaluation (INACSL Standards Committee, 2021). These standards underscore the importance of structured debriefing, clearly defined learning objectives, and validated assessment tools in optimizing learning outcomes.

Empirical evidence increasingly supports the effectiveness of simulation-based nursing education in enhancing clinical competency. Multiple meta-analyses report statistically significant improvements in psychomotor performance, clinical reasoning, and learner confidence following simulation exposure (Cant & Cooper, 2017; Shin et al., 2015). High-fidelity simulation has been shown to enhance students' ability to recognize patient deterioration, administer medications accurately, and execute emergency interventions. Moreover, structured debriefing methods are associated with improved knowledge retention and deeper clinical judgment development (Lee et al., 2016). These findings suggest that

simulation not only improves technical skills but also strengthens cognitive and affective dimensions of competence.

The integration of emerging technologies such as virtual reality and digital simulation platforms has further expanded the scope of simulation-based education. Recent meta-analyses indicate that virtual simulation can enhance knowledge acquisition and clinical reasoning, particularly in situations where access to physical simulation laboratories is limited (Chen et al., 2020; Liu et al., 2023). These innovations are especially relevant in the context of global disruptions, including pandemics, that restrict traditional face-to-face training. However, despite promising outcomes, concerns persist regarding cost, faculty preparation, technological infrastructure, and the standardization of competency assessment across institutions.

Although substantial research has examined various dimensions of simulation-based nursing education, findings remain dispersed across studies focusing on specific outcomes such as confidence, skill acquisition, or technology integration. There is a need for a comprehensive synthesis that consolidates theoretical foundations, empirical evidence on competency development, patient safety implications, and implementation challenges. Such synthesis is essential for informing curriculum development, faculty training, and policy decisions in nursing education.

Therefore, this literature review aims to synthesize existing evidence on the impact of simulation-based nursing education on clinical competency development. Specifically, the review examines (1) theoretical underpinnings of simulation-based learning, (2) effects on psychomotor skills and clinical performance, (3) influence on clinical judgment and decision-making, (4) contributions to patient safety and teamwork, and (5) implementation challenges and future directions. By integrating these domains, this review seeks to provide a comprehensive understanding of how simulation-based strategies can enhance the preparation of competent and practice-ready nurses in contemporary healthcare systems.

### **1.1 Conceptual Framework of Simulation-Based Nursing Education**

Simulation-based nursing education represents a transformative pedagogical approach designed to bridge the gap between theoretical knowledge and clinical practice. It provides structured, immersive learning environments where nursing students can engage in realistic patient-care scenarios without compromising patient safety. Unlike traditional apprenticeship models that rely solely on unpredictable clinical exposure, simulation creates controlled opportunities for deliberate practice, error correction, and reflective learning. The conceptual foundation of simulation-based education is grounded in experiential learning theory, competency-based education frameworks, and constructivist learning principles, all of which emphasize active participation, reflection, and progressive skill acquisition.

Experiential learning theory posits that meaningful learning occurs through concrete experience, reflective observation, abstract conceptualization, and active experimentation. Simulation mirrors this cycle by immersing learners in clinical scenarios, followed by structured debriefing sessions that promote reflection and conceptual integration. Debriefing, in particular, is recognized as a critical component of simulation effectiveness, as it facilitates cognitive processing and reinforces clinical reasoning. Within nursing education, this reflective process strengthens learners' ability to synthesize theoretical concepts with practical application, thereby enhancing clinical judgment and decision-making capacity.

Competency-based education further informs the framework of simulation-based learning. Clinical competency in nursing encompasses a multidimensional integration of knowledge,

psychomotor skills, communication abilities, ethical judgment, and professional behavior. Simulation provides measurable, performance-based assessment opportunities aligned with defined competency outcomes. Through objective structured clinical examinations (OSCEs), performance rubrics, and standardized evaluation tools, simulation enables educators to assess skill mastery systematically. This alignment between instructional design and competency measurement supports outcome-based education models increasingly adopted in global nursing curricula.

The International Nursing Association for Clinical Simulation and Learning (INACSL) Standards of Best Practice provide structural guidance for the effective implementation of simulation programs. These standards emphasize clearly defined learning objectives, appropriate scenario design, facilitator preparation, psychological safety, and outcome evaluation. The standards-based approach ensures consistency and quality across simulation experiences, promoting reliability in competency assessment. Moreover, simulation fidelity ranging from low-fidelity task trainers to high-fidelity mannequins and virtual reality environments allows educators to tailor experiences to specific learning objectives and developmental stages.

The integration of emerging technologies such as virtual simulation and immersive digital platforms further expands the conceptual framework. Virtual reality and screen-based simulation enhance accessibility, particularly in settings with limited physical laboratory infrastructure. These innovations align with flexible and technology-enhanced learning paradigms in higher education, supporting continuity of training during disruptions such as public health emergencies. Technology-driven simulation also facilitates repeated exposure to rare or high-risk clinical events, strengthening preparedness and response competence.

Despite its transformative potential, simulation-based education operates within contextual constraints that influence its effectiveness. Resource availability, faculty training, infrastructure support, and institutional policy significantly shape implementation quality. Inadequate facilitator preparation or poorly structured debriefing sessions may limit learning outcomes. Furthermore, the cost of high-fidelity equipment and maintenance presents barriers in resource-limited educational institutions. These contextual variables highlight the need for strategic planning, institutional commitment, and continuous faculty development to maximize the benefits of simulation-based training.

Within this conceptual framework, simulation-based nursing education functions as an interactive system that connects educational theory, structured experiential learning, competency measurement, and institutional support mechanisms. The framework positions simulation not merely as a teaching tool but as an integrated educational strategy aimed at enhancing clinical competency, promoting patient safety, and preparing nurses for complex healthcare environments.

## **1.2 Objectives of the Study**

1. To synthesize existing literature on simulation-based nursing education and its role in enhancing clinical competency.
2. To examine the theoretical foundations that support the integration of simulation in nursing education.
3. To evaluate empirical evidence on the impact of simulation-based learning on psychomotor skills, clinical judgment, and decision-making.

4. To analyze the influence of simulation-based training on learner confidence, self-efficacy, and patient safety outcomes.
5. To identify challenges, barriers, and implementation issues associated with simulation-based nursing education.
6. To explore emerging trends and future directions in simulation-enhanced nursing training, including virtual and technology-assisted platforms.

## **2. METHODOLOGY**

This study employed a narrative literature review design to synthesize existing empirical and theoretical research on simulation-based nursing education and its impact on clinical competency. The review aimed to examine how simulation-based learning influences psychomotor skill development, clinical judgment, decision-making, learner confidence, and patient safety outcomes in nursing education. A structured and systematic search strategy was utilized to identify relevant peer-reviewed studies published between 2014 and 2025.

The review process involved database searching, screening, eligibility assessment, and thematic synthesis. Emphasis was placed on high-quality empirical studies, randomized controlled trials, quasi-experimental designs, systematic reviews, and meta-analyses to ensure academic rigor and evidence reliability.

### **2.1 Literature Search Strategy**

A comprehensive literature search was conducted using major academic databases, including PubMed, Scopus, CINAHL, ERIC, ScienceDirect, and Google Scholar. The following keyword combinations were used:

- "simulation-based nursing education"
- "high-fidelity simulation" AND "clinical competency"
- "nursing simulation" AND "clinical judgment"
- "simulation training" AND "patient safety"
- "virtual simulation" AND "nursing education"
- "OSCE" AND "simulation nursing"

Boolean operators (AND, OR) were applied to refine search results. Reference lists of selected articles were also manually reviewed to identify additional relevant studies.

The initial search yielded a broad pool of articles. After removing duplicates and screening titles and abstracts, studies directly aligned with the objectives of the review were retained for full-text evaluation.

### **2.2 Inclusion and Exclusion Criteria**

Studies were included if they:

1. Were published between 2014 and 2025.
2. Were peer-reviewed journal articles.
3. Focused on simulation-based nursing education.
4. Examined outcomes related to clinical competency, skill performance, clinical judgment, decision-making, confidence, or patient safety.
5. Employed empirical research designs, systematic reviews, or meta-analyses.

Studies were excluded if they:

1. Focused on non-nursing disciplines.
2. Were opinion papers, editorials, conference abstracts, or unpublished theses.

- 3. Did not assess competency-related outcomes.
- 4. Discussed simulation without measurable educational impact.

Following screening and eligibility assessment, a total of selected studies were included for thematic synthesis.

### 2.3 Data Extraction and Thematic Analysis

Relevant data were extracted from each selected study, including author(s), year of publication, research design, sample characteristics, type of simulation employed, outcome measures, and key findings. Extracted data were organized into a literature matrix to facilitate comparison and synthesis.

A thematic analysis approach was employed to identify recurring patterns across studies. Findings were grouped into major themes, including: (1) theoretical foundations of simulation-based learning, (2) impact on clinical skill development, (3) enhancement of clinical judgment and decision-making, (4) contributions to patient safety and teamwork, and (5) implementation challenges and emerging trends. These themes structured the Results and Discussion section of the review.

**Table 1. Summary of Selected Studies on Simulation-Based Nursing Education**

Author(s)	Year	Research Design	Sample	Type of Simulation	Outcome Measures	Key Findings
Hayden et al.	2014	Randomized controlled longitudinal study	Pre-licensure nursing students	High-fidelity simulation replacing clinical hours	Clinical readiness, licensure performance	Up to 50% clinical hours replaced without compromising competency outcomes
Shin et al.	2015	Meta-analysis	Nursing students	Patient simulation	Clinical performance scores	Simulation significantly improved clinical competency compared to traditional methods
Cant & Cooper	2017	State-of-the-art review and meta-analysis	Pre-licensure nursing students	Simulation-based learning	Skill performance, knowledge	Positive impact on psychomotor skills and preparedness
Lee et al.	2016	Systematic review and meta-analysis	Undergraduate nursing students	Simulation with structured	Knowledge acquisition, reasoning	Debriefing significantly enhanced learning

Author(s)	Year	Research Design	Sample	Type of Simulation	Outcome Measures	Key Findings
					debriefing	outcomes
Kim et al.	2019	Meta-analysis	Nursing students	High- vs low-fidelity simulation	Competency development	Higher fidelity associated with stronger learning gains
Kaddoura	2016	Pretest–posttest experimental study	Nursing students	High-fidelity simulation	Critical thinking, self-confidence	Significant improvement in posttest scores
Yoo & Park	2015	Quasi-experimental study	Graduate nurses	Case-based and simulation-integrated learning	Problem-solving ability	Simulation-integrated learning improved problem-solving performance
Høegh-Larsen et al.	2023	Comparative study	Nursing students	Clinical simulation	Clinical judgment evaluation	Simulation participants demonstrated improved clinical judgment
Palagana et al.	2016	Conceptual/Program evaluation	Interprofessional learners	Team-based simulation	Interprofessional competency	Enhanced communication and collaborative skills
Chen et al.	2020	Meta-analysis	Nursing students	Virtual reality simulation	Knowledge acquisition	VR simulation improved knowledge and engagement
Liu et al.	2023	Meta-analysis	Nursing students	Virtual simulation	Clinical reasoning	Virtual simulation enhanced reasoning and learning retention

### **3. RESULTS AND DISCUSSION**

The synthesis of selected empirical studies, meta-analyses, and conceptual frameworks revealed consistent evidence that simulation-based nursing education contributes significantly to the development of clinical competency. However, the magnitude and sustainability of its impact depend largely on instructional design quality, fidelity level, faculty preparedness, and institutional support. The findings were organized into five interrelated themes: (1) theoretical and structural foundations of simulation, (2) psychomotor skill acquisition and measurable clinical performance, (3) enhancement of clinical judgment and higher-order thinking, (4) patient safety and interprofessional collaboration, and (5) implementation challenges and sustainability considerations.

#### **3.1 Theoretical Foundations and Structured Simulation Design**

The literature consistently positions simulation-based nursing education within experiential learning and competency-based education frameworks. Structured simulation allows learners to engage in realistic clinical scenarios, reflect on their actions, and integrate theoretical knowledge into practice. Evidence synthesized in meta-analytic studies demonstrates that structured debriefing significantly enhances learning outcomes, particularly knowledge acquisition and clinical reasoning (Lee et al., 2016). Debriefing functions as a cognitive consolidation process that transforms simulated experiences into transferable clinical insight.

Alignment with established standards strengthens the effectiveness of simulation programs. The INACSL Standards of Best Practice emphasize clearly defined objectives, psychological safety, trained facilitators, and systematic evaluation processes (INACSL Standards Committee, 2021). Programs adhering to these standards report stronger competency gains compared to simulation activities implemented without structured frameworks. Research examining fidelity levels further indicates that high-fidelity simulation environments often produce greater engagement and improved performance outcomes (Kim et al., 2019). However, instructional design quality and facilitator competence frequently exert more influence than technological sophistication alone.

The large-scale National Council of State Boards of Nursing (NCSBN) study provides compelling support for structured simulation integration. Findings revealed that replacing up to 50% of traditional clinical hours with high-quality simulation did not negatively affect licensure examination results or clinical readiness (Hayden et al., 2014). This evidence reinforces the legitimacy of simulation as a pedagogically sound alternative when implemented within structured and theory-informed frameworks.

Despite strong theoretical grounding, inconsistencies in curricular integration remain evident across institutions. Variability in faculty preparation and resource availability affects the uniformity of simulation implementation. Programs embedded longitudinally within curricula demonstrate more sustained outcomes compared to isolated simulation sessions. These findings highlight the importance of systemic curricular alignment rather than fragmented adoption.

#### **3.2 Psychomotor Skill Acquisition and Clinical Performance**

Enhancement of psychomotor skills represents one of the most consistently reported outcomes in simulation-based nursing education research. A meta-analysis conducted by Shin et al. (2015) demonstrated statistically significant improvements in clinical performance

among nursing students exposed to simulation compared with traditional instructional approaches. Similarly, Cant and Cooper (2017) concluded that simulation-based learning significantly improves procedural competence and clinical preparedness in pre-licensure nursing education.

Experimental and quasi-experimental studies provide further support. Kaddoura (2016) reported significant improvements in critical thinking and self-confidence following high-fidelity simulation exposure, while Yoo and Park (2015) observed enhanced problem-solving abilities in learners participating in case-based and simulation-integrated instruction. These findings suggest that simulation facilitates deliberate practice and immediate corrective feedback, conditions essential for skill mastery.

Objective performance measures such as OSCEs confirm measurable competency gains. Learners demonstrate improved adherence to protocols, enhanced medication safety practices, and greater accuracy in patient assessment after structured simulation training. Repeated exposure to complex scenarios, including emergency response situations, allows learners to refine technical skills in controlled settings without compromising patient safety.

Nevertheless, sustained psychomotor improvement depends on repeated and progressive simulation exposure. Short-term interventions yield measurable gains; however, longitudinal curricular integration produces more durable competency development. Institutional commitment to systematic simulation programming therefore remains essential for long-term skill retention.

### **3.3 Development of Clinical Judgment and Critical Thinking**

Clinical competency extends beyond procedural accuracy to include higher-order cognitive processes such as clinical judgment and analytical reasoning. Simulation-based education creates environments where learners must interpret evolving patient data, prioritize interventions, and make time-sensitive decisions. Evidence indicates that simulation participants demonstrate stronger clinical judgment compared to peers relying primarily on observational clinical experiences (Høegh-Larsen et al., 2023).

Meta-analytic findings further support improvements in critical thinking following simulation exposure (Shin et al., 2015). Structured debriefing plays a central role in reinforcing cognitive growth. Reflective discussions allow learners to analyze reasoning processes, recognize knowledge gaps, and reconstruct decision-making strategies. This process strengthens metacognitive awareness and promotes transfer of learning into real clinical contexts.

High-fidelity simulation contributes to cognitive immersion, particularly in scenarios involving patient deterioration or complex pathophysiological conditions (Kim et al., 2019). Exposure to rare but high-risk clinical events enhances preparedness and reduces hesitation in real-world settings. However, the magnitude of cognitive gains varies based on scenario design complexity and facilitator expertise. Cumulative simulation experiences across academic levels produce more consistent development of clinical reasoning than single-session interventions.

### **3.4 Patient Safety and Interprofessional Collaboration**

Patient safety remains a central justification for the integration of simulation in nursing education. The NCSBN national simulation study demonstrated that substantial substitution of clinical hours with simulation did not compromise competency outcomes or licensure

success (Hayden et al., 2014). These findings validate simulation as a safe alternative that preserves educational rigor while reducing patient risk exposure.

Simulation provides structured rehearsal for high-stakes clinical events, including cardiac arrest management and medication error prevention. Repeated practice in simulated crisis environments enhances confidence and procedural accuracy. Kaddoura (2016) observed increased self-confidence among learners following high-fidelity simulation, which may influence willingness to engage actively in real clinical settings.

Interprofessional simulation further strengthens teamwork competencies. Palaganas et al. (2016) emphasized that collaborative simulation programs enhance communication, coordination, and shared decision-making among healthcare learners. Effective teamwork reduces medical errors and supports patient safety initiatives. Integration of interprofessional scenarios within simulation curricula aligns with global healthcare standards emphasizing collaborative practice as essential to quality care.

Despite strong evidence for preparedness outcomes, long-term data linking simulation training directly to measurable reductions in clinical error rates remain limited. Continued research examining patient-level outcomes is necessary to strengthen the evidence base.

### **3.5 Implementation Challenges and Sustainability**

Although simulation-based nursing education demonstrates substantial benefits, implementation barriers remain prominent. Financial investment required for high-fidelity mannequins, laboratory infrastructure, and maintenance costs poses significant challenges, particularly in resource-constrained institutions. Cant and Cooper (2017) noted variability in program quality, often reflecting disparities in institutional support and funding capacity.

Faculty competence significantly influences simulation effectiveness. Effective facilitation requires expertise in scenario design, learner assessment, and debriefing methodology. Insufficient faculty development may limit learning outcomes despite technological availability. Consistent professional training programs are therefore essential for sustaining simulation quality.

Standardization of competency assessment also presents challenges. Variation in outcome measurement tools complicates cross-study comparisons and limits generalizability. Adoption of structured assessment frameworks can enhance accountability and comparability across institutions.

Emerging digital innovations such as virtual reality offer scalable alternatives to traditional laboratory-based simulation. Meta-analytic evidence indicates that virtual simulation enhances knowledge acquisition and engagement (Chen et al., 2020; Liu et al., 2023). While promising, further investigation into long-term retention and cost-effectiveness remains necessary.

Overall, simulation-based nursing education demonstrates strong evidence for enhancing clinical competency across psychomotor, cognitive, and collaborative domains. Sustainable implementation requires institutional investment, faculty development, standardized evaluation systems, and integration of emerging technologies to ensure equitable access and consistent quality.

## 4. CONCLUSION

Simulation-based nursing education has emerged as a transformative instructional strategy in response to growing concerns about clinical preparedness and competency gaps among nursing graduates. The increasing complexity of healthcare systems, limitations in clinical placement opportunities, and heightened emphasis on patient safety have necessitated innovative approaches to experiential learning. The literature reviewed in this study consistently demonstrates that simulation-based education enhances psychomotor skill performance, strengthens clinical judgment, improves learner confidence, and contributes to patient safety preparedness. When implemented in alignment with established standards and structured debriefing practices, simulation provides measurable and sustainable competency gains.

Empirical findings from randomized, quasi-experimental, and meta-analytic studies indicate that simulation-based training significantly improves clinical performance outcomes compared to traditional lecture-based instruction alone. High-fidelity simulation environments allow repeated practice of complex procedures, enabling learners to develop technical accuracy and procedural fluency in a controlled setting. Moreover, simulation fosters reflective learning processes that enhance cognitive integration and decision-making capacity. These outcomes reinforce the role of simulation as more than a supplementary teaching tool; rather, it functions as an essential component of competency-based nursing education.

Beyond individual skill development, simulation-based education contributes to system-level improvements in patient safety and interprofessional collaboration. By providing safe environments for managing high-risk clinical scenarios, simulation reduces the likelihood of errors during real patient encounters. Interprofessional simulation experiences further strengthen communication, teamwork, and crisis coordination competencies that are critical in modern healthcare delivery. The integration of structured teamwork training within simulation scenarios enhances collective clinical responsiveness and aligns with global patient safety initiatives.

Despite these strengths, several challenges continue to influence the implementation and sustainability of simulation-based programs. High financial costs associated with equipment, laboratory infrastructure, and technology maintenance remain significant barriers, particularly in resource-limited institutions. Additionally, faculty readiness and facilitator expertise are crucial determinants of simulation effectiveness. Without adequate training in scenario design and debriefing techniques, simulation experiences may fail to achieve intended learning outcomes. Variability in assessment tools and inconsistent integration within curricula further limit the standardization of competency evaluation.

Emerging digital platforms, including virtual and augmented reality technologies, offer promising avenues for expanding access to simulation-based learning. These innovations may reduce infrastructure dependency and enhance scalability, particularly in settings where traditional laboratory facilities are limited. However, continued research is necessary to examine long-term competency retention, cost-effectiveness, and the transferability of simulation-acquired skills to real clinical practice.

In summary, the evidence synthesized in this review affirms that simulation-based nursing education plays a critical role in enhancing clinical competency across cognitive, psychomotor, and affective domains. While implementation challenges remain, strategic institutional planning, investment in faculty development, adherence to evidence-based

standards, and integration of emerging technologies can strengthen the effectiveness of simulation programs.

## COMPETING INTERESTS

The author declares that there are no financial or personal relationships with any individuals or organizations that could inappropriately influence or bias the work presented in this manuscript. No consultancies, honoraria, paid expert testimony, patent applications, or external funding sources are associated with this study.

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