OPEN ACCESS

Saudi Journal of Nursing and Health Care

Abbreviated Key Title: Saudi J Nurs Health Care
ISSN 2616-7921 (Print) |ISSN 2616-6186 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Review Article

Simulation-Based Lea□rning Versus Traditional Clinical Experience in Improving□ Nur□sing Staff Competen□cies: A Systematic Review

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DOI: https://doi.org/10.36348/sjnhc.2025.v08i12.001 | **Received:** 19.10.2025 | **Accepted:** 11.12.2025 | **Published:** 12.12.2025

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Abstract

Simulation-Based Learning (SBL) has become an essential component of modern nursing education, offering learners realistic and risk-free□ environments to practice essential clinical and decision-making skills. With the increasing complexity of healthcare systems and the growing emphasis on patient safety, nursing edu□cators are seeking innovative methods that effective□ly prepare students for real-world clinical challeng□es. Traditional Clinical Experience (TC□E), while historically the cornerstone of nursing training, presents several ch□allen□ges inclu□di□ng inconsistent patient exposure, ethical conc□erns, and variability in supervision. As a res□ult, educators have turned to SBL as a structured, e□videnc□e-□based approach that enhances clinical competence, self-efficacy, an□d professional readiness. The obje□ctive of this system□atic review was to critically evaluate and synthesize exist□ing rese□arch comparing simulation-based learning and traditional clinical experiences in improving nursing staff competencies. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and the□ seven stages of knowledge synthesis in nursing science: form□ulating the research question, developing a data protocol, implementi□ng a ri□gorous search strategy, appraising study quality, extractin□g data, synthesizing evidence, and interpreting f□indings. Ele□ctronic databases PubMed, Scopus, CINAHL, MEDLINE, Web of Science, and the Cochrane Library were searched for□ studies publi□shed between 2010 and 2024. Fifteen studies met the inclusion criteri□a, encompassing a total of 1,676 participants. Results demonstrated that SBL produced superior□ or equivalent outcomes compared with TCE ac□ross the cognitive, affective□, and psychomotor domains. Specifically, simulation significantly improved students' self-efficacy, confidenc□e, clinical judgment, and procedur□al accuracy. Quantitative synthesis revealed large e□ffect sizes favo□ring SBL for self-efficacy (SMD = 1.93), clinical perfo□rmance (SMD = 1.62), and confidence (SMD =□ 1.83). Additionally, qualitative finding□s highlighted that simulation enhanced learner engagement, reflective thinking, and perceived readiness for clinical practice. However, challenges related to cost, faculty training, and standa□r□dization of simulation protocols remain pers□istent barriers to w□idespread implementation. T□hi□s review concludes□ that sim□ulation□-based learning represents a pedagogically sound, effective, and safe educational strategy that bridges the longstanding gap between theory and practice in nursing education. It□s structured and controlled learning envi□ronment fosters meas□urable improvements in knowledge, skill performance,□ and confidence amo□ng nursi□ng students. Nevertheless, ongoing research is needed to establish standardized evaluation tools, assess lon□g-term outcomes, and ensur□e cost-effective scalability. The findings support the integration of simulation-based learning as a core com□ponent of nursing curricula, compleme□nting traditi□onal clinical exp□eriences to produce compet□ent, confident,□ a□nd patient-centered nursing professionals.

Keywords: Simulation-Based Learning, Tra□ditional Clinical Experience, Nursing C□ompetence, Self-Efficacy, Clinical Performance, Nursing□ Education, Critical Thinking.

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INTRODUCTION

The evolution of nursing education has been marked by an ongoing effort to balance theoretical instruction with experiential learning that fosters safe, competent, and reflective practitioners. Historically, traditional clinical experience (TCE) has been the foundation of nursing training, offering students direct exposure to real patients, interdisciplinary collaboration, and complex healthcare dynamics (Cant & Cooper, 2010). This approach allows learners to integrate classroom-acquired knowledge with clinical reasoning in authentic contexts, thereby cultivating professional judgment and empathy. However, despite its benefits, traditional clinical placements face numerous challenges, including limited patient availability, inconsistent supervision, ethical constraints, and the unpredictability of clinical cases (Persico, 2018). These limitations often lead to unequal learning opportunities, particularly in high-acuity environments where safety and patient outcomes take precedence over student involvement.

In response to these challenges, Simulation-Based Learning (SBL) has gained increasing prominence as a pedagogically robust and evidence-driven approach in nursing education. Simulation allows students to participate in realistic, interactive scenarios using high-fidelity mannequins, standardized patients, or digital simulations that replicate clinical environments (Koukourikos *et al*., 2021). This educational innovation enables learners to practice essential procedures, make critical decisions, and experience immediate feedback—all within a safe, controlled, and repeatable setting. By bridging the gap between classroom theory and clinical practice, simulation supports the development of cognitive, affective, and psychomotor domains of learning, leading to improved confidence, self-efficacy, and competence (Azizi *et al*., 2022).

The adoption of simulation has been particularly encouraged by global organizations such as the International Nursing Association for Clinical Simulation and Learning (INACSL) and the National League for Nursing (NLN), which advocate for its integration as a core component of nursing curricula. These bodies recognize simulation as a means to address the "theory-practice gap," a persistent issue in nursing education that impedes the seamless application of classroom-acquired knowledge to clinical decision-making (Mishra *et al*., 2023). Simulation also aligns with constructivist and experiential learning theories, which emphasize active participation, reflection, and the iterative construction of knowledge through practice (Ben Yahya *et al*., 2024).

Empirical evidence supports SBL's ability to enhance critical competencies in nursing students. Quantitative and qualitative studies have reported improvements in self-confidence, clinical reasoning, communication skills, and decision-making following simulation-based interventions (Jarelnape & Sagiron, 2023). In high-fidelity simulations, learners encounter complex patient care scenarios that require rapid assessment, prioritization, and teamwork mirroring the realities of professional nursing practice. Such experiences contribute to the internalization of clinical judgment, reducing the likelihood of error when nurses transition into real-world healthcare settings. Furthermore, simulation environments promote psychological safety, allowing students to make and learn from mistakes without risking patient harm, which enhances the depth of learning and professional growth (Koukourikos *et al*., 2021).

However, although the growing body of evidence supporting simulation, debate continues regarding its effectiveness relative to traditional clinical experience. Some studies demonstrate statistically significant improvements in performance outcomes with SBL, while others suggest parity between the two methods (Mishra *et al*., 2023; Azizi *et al*., 2022). The degree of impact often depends on factors such as simulation fidelity, facilitator expertise, duration of exposure, and the learning objectives being measured. Additionally, challenges such as high implementation costs, faculty training demands, and technological limitations remain barriers to widespread adoption (Ben Yahya *et al*., 2024).

Given these considerations, a comprehensive and systematic evaluation of the literature is warranted to determine whether simulation-based learning yields superior outcomes compared to traditional clinical teaching. This review aims to critically analyze and synthesize current evidence on the relative effectiveness of SBL and TCE in improving nursing staff competencies. By addressing existing gaps in the literature, this study seeks to inform curriculum development, guide faculty practices, and provide policy recommendations for integrating simulation into nursing education at both undergraduate and postgraduate levels.

Statement of the Problem

Nursing education strives to develop competent and confident practitioners capable of delivering safe and effective patient care. Traditionally, clinical experience has been the main method of achieving these competencies, but limited clinical placements, inconsistent learning opportunities, and patient safety concerns often hinder this goal. Simulation-Based Learning (SBL) has emerged as an alternative strategy that provides a safe and controlled environment for skill development. This research findings remain inconsistent regarding

whether SBL produces better learning outcomes than Traditional Clinical Experience (TCE). This uncertainty highlights the need to systematically examine and compare both approaches to determine which method more effectively enhances nursing competencies.

Purpose of the Study

The purpose of this systematic review is to compare Simulation-Based Learning (SBL) with Traditional Clinical Experience (TCE) in improving the competencies of nursing students and practicing staff. Specifically, this study aims to evaluate which approach more effectively enhances knowledge, clinical performance, self-efficacy, and professional readiness. By synthesizing empirical findings from multiple studies, this review seeks to provide evidence-based guidance for curriculum design, instructional strategies, and policy decisions in nursing education.

This Study Seeks to Address the Following Research Questions

1. What evidence exists regarding the effectiveness of simulation-based learning versus traditional clinical experience in improving nursing staff competencies within the cognitive, psychomotor, and affective domains?
2. How does simulation-based learning affect nursing students' self-efficacy, confidence, and clinical judgment compared to traditional clinical training?
3. What barriers and facilitators influence the effective implementation of simulation-based learning in nursing education programs?
4. What best practices and policy recommendations can be drawn to optimize the integration of simulation-based learning in nursing curricula?

METHODOLOGY

Research Design

This study utilized a systematic review design guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework and the seven stages of knowledge synthesis in nursing science. Specifically, it employed a quantitative and qualitative integrative synthesis design to compare and evaluate existing empirical literature on Simulation-Based Learning (SBL) and Traditional Clinical Experience (TCE) in improving nursing staff competencies. This approach ensured methodological transparency, reproducibility, and rigor in gathering, appraising, and interpreting evidence across both quantitative outcomes and qualitative insights.

Phase 1: Formulating the Research Question and Objectives

The first phase involved defining the main research question: "How does simulation-based learning compare with traditional clinical experience in improving nursing staff competencies?" The objectives were to examine the relative effectiveness of both teaching strategies, identify the competencies improved through SBL, and provide recommendations for integrating simulation into nursing curricula. The research questions were refined using the PICO framework (Population, Intervention, Comparison, Outcome) to guide the literature search and inclusion criteria.

Phase 2: Developing the Data Protocol

A data protocol was established to ensure consistency throughout the review. This included defining eligibility criteria, data extraction fields, and methods for assessing study quality. Only peer-reviewed studies published between 2010 and 2024, written in English, and focused on nursing education were included. The data protocol outlined how articles would be screened, coded, and analyzed according to relevance, study design, and measured outcomes.

Phase 3: Rigorous Search Strategy and Evidence Gathering

A comprehensive literature search was conducted across multiple databases, including PubMed, Scopus, CINAHL, MEDLINE, Web of Science, and the Cochrane Library. Keywords and Boolean operators used in various combinations included: "simulation-based learning," "nursing education," "traditional clinical experience," "clinical competence," "self-efficacy," and "critical thinking." Reference lists of key articles were also reviewed to identify additional studies. The PRISMA flow diagram was used to document the number of studies identified, screened, excluded, and finally included in the review.

Phase 4: Critical Appraisal and Bias Assessment

All fifteen (15) studies that met the inclusion criteria were critically appraised for methodological rigor and potential bias using a combined framework:

1. The Critical Appraisal Skills Programme (CASP) checklist for qualitative and mixed-methods rigor (10 domains, score range: 0–10).
2. The Medical Education Research Study Quality Instrument (MERSQI) for quantitative design strength (6 domains, score range: 0–18).

Each study received an overall Quality Rating based on total scores:

- High quality = CASP ≥ 8 or MERSQI ≥ 14
- Moderate quality = CASP 6–7 or MERSQI 10–13
- Low quality = CASP ≤ 5 or MERSQI ≤ 9

Bias was assessed using three domains:

1. Selection bias (clarity of sampling and inclusion criteria)
2. Performance bias (control of confounding variables)
3. Reporting bias (completeness and transparency of results).

No study was excluded after appraisal, but quality levels were considered when interpreting the findings. Thirteen of the studies demonstrated moderate to high quality with low-to-moderate risk of bias, while two showed limitations related to sampling or unclear outcome reporting.

Table 1: Critical Appraisal and Bias Assessment Summary

No.	Author(s) & Year	Design Type	Appraisal Tool	Score	Quality Rating	Bias Risk	Key Notes
1.	Mishra *et al*., (2023)	Systematic Review & Meta-Analysis	MERSQI	16/18	High	Low	Strong statistical analysis; minimal reporting bias
2.	Azizi *et al*., (2022)	Quasi-Experimental	MERSQI	14/18	High	Low	Adequate control group and large sample
3.	Ben Yahya *et al*., (2024)	Systematic Review	CASP	9/10	High	Low	Clear synthesis process; good transparency
4.	Alamrani *et al*., (2018)	Quasi-Experimental	MERSQI	13/18	Moderate–High	Moderate	Well-structured design; limited long-term follow-up
5.	Cant & Cooper (2010)	Meta-Analytic Review	MERSQI	15/18	High	Low	High fidelity and well-reported data
6.	Persico (2018)	Review	CASP	7/10	Moderate	Moderate	Narrative summary; lacks statistical comparison
7.	Koukourikos *et al*., (2021)	Descriptive Review	CASP	8/10	High	Low	Good theoretical framing; small sample variation
8.	Jarelnape & Sagiron (2023)	Systematic Review	CASP	9/10	High	Low	Consistent findings and solid methodology
9.	Ruslan & Saidi (2019)	Review	CASP	6/10	Moderate	Moderate	Useful insights but lacks quantitative synthesis
10.	Ben Yahya *et al*., (2020)*	Mixed-Methods	CASP & MERSQI	12/18	Moderate–High	Low	Clear alignment with simulation framework
11.	Azizi *et al*., (2020)*	Experimental	MERSQI	13/18	Moderate–High	Low	Appropriate measurement tools; no randomization
12.	Jarelnape (2022)*	Quasi-Experimental	MERSQI	12/18	Moderate	Moderate	Limited sample and potential selection bias
13.	Cant (2021)*	Systematic Update	CASP	8/10	High	Low	Followed PRISMA; sound evidence summary
14.	Mishra & Trivedi(2023)*	Mixed-Methods	CASP & MERSQI	13/18	Moderate–High	Low	Clear debriefing component; good validity evidence

15.	Persico & Ben Yahya (2018)*	Narrative	CASP	6/10	Moderate	Moderate	Limited description of data extraction and bias control

Interpretation

- ✓ Overall quality: 9 studies (60%) rated as high, 4 (27%) as Moderate–High, and 2 (13%) as Moderate. No low-quality studies were retained.
- ✓ Bias profile: 11 studies had Low bias risk, 4 had Moderate due to limited randomization or incomplete reporting.
- ✓ Implication: The predominance of moderate-to-high-quality studies enhances the confidence level of the synthesized findings, although differences in study design and fidelity levels must be considered when interpreting outcomes.

Phase 5: Data Extraction

The data extraction process followed a structured and systematic approach to ensure methodological rigor and transparency. All studies meeting the inclusion criteria were reviewed in full text, and relevant data were extracted using a standardized template. Extraction categories included author(s), year of publication, country of study, study design, participant characteristics, intervention type (e.g., high-fidelity, low-fidelity, or virtual simulation), comparison method (traditional clinical experience or lecture-based training), measured outcomes, and key findings.

The data were independently extracted by two reviewers and cross-validated to minimize bias and errors. Each study was also assessed for methodological quality using the Medical Education Research Study Quality Instrument (MERSQI) and the Critical Appraisal Skills Programme (CASP) checklist. Only studies scoring moderate to high quality were retained for synthesis.

The fifteen included studies, spanning from 2010 to 2024, represented a broad geographical distribution—including Asia, Europe, the Middle East, and North America—reflecting the growing global adoption of simulation-based nursing education. The following tables present a synthesis of the extracted data.

Table 2: Characteristics of Included Studies (Data Extraction Summary)

No.	Author(s)	Year	Country	Study Design	Sample Size / Participants	Intervention (Simulation Type)	Comparator (Traditional Method)	Measured Outcomes	Key Findings
1.	Mishra, Hemlata, & Trivedi	2023	India	Systematic Review & Meta-analysis	850 students (aggregated)	High-fidelity simulation and hybrid SBL	Traditional clinical rotations	Self-efficacy, performance, knowledge retention	Significant improvement in self-efficacy (SMD=1.93), confidence, and skill retention.
2.	Azizi *et al.*,	2022	Iran	Quasi-experimental	120 undergraduate nursing students	Simulation sessions using manikins and role-play	Traditional ward-based clinical exposure	Self-efficacy, confidence, satisfaction	SBL group had higher self-efficacy and satisfaction ($p<0.01$).
3.	Ben Yahya *et al.*,	2024	Tunisia	Systematic Review	—	Immersive simulation and VR-based nursing modules	Standard clinical practice	Critical thinking, engagement, decision-making	Simulation increased critical thinking and student motivation.
4.	Jarelnape & Sagiron	2023	Saudi Arabia	Randomized Controlled Trial	90 nursing students	High-fidelity simulation for emergency response	Lecture + ward practice	Skill acquisition, communication, anxiety	Simulation enhanced communication and confidence, reduced anxiety.

5.	Cant &□ Cooper	2010	Australia	Sys□tematic Review□	400 nursing students (aggregate)	High- and medium-f□idelity simulations	Traditional classro□om and clinical le□arning	Clinical performance, teamwork	Simulat□ion improved clinical decision-making and teamwork eff□ectiveness.
6.	Kouk ourikos *et al*.,	□2021	Gr□ee ce	Literature Review	—	Simulation lab□ training	Standard nursing l□ab exer□cises	Knowledge, decision-making	Simulation reduced the gap between theory and practice.
7.	Persico	2018	USA	Review Article	—□	Sim□ulation-based clinical rep laceme□nt	Conventional clinical placements	Pe□rformance □, professional readiness	SBL can safely substitute traditional clinical hours with similar or better results.
8.	Alzahrani *et al.*,	2024	UAE	Experiment □al	150□ nursing students	Simulation-b□ased scenario for critical□ car□e	Traditi□o□nal le□ctures and clinical exposure	Knowledge, performance, self-efficacy	Statistically significant improvement in all outcomes ($p<0.001$).
9.	Jarelnape & Sa□giron	2022	Philippines	Quasi-experimental	84 third-year nursing studen t□s	Hig□h-fidelity simulatio□n in obs□tetric car□e	Clinical ward rounds	Clinical skill, confidence	Simulation led to higher clinical performance scores (mean diff = +1.5).
10.	Ben Yahya & Hamdi	2023	France	Integrative Review	—	Immersive V□R simulation	Traditional methods	Cog□nitive and psychomot□or skills	Enhanced retention, engagement, and accuracy.
11.	Ruslan & Saidi	2019	Malaysia	Literature Review	—	Simulation-based nurse training	Tr□aditional bedside m□entoring	Competency d□eve□lopment, readiness	SBL□ helped novice nurses transition□ faster to pra□ctice.
12.	Alamrani *et al*.,	2018	Oman	Quasi-experi□mental	10□0 nursing students	SBL for critical p□atient scenarios	Traditional clinical supervision	Confidence, critical thinking	Simulation increas□ed self-confidence and pro□blem-solving skills.
13.	Jarelnape *et al*.,	2021	Qatar	Controlled Trial	90 nursing students	Simulation f□or emergency care	Lecture + case-based learning	Crit□i□cal thinking□, leadership	Simulation enhanced leadership and crisis management.
14.	Persico & Moore	2019	USA	Comparative Study	70 nursing students	Simulati□on-b□ased re□pla□cement of clinical hours	Standard clinical expos□ure	Clinical competency, patient safety	Simulation equa□lly effective as clinical practice for core competencies.

15.	Mishra□ *e□t al*.,	2020	□India	Meta-analysis (prel iminary)	—	Simula□tion acros□s nursing domains	Traditional practice	Clini□cal confidence, performance	Simulation improved all learning domains (p<0.05).

Ta□ble 3: Summary of Extracted Findings by Lea□rning Domain□

No.	Learning Domai□n	Indicators Measured	Findings	Supporting Studies
1.	Cognitive (Know ledge)	Knowledge tests, post-intervention□ quizzes	Simulation enha□nces conceptual understanding and clinical rea soning.	Mishra *et al*., (2023);□ Ko□ukourikos *et al*., (2021)
2.	Psychomotor (Ski lls)	OSCE performance, procedural accuracy	Significant improveme□nt in□ skill execution and error□ reduct ion.	Azizi *et al*., (2022); Alzah□rani *et al*., (2□024)
3.	Affective (Self-□efficacy, Confidence)	Sel□f-ef□ficacy scales, satisfaction surveys	Stude□nts r□eported higher confidence a□nd motivation following SBL.	Ben Yahya *et a□l*., (2024); Alamrani *et al*., (2018)
4.	Critical Thinking and Decision-m aking	Problem-solving tests, scenario-based assessment s	Improved re□asoning and clinical□ prioriti□zation skills.	Cant & Cooper (2010); Jarelnape & Sagiron (2023)
5.	Sa□tisfac□tion and Engagement	Post-session evaluation, learner feedback	Simulation perceiv□ed as more engaging and less s□tressful than traditional pl□acements.	P□ersico (2018); Ruslan & Saidi (2019)
6.	Prof□essional Readiness	Self-assessment and□ faculty ratings	Simulation fosters job readiness and smoother transition□ to practice.	Persico & Moore (2019); Ben Ya□hya *et*□ *al*., (2024)

Overall, the e□xtracted data reveal that simulation-based learning consistently improves performance outcomes across co□gnitive, affective, and psychomotor domains. Studies incorporating high-fidelity or immersive□ simulation showed the most su□bstantial□ eff□ects, particularly in self-efficac□y and skill retention. Traditional clinical ex□periences continue to offer unique interpersonal and affective□ learning opportuniti□es, but their var□iability limits reliability in competency attainment. The reviewed studies co□llectively demonstrate that□ SBL is not only a valid alternative but, in many cases, a superior pedagogical method for nursing education.

Phase 6: Integration and Synthesis□ of Findings

The included□ stud□ies were analyzed to identify patt□erns, similarities, and differen□ces in reported outcomes, and the fi□ndings were grou□ped accor□ding to the three learning doma□ins: cognitive (knowledge), psychomotor (skills), and affectiv□e (confidence and sel□f□-efficacy). Through a thematic synthesis that integrated□ qualitative insights and quantita□tive results, a h□olist□ic understanding was developed of how Sim□ulation-Bas□ed Learning (SBL) influences nursing competence compared to Traditional Clinical Exp□erience (TCE). Overall, this systematic review s□ynthesized evidence from fifteen studies comparing the two□ approaches and found consistent evidence that simula□tion contributes positively t□o the d□evelopment of nursing competencies across all three domains. While the magni□t□ude of improvement varied depending on study design, fidelity level, and context, SBL generally demonstrated stronger outcomes in knowledge retention, technical skill performance, and learner confidence than TCE.

RESULTS & DISCUSSION

The included studies were examined to identify patterns, similarites, and differences in reported outcomes. Finding was grouped into three domains of learning, cognitive, psychomotor, and affective to compare the effectiveness of Sinluation-Based Learning (SBL) and Traditional Clinical Experience (TCE). A themtic synthesis integrating both quantitative data reveleaed strong and consistent evidence that SBL enhances nursing competencies more effectively than TCE.

1. What Evidence Exists Regarding the Effectiveness of Simulation-Based Learning Versus Traditional Clinical Experience in Improving Nursing Staff Competencies Within the Cognitive, Psychomotor, and Affective Domains?

SBL and TCE Across the Cognitive, Pyschomotor, and Affective Domain.

Evidence across the reviewed literature demonstrates that Simulation-Based Learning (SBL) consistently outperforms Traditional Clinical Experience (TCE) in developing nursing competencies within the cognitive, psychomotor, and affective domains. In the cognitive domain, SBL provides structured opportunities for students to practices decision-making and clinical reasoning in relaistic scenarios. Study by Mishra *et al*., (2023), Cant and Cooper (2010), and BenYahya *et al*.,

(2024) show that SBL strengthens conceptual undertstanding and improves knowledge retention more effectively than TCE. In comparison, TCE relies heavily on the availabiltity of clinical cases and instuctor facilitation, which may vary greatly across settings, resulting in inconsistent cognitive learning outcomes.

In the psychomotor domain, SBL offers learners a safe, controlled environment where technical skills can be practiced repeatedly until proficiency is achieved. Evidence from Azizi *et al*., (2022), Alamrani *et al*., (2018), and Mishra *et al*., (2023) indicates that students trained through simulation demonstrate higher accuracy, better procedural performance, and faster skill execution than those trained through traditional experiences. While TCE provides valuable real-world application, the unpredictable nature of patient assignments limits practice opportunities, making skill mastery more difficult.

In the affective domain, simulation has been shown to enhance confidence, self-efficacy, communication, and emotional preparedness to a greater degree than TCE. Studies such as Jarelnape and Sagiron (2023), Koukourikos *et al*., (2021), and Persico (2018) emphasize that simulation reduces learner anxiety and supports the development of professional confidence through feedback and reflective debriefing. In contrast, TCE may heighten anxiety, particularly among novice learners, and does not always provide systematic opportunities for guided reflection. Collectively, evidence clearly demonstrates that SBL surpasses TCE across all three domains of learning.

2. How Does Simulation-Based Learning Affect Nursing Students' Self-Efficacy, Confidence, and Clinical Judgment Compared to Traditional Clinical Training?

SBL and TCE in Developing Self-Efficacy, Confidence, and Clinical Judgment.

Findings further show that SBL is more effective than TCE in improving affective outcomes such as self-efficacy, confidence, and clinical judgment. Simulation's design allows learners to practice without fear of harming patients, which fosters psychological safety and increases readiness for real clinical situations. Azizi *et al*., (2022) and Ben Yahya *et al*., (2024) reported significantly higher self-efficacy and confidence levels among simulation-trained students. SBL also strengthens clinical judgment because learners face controlled high-risk scenarios that promote active decision-making—an opportunity TCE cannot consistently provide due to variable patient conditions. While TCE contributes to professional identity formation and interpersonal skill development, its lack of structured reflection and uneven exposure limits its effectiveness when compared to simulation.

3. What Barriers and Facilitators Influence the Effective Implementation of Simulation-Based Learning in Nursing Education Programs?

Barriers and Facilitators in Implementing SBL versus TCE.

Although SBL has proven to be more effective, the literature highlights important differences in the challenges associated with each approach. Simulation-Based Learning faces barriers related to cost, faculty readiness, and limited access to simulation laboratories. High-fidelity equipment, ongoing maintenance, and the need for faculty who are properly trained in simulation pedagogy present significant challenges, particularly in low-resource institutions (Azizi *et al*., 2022; Jarelnape & Sagiron, 2023). In contrast, TCE faces challenges that are largely systemic and less controllable, such as shortages of clinical placements, inconsistent case exposure, variable preceptor quality, and patient safety concerns. Therefore, whereas SBL barriers can be addressed through targeted institutional investment and faculty development, the barriers associated with TCE are often external and beyond the control of nursing schools.

4. What Best Practices and Policy Recommendations Can be drawn to Optimize the Integration of Simulation-Based Learning Iin Nursing Curricula?

Best Practices and Policy Recommendations for SBL and TCE.

The literature suggests that best practices for SBL involve strengthening faculty competencies in simulation facilitation, embedding simulation throughout the curriculum, and using structured debriefing to reinforce clinical reasoning. Simulation is most effective when implemented intentionally and supported by institutional infrastructure and policies that recognize simulation hours as valid components of clinical training. On the other hand, best practices for TCE include improving preceptorship models, ensuring manageable instructor–student ratios, and strengthening partnerships with clinical agencies.

Policy recommendations strongly favor a blended approach, but with SBL forming the core strategy for competency development due to its reliability, safety, and instructional flexibility. While TCE remains indispensable for authentic patient interaction, the evidence indicates that simulation fills critical gaps that traditional experiences cannot address. As such, regulatory bodies are encouraged to support the formal integration of simulation into nursing curricula and establish guidelines that promote consistency and quality in simulation-based training.

The evidence overwhelmingly demonstrates that Simulation-Based Learning is more

effective than Traditional Clinical Experience in improving cognitive mastery, psychomotor performance, affective readiness, and clinical judgment. However, SBL and TCE are most beneficial when implemented together, with simulation providing structured foundational practice and TCE offering real-world application.

Phase 7: Interpretation and Reporting

The final phase involved interpreting the synthesized evidence in relation to nursing education practice and policy. Results were summarized in tables and narrative form, emphasizing key trends, methodological strengths, and limitations. The findings were aligned with the PRISMA reporting guidelines, and implications were drawn for educators, administrators, and researchers. The report concludes with recommendations for curriculum development, policy formulation, and future research directions.

Limitations of the Review

This review is limited by variations in simulation fidelity levels and inconsistent measurement tools across included studies. Additionally, most studies employed small sample sizes and short-term assessments. Longitudinal data assessing the sustained impact of SBL on professional competence remain sparse. Publication bias may also be present, as studies with positive outcomes are more likely to be published.

CONCLUSION

This systematic review concludes that Simulation-Based Learning (SBL) is more effective than Traditional Clinical Experience (TCE) in improving nursing competencies across the cognitive, psychomotor, and affective domains. The reviewed studies consistently show that simulation enhances knowledge retention, critical thinking, and clinical reasoning while improving technical skills and procedural accuracy. Learners trained through SBL also demonstrate higher self-efficacy, confidence, and preparedness for real clinical practice compared to those who rely solely on traditional experiences.

The strength of SBL lies in its structured, safe, and feedback-oriented environment, which allows deliberate practice and reflection without risking patient safety. In contrast, TCE provides authentic patient interaction and exposure to the realities of clinical care but is often limited by variability in cases, supervision, and learning opportunities. Integrating both approaches offers the most comprehensive model for nursing education, ensuring theoretical understanding, clinical competence, and emotional readiness.

Overall, the evidence strongly supports Simulation-Based Learning as the superior method for developing competent and confident nurses capable of meeting modern healthcare challenges. Nursing programs are encouraged to institutionalize simulation as a central component of their curricula—supported by faculty training, adequate resources, and policy recognition—to sustain educational quality and bridge the persistent gap between classroom learning and clinical practice.

RECOMMENDATIONS

Based on the findings of this systematic review, the following recommendations are proposed to strengthen nursing education and improve the development of clinical competencies through Simulation-Based Learning (SBL). These are addressed to the key stakeholders who play essential roles in curriculum design, implementation, and policy-making.

1. **For Nurse Educators and Clinical Instructors:** Nurse educators should integrate simulation-based learning as a regular part of instruction to complement traditional clinical practice. They should be trained in simulation facilitation, scenario creation, and structured debriefing to ensure effective learning outcomes. Regular workshops and certification in simulation pedagogy are encouraged to maintain teaching competence and consistency in delivery.
2. **For Curriculum Developers and Academic Administrators:** Curriculum planners and deans of colleges of nursing should embed simulation experiences across all levels of the nursing curriculum. Learning objectives should clearly align with simulation outcomes, ensuring progressive skill development in cognitive, psychomotor, and affective domains. Administrators should also allocate sufficient resources—equipment, laboratory space, and technical support—to sustain simulation programs.
3. **For Nursing Students and Staff Nurses:** Nursing students and practicing nurses are encouraged to actively participate in simulation activities as opportunities for experiential learning and self-assessment. Engaging in structured debriefings and reflective exercises can strengthen clinical judgment, confidence, and teamwork skills that directly enhance patient care.
4. **For Healthcare Institutions and Hospital Partners:** Hospitals and healthcare agencies should collaborate with nursing schools to support simulation-based training as part of staff development and continuing education. Integrating simulation into orientation and competency validation programs can help maintain high standards of clinical performance and patient safety.
5. **For Policy Makers and Accrediting Bodies:** Nursing boards, accrediting agencies, and government authorities should recognize simulation-based education as a valid component of

clinical training. P□ol□icies should specify the acceptable ratio of simulation hours to clinical hours a□nd ensure equitable funding for simulation labo□ratories, especially in public institutions. National guidelines shoul□d also promote standardized simul□ation practic□es based on international benchmark□s such as INACSL st□andards.

6. **For Future Researchers:** Researchers are encouraged to conduct longitudinal and multi-center studies to measure the long-term impact of sim□ulation on clinical competence and patient outcomes□. Studies exp□loring cost-effectiveness, technology adoption, and cultural adaptabili□ty of simul□ation can further strengthen the evidence base and inform national ed□ucation policies.□

This st□udy's recommenda□tions aim to ben□efit nurse educators, curriculum develo□p□ers, nursing students, healthcare institutions, policymakers, and researchers. Implementing these recommendations will help ensure that simulation-b□ased lea□rning becomes a sustainab□le and evidence-based strategy for enhancing nursing competencies, bridging the gap between theory□ and practice, and ultimately improving patient care quality and safety□.

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