

Effect of Simulation-Based and Demonstration-Based Teaching on Students' Confidence

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Abstract

Demonstration-based teaching (DBT) is based on the notion that instructors perform procedures, and students observe them so that they can practice and implement them. Simulation-based Education (SBE) offers realistic clinical scenarios using manikins and standardized patients, allowing practice in a controlled environment that heightens their confidence. To compare the effectiveness of SBE and DBT on nursing students' confidence level score while performing a specific skill, the quasi-experimental post-test design was applied to two non-randomized groups comprising BSN students. A proportional purposive sampling technique was used. A structured questionnaire adapted from Generalized Self-Efficacy Scale was used to measure confidence. The questionnaire consisted of two parts: demographic information and confidence assessment items. Simple descriptive statistics were calculated to compare both groups' mean, median, and standard deviation of confidence level scores. Nursing students taught through SB showed higher confidence than those taught through DBT, with less response variability. This indicates that simulation offers a more consistent experience. Simulation is an interactive technique that promotes greater engagement, transforms into more uniform learning, and improves nursing students' confidence in abdominal health assessment.

Keywords

*Demonstration-based teaching
Nursing students
Simulation-based teaching
Students' confidence*

INTRODUCTION

The psychomotor domain is essential in nursing education due to its impact on patient care and outcomes. Proper instruction in clinical practice increases nursing students' confidence and their ability to deliver safe patient care. Careful methodologies also underpin the more holistic and pan-specialty nursing students to guarantee safe and effective patient care. Many researchers have focused on the need to adequately address the psychomotor domain to strengthen the theory-practice gap to improve patient outcomes (Hobenu et al., 2025). A well-designed clinical training approach ensures that nursing students are adequately prepared to manage real-world patient scenarios, reinforcing the need for an effective teaching methodology (Alrashidi et al., 2023). With the use of manikins, virtual platforms, or standardized patients, simulation-based learning (SBL) simulates clinical scenarios, enabling students to apply theoretical knowledge in a safe and regulated setting (Tolarba, 2021). On the other hand, traditional demonstration methods involve instructor-led physical demonstrations of skills, followed by supervised student practice. Even though both approaches seek to improve nursing competency, there is continuous discussion regarding how well they work to improve knowledge retention, clinical decision-making, critical thinking, and self-confidence (Azizi et al., 2022).

This approach incorporates experiential learning, in which instructors model the skills and offer thorough guidance. This enhances the student's comprehension, aids in the development of useful skills, and boosts their self-esteem. Demonstration-based Teaching (DBT) is commonly used in health care, science, and engineering skills training. Hospital availability, patient conditions, and instructor expertise often constrain this approach. Factors such as increased patient load, limited clinical exposure opportunities, and hospital policies restricting student access to complex procedures present significant challenges (Ramkumar & Sharma, 2020). These limitations hinder students' ability to gain adequate hands-on experience, necessitating alternative approaches to clinical training. Research suggests that while DBT offers foundational skill development, it may not sufficiently prepare students for high-pressure, real-world clinical scenarios where decision-making and hands-on proficiency are crucial (Yuan et al., 2014).

Public-sector nursing institutions in Pakistan face critical challenges, including a shortage of trained faculty and structured clinical training programs (Saeed et al., 2023). Many students receive minimal supervision and are sent directly to hospitals without guided instruction or simulation-based training, leading to an inconsistent and often inadequate learning experience (Mirza et al., 2021). Additionally, due to workforce shortages, nursing students in government institutions are frequently assigned routine hospital duties rather than receiving structured clinical training, further limiting skill development opportunities (Panda et al., 2021). In private-sector nursing colleges, the situation is not significantly

better. Many institutions lack qualified faculty and have limited access to clinical training facilities, restricting students' exposure to essential clinical experiences. The absence of standardized teaching methodologies across institutions creates disparities in clinical competency among nursing graduates (Wei et al., 2024). While some private-sector nursing colleges implement either DBT or Simulation-based Education (SBE), structured comparisons of these methods remain scarce.

To address these challenges, SBE has emerged as a promising alternative to traditional DBT. The simulation-based teaching approach allows educators to create real-world situations and use simulated controlled environments, scenarios, and manikins to enable learners to experiment, practice, and learn in a controlled environment. The high-fidelity mannequins, standardized patients, and virtual reality replicate real-world clinical scenarios. This approach allows students to practice clinical skills before interacting with actual patients, enhancing their confidence (Labrague et al., 2019). This approach engages learners with real scenarios, allowing them to interact and learn, and to experiment without harming the patient. The learners use critical thinking that enhances engagement and improves retention. This is commonly used in health care, aviation, and business worker training. Several international studies suggest that SBE improves clinical judgment, reduces anxiety, and enhances skill acquisition more effectively than traditional teaching methods. SBE is also associated with improved knowledge retention, critical thinking skills, and emergency preparedness, often inadequately addressed in DBT (Foronda et al., 2020). However, the effectiveness of SBE in comparison to DBT within the Pakistani context remains underexplored, making it necessary to investigate its impact on clinical skill development among nursing students.

Despite the rapid growth of private nursing institutions in Pakistan, many lack dedicated clinical training facilities and rely heavily on government hospitals for clinical placements. The government hospital has staff shortage, and uses students as workforce to address the shortage issue (Mirza et al., 2021). This disparity in training environments leads to inconsistent clinical exposure among students, impacting their confidence and readiness for practice. Furthermore, researchers observe that most nursing institutions still assess students primarily through Multiple-Choice Questions (MCQs) rather than using structured clinical assessments such as Objective Structured Clinical Examinations (OSCEs) and Objective Structured Practical Examinations (OSPEs). The absence of rigorous skill assessments raises concerns regarding nursing graduates' preparedness and ability to perform clinical procedures effectively. Evidence suggests that integrating OSCEs and OSPEs with simulation-based training improves skill mastery and confidence, reinforcing the need for more robust assessment strategies. This means that if we do not include the OSCE and OSPE exams in their assessment, they will not focus to learn the skills. They prepare for MCQs only. Most nursing instruction has a shortage of resources and advanced training equipment.

Study Problem

Given these challenges, it is critical to evaluate alternative teaching methodologies to determine which approach, SBE or DBT, better enhances students' confidence in clinical skills. While global research supports SBE's effectiveness in skill acquisition, its comparative impact within Pakistan's nursing education system remains unexplored. This study aims to address this gap by empirically assessing the efficacy of SBE versus DBT in preparing nursing students for clinical practice. Additionally, examining students' competence, confidence, and clinical performance under both methodologies provides concrete evidence for educators and policymakers on the most effective approach to skill-based nursing education in Pakistan.

Objective of the Study

- To compare the effectiveness of Simulation-Based and DBT on nursing students' confidence level score while performing a specific skill.

LITERATURE REVIEW

Context and Theoretical Foundations

The constructivist learning theory emphasizes active learning, where students build knowledge through hands-on experiences rather than passive observation (Vygotsky, 1978). SBE aligns with this model, immersing students in realistic patient scenarios that require critical thinking, problem-solving, and direct engagement. In contrast, DBT relies more on observational learning, where students watch instructors perform skills before practicing under supervision. Studies suggest active learning results in better skill retention and confidence than observational learning (Chen et al., 2021). Similarly, the Self-Efficacy Theory of Bandura (1977) states that confidence in performing tasks is built through mastery experiences, vicarious learning, verbal persuasion, and physiological feedback. SBE enhances self-efficacy by allowing students to practice skills repeatedly, receive immediate instructor feedback, and gain reassurance through controlled success experiences (Chen et al., 2021). In contrast, DBT lacks structured reinforcement, making it less effective in boosting students' confidence.

Importance of Clinical Skills Training in Nursing Education

Clinical skills training is fundamental to nursing education, ensuring students develop the necessary competence and confidence to deliver safe and effective patient care. Confidence in clinical skills directly influences students' ability to make decisions, handle high-pressure situations, and provide quality nursing care (Kim et al., 2016). Traditionally, DBT has been the primary method for training nursing students, where instructors demonstrate procedures and students observe them before attempting to replicate them under supervision. However, DBT has been criticized for lacking immediate feedback, limited hands-on exposure, and inconsistent practice opportunities, which can hinder students' skill acquisition and confidence development (Ramkumar & Sharma, 2020). With the increasing complexity of healthcare environments, there is a growing need for innovative teaching methodologies that enhance students' readiness for clinical practice (Chen et al., 2021). SBE has emerged as an alternative approach, offering controlled, risk-free environments where students can repeatedly practice clinical procedures, receive real-time feedback, and develop confidence before engaging with actual patients (Labrague et al., 2019). However, despite its recognized benefits, the comparative effectiveness of SBE versus DBT in Pakistan remains unexplored, necessitating further research into how these methods impact students' clinical competence and confidence.

Need for Evaluating Teaching Methods

The variability in teaching methodologies across nursing institutions calls for evaluating which method, SBE or DBT, is more effective in enhancing clinical confidence. DBT provides real-world exposure but is constrained by limited hospital resources, patient safety concerns, and inconsistent student experiences (Rosen et al., 2012). On the other hand, SBE offers a structured, standardized approach to skill development, enabling students to engage in realistic patient care scenarios within a controlled environment (Kyaw et al., 2019). Recent research suggests that SBE-trained students exhibit greater clinical competence and lower anxiety when handling complex procedures (Alrashidi et al., 2023). However, the lack of structured simulation facilities in many Pakistani nursing institutions has led to an overreliance on DBT, raising concerns about whether students are adequately prepared for real-world practice (Mirza et al., 2021). Therefore, comparing these teaching methods in the Pakistani context is crucial for determining the best approach for enhancing clinical skill development and confidence among nursing students.

Emergence of SBE and DBT

Globally, healthcare education has shifted toward simulation-based training to bridge the gap between theoretical knowledge and practical application (Foronda et al., 2020). While DBT has been widely used, SBE is increasingly preferred for its ability to offer standardized, repeated practice, real-time feedback, and controlled exposure to diverse clinical scenarios. However, many nursing institutions in Pakistan still rely on DBT due to a lack of resources for implementing simulation-based training, raising concerns about students' readiness for professional practice (Mirza et al., 2021).

Simulation vs Demonstration-Based Teaching

SBE and Clinical Confidence

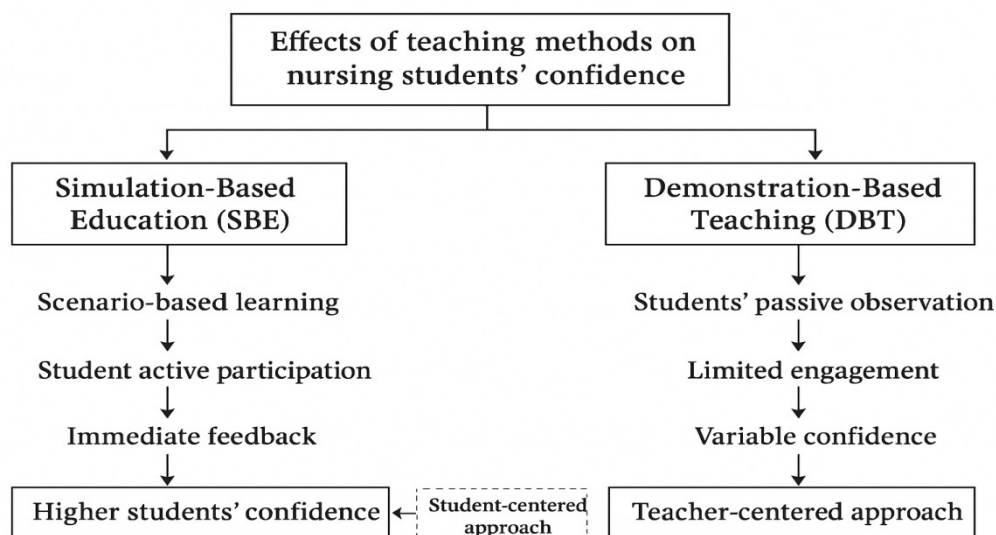
Studies have demonstrated that SBE significantly improves clinical confidence and competence. A meta-analysis by Kyaw et al. (2019) found that high-fidelity simulations enhance skill retention, reduce anxiety, and improve clinical decision-making. Similarly, a randomized controlled trial (RCT) by Chen et al. (2021) concluded that SBE-trained students outperformed DBT-trained students in OSCEs and emergency procedures.

DBT and Its Limitations

While DBT is effective in introducing foundational skills, it has limitations. Mehdipour-Rabori et al. (2021) found that DBT-trained students reported higher anxiety and lower preparedness in real clinical settings. Additionally, Siddiqui et al. (2023) highlighted that DBT is highly dependent on instructor expertise, leading to inconsistent learning experiences across institutions.

Comparative Studies on SBE and DBT

Research comparing SBE and DBT consistently favours SBE. Alrashidi et al. (2023) found that SBE-trained students demonstrated superior clinical performance and higher confidence levels than DBT-trained students. However, Pakistan lacks large-scale studies comparing these methods, particularly in private nursing institutions (Mirza et al., 2021). SBE is more effective than DBT in improving clinical confidence and decision-making abilities (Kim et al., 2016). DBT provides real-patient interaction but lacks consistent exposure to diverse clinical cases (Siddiqui et al., 2023). Pakistan's private nursing institutions lack structured clinical training, simulation labs, and OSCE-based assessments, leading to inconsistencies in skill development. Lack of comparative research in Pakistan. Most studies focus on student satisfaction rather than empirical comparisons of confidence levels (Mirza et al., 2021). Inconsistent training models across nursing institutions necessitate research on which method better prepares students for clinical practice (Saeed et al., 2023). This literature review highlights SBE as a superior method for improving clinical competence and confidence. However, given the limited research in Pakistan, empirical studies are urgently needed to compare SBE and DBT in private nursing institutions. This study aims to bridge this knowledge gap and contribute to evidence-based nursing education reforms in Pakistan.



Hypothesis

H₁: Simulation-Based teaching significantly improves students' confidence level scores compared to Demonstration-Based Teaching.

METHODOLOGY

This study employs a quasi-experimental post design, using an approach with two non-randomized groups of nursing students learn skills from different teaching strategies. One group underwent simulation-based training, while the other received instruction through a DBT strategy. This comparative study measures confidence after the intervention. A confidence level score after exposure to either teaching method was measured. The comparative nature of the study provided empirical evidence on the effectiveness of SBE versus DBT in Pakistani nursing education, where simulation-based training remains underutilized due to resource constraints (Mirza et al., 2021). The study was conducted at a private nursing college with a lab that uses either SBE or DBT as its primary clinical teaching methodology. The target population included undergraduate nursing students in the third and fourth years of the Bachelor of Science in Nursing (BSN) program. The students were studying in the fifth and seventh semesters, and both groups were assessed through a checklist prepared for abdomen assessment.

Inclusion Criteria

The students currently enrolled in the BSN program, studying in the fifth and seventh semesters were selected. All of the students, on the other hand, with the following characteristics were excluded:

- Have prior clinical work experience outside their academic training, which may influence confidence levels.
- Unwilling to participate in the study or not provide informed consent.

Sampling Technique

A non-random, convenient proportionate sampling strategy was used to select students who met the inclusion criteria.

- Previous studies in similar contexts suggest a minimum of 46 students. OpenEpi.com was used to estimate the total sample size.
- SBE Group: 25 students
- DBT Group: 25 students

Data Collection Methods

A structured questionnaire adapted from Generalized Self-Efficacy Scale by Schwarzer and Jerusalem (1995) to measure confidence in clinical nursing skills. The demographic data was added to the adapted questionnaire. The questionnaire consisted of two parts: Part A. Demographic Information, Part B Confidence Assessment (17 Items) with a 5-point Likert scale.

Data Analysis

Statistical analysis was conducted using Statistical Package for the Social Sciences (SPSS). Simple descriptive statistics were employed to calculate the mean, median, standard deviation, and average of the confidence score in both groups, and a t-test was applied to determine the difference between the groups.

Ethical Considerations

The study was part of a short academic writing course. The American Educational Research Association (AERA) specifically includes informed consent, confidentiality, minimizing harm, and respecting participants. Written informed consent was added to the Google Form for all participants. Participants were assured of privacy and anonymity. The data were securely stored in a password-protected database, and physical records will be kept under lock and key. Students had the right to withdraw at any stage without any penalties. The study adhered to international ethical guidelines for research involving human participants. No harm or discomfort is expected, as SBE and DBT are standard teaching methodologies.

RESULTS & FINDINGS

All the participants in the study were male nursing students who constituted a sample of 50, 25 students in the simulation-based teaching group and 25 in the DBT group. The selected students responded to the survey, giving a response rate of 100%. Most were in the 5th semester (92.2%) and the least in the seventh semester (7.8%). Around 68.6% of students revealed previous experience, whereas 31.4% were not exposed to prior knowledge. This homogeneity of gender and semester level, combined with total participation, lends reliability and consistency to the demographic profile covered in the study.

The findings demonstrate that simulation-based instructions are more effective than demonstration-based techniques for building student confidence. Students in the simulation group reported higher confidence scores on average than those engaged in demonstration-based instruction. They demonstrated a smaller range of variability in their responses, implying a more uniformly good experience among participants. The results support that SBT is more interactive, involves experiential learning, and engages students in ways that improve self-efficacy. In contrast, demonstration-based teaching, being passive, creates more variability and less consistently positive effects on learner confidence.

Table 1

Descriptive Statistics

Teaching Method	N	Mean	Median	Standard Deviation	Range (Min- Max)
Demonstration	25	3.29	3.20	.44	2.51- 4.12
Simulation	25	3.86	3.85	.30	3.31-4.46

The simulation group scored higher in confidence, with a mean of 3.86 and a standard deviation 0.30, versus the demonstration groups, whose mean was recorded at 3.29 and standard deviation at 0.44. The median confidence score from the simulation group was 3.85, whereas the median for the demonstration group was 3.20; therefore, the results indicate that nursing students who received simulation-based teaching have a slightly higher mean confidence score than those who received demonstration-based teaching. The descriptive nature of these findings suggests a simulation as a more effective technique for instilling confidence in the learner population. The research examined and compared the impact of simulation-based and DBT strategies on students' self-reported confidence levels. Descriptive statistics were computed for each group to assess some measure of central tendency and variability.

Table 2

T-test to Compare the Variables

Teaching Method	N	Mean	SD	t	df	p
Demonstration	25	3.29	0.44	5.04	48	<0.001
Simulation	25	3.86	0.30			

The T-test was used to calculate the difference, which was statistically significant (Table 2). The t-test result shows a significant difference in score between the two groups, as $t(48) = 5.04$ and $p < 0.001$ in the simulation and demonstration groups. The findings of the t-tests support the hypothesis that SBE is more effective and may be adapted to teach nursing students. This improves the nursing students' confidence more as compared to demonstration-based teaching. The small standard deviation and t-test results in the SME group indicate that small changes and variations in the confidence level show that this simulation method of education is more effective and provides a better learning experience to the students. The results of the current study corroborate earlier studies showing that this teaching method offers a realistic practice environment, and students actively participate and receive prompt responses from the teacher. They can learn skills through experiential learning. This SBE approach is more engaging than DBT and improves students' self-confidence. The integration of SBE in the curriculum will ensure higher confidence among nursing students. This will improve patient care and safety.

Discussion

The present study has focused on comparing simulation-based and DBT for the self-confidence of

nursing students. The results from a survey indicated that students taught via a simulation-based method scored higher in self-confidence than those taught in a traditionally demonstrated way. The above report also finds echoes with earlier studies across diverse educational contexts, emphasizing the gains of simulation in nursing education. Simulation-based teaching has always been promising in positively affecting self-confidence and clinical judgment in nursing students. A comparative study by Alamrani et al. (2018) found that students exposed to simulation education reported greater critical thinking and self-confidence development than those taught by traditional methods. The researchers indicated that those findings resulted from the advantage of simulation, which allowed the students to be engaged in realistic clinical situations, thereby improving their decision-making and reinforcing competence.

The study conducted by Pinar et al. (2016) examined the effects of video-based simulation on student confidence. They concluded that simulation-based teaching significantly improves the knowledge and self-reported confidence. The use of a simulation-based tool promotes learner engagement and deeper understanding. The students repeatedly apply knowledge in a controlled environment and immerse themselves in challenging situations, improving self-confidence. Another study conducted by Yu et al. (2020) in South Korea has confirmed that simulation-based teaching positively impacts self-confidence in interprofessional students, and they work more collaboratively. The participation of interprofessional students and scenario-based teaching improves their communication, teamwork, and confidence. This improves their self-efficacy. Although DBT is widely used and a more accepted approach for clinical education in Pakistan, it has shown comparatively low outcomes in enhancing the self-confidence level of students. The study conducted by Siddiqui et al. (2023) in Pakistan reported that DBT is widely used in Pakistan for clinical procedures teaching without proper evidence of effectiveness in building students' confidence and self-efficacy in complex clinical scenarios.

Azizi et al. (2022) conducted a quasi-experimental study comparing simulation and traditional teaching in Iran. They found that students in the simulation group scored significantly higher in both self-efficacy and clinical performance. This highlights the consistent international trend favouring simulation for developing core professional competencies in nursing. The effectiveness of simulation may be attributed to several pedagogical factors, including active learning, immediate feedback, and opportunities for repetition and reflection. Blackmore et al. (2018) emphasized that simulation enhances communication skills, particularly in sensitive situations such as reporting medication errors. The ability to rehearse clinical tasks and interpersonal communication in a safe environment directly impacts students' confidence in real-life practice. The findings underscore the growing body of evidence supporting simulation as a better teaching approach in nursing education, particularly when the goal is to enhance students' confidence and readiness for clinical practice. While DBT may still be useful for procedural skills, simulation provides a more holistic and confidence-building educational experience.

CONCLUSION

Students' self-reported confidence levels were compared between the simulation-based and DBT approaches. Additionally, the descriptive analysis demonstrated that SBT significantly increased confidence compared to DBT. These findings support simulation's potential as a very effective teaching tool due to its highly engaging effect on learners' confidence. It also maximizes learning effectiveness and grasp through interactive, hands-on experiences. Simulation-Based Teaching engages the students and helps them build confidence as learners. This approach is more interactive, providing hands-on experiences and the students gain more knowledge and learn effectively.

Recommendations

Based on the findings of this study, it is recommended that educational institutions formally incorporate simulation-based methodologies into their instructional framework, particularly in disciplines where learner confidence is strong for them to succeed in the clinical area. Institutions should conduct training workshops and ongoing professional development to equip educators with the skills necessary

to continue developing, implementing, and evaluating simulation-based learning initiatives. They must teach skills and conduct Objective Structured Clinical Exam (OSCE) in their assessment system. To encourage immersive experiences, educational institutions and training facilities should invest in creating or acquiring simulation environments, including digital tools, virtual labs, manikins, and realistic practice modules. Basic concepts can be taught effectively through the DBT, but this approach should be viewed as an addition rather than the primary method of instruction. Simulations should be carried out following the demonstrations to allow students to apply and solidify their understanding.

Competing Interest

The authors declare no conflict of interest.

Authors' Biography

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