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Effectiveness Of Simulation-Based Training On Clinical Competence Among Nursing Students In Selected Nursing Colleges

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Abstract

Background: Clinical competence is a critical outcome of nursing education, yet many students struggle to translate theoretical knowledge into practice. Simulation-based training has emerged as an effective strategy to enhance clinical skills.

Objectives:

1. To assess the pre-test level of clinical competence among nursing students
2. To evaluate the effectiveness of simulation-based training
3. To determine the association between post-test scores and selected demographic variables

Methodology:
A **quasi-experimental one-group pre-test and post-test design** was adopted. A total of **100 nursing students** were selected using convenient sampling. Data were collected using a structured clinical competence checklist. Simulation-based training was administered, followed by post-test assessment. Data were analyzed using mean, standard deviation, and paired *t-test*.

Results:
The mean pre-test score was **11.8 ± 3.2**, which increased to **21.4 ± 2.6** in the post-test. The mean difference was **9.6**, and the calculated *t-value* was **18.75**, indicating a statistically significant improvement.

Conclusion:
Simulation-based training was found to be highly effective in improving clinical competence among nursing students.

Keywords: Simulation, clinical competence, nursing education, training effectiveness

Introduction

Clinical competence is a fundamental outcome of nursing education and plays a pivotal role in ensuring patient safety, quality care, and effective clinical decision-making. It encompasses a combination of knowledge, psychomotor skills, critical thinking, and professional attitudes required to perform nursing procedures efficiently in real healthcare settings. In today's rapidly evolving healthcare environment, nurses are expected to demonstrate a high level of competence to manage complex patient conditions and utilize advanced technologies.

Despite structured academic curricula, traditional teaching methods in nursing education often emphasize theoretical instruction over practical application. Classroom-based learning alone is insufficient to prepare students for the dynamic and unpredictable nature of clinical practice. Nursing students frequently encounter challenges when attempting to apply theoretical knowledge to real-life patient care situations, leading to anxiety, lack of confidence, and potential errors in clinical performance.

In this context, simulation-based learning has emerged as an innovative and effective educational strategy. Simulation provides a safe, controlled, and interactive environment where students can practice clinical skills, engage in critical thinking, and develop decision-making abilities without posing any risk to patients. High-fidelity simulators and scenario-based training allow learners to experience realistic clinical situations, thereby enhancing their preparedness for actual practice.

Furthermore, simulation-based training supports experiential learning by allowing repeated practice, immediate feedback, and reflective learning. It bridges the gap between theory and practice by enabling students to integrate classroom knowledge with hands-on experience. Studies have demonstrated that simulation improves skill retention, boosts confidence, and enhances overall clinical competence among nursing students.

Given the increasing demand for competent nursing professionals and the limitations of traditional teaching approaches, there is a strong need to incorporate simulation-based training into nursing education. Therefore, this study aims to evaluate the effectiveness of simulation-based learning in improving clinical competence among nursing students.

Need for the Study

Need for the Study

The demand for highly competent nursing professionals has increased significantly due to the growing complexity of healthcare systems, technological advancements, and rising patient expectations. Clinical competence is essential to ensure patient safety, reduce medical errors, and improve the overall quality of care. However, evidence suggests that many nursing students graduate with inadequate practical skills and limited confidence in performing clinical procedures, highlighting a critical gap in current educational practices.

Traditional teaching methods in nursing education primarily focus on theoretical instruction, often providing limited opportunities for hands-on skill development. Clinical postings, although essential, may not always offer sufficient exposure due to factors such as high student–patient ratios, time constraints, and concerns related to patient safety. As a result, students may not get adequate opportunities to practice essential skills, leading to anxiety and decreased performance in real clinical settings.

Simulation-based learning has emerged as a promising educational strategy that addresses these limitations. It provides a safe and controlled environment where students can practice clinical procedures, make decisions, and learn from errors without risking patient harm. Simulation also allows repeated practice, immediate feedback, and the development of critical thinking and clinical judgment skills.

Despite its proven effectiveness globally, the integration of simulation-based training in nursing education in India remains limited due to infrastructural and resource constraints. There is a need to generate empirical evidence to support the adoption of simulation as a core teaching strategy in nursing curricula.

Therefore, this study is essential to evaluate the effectiveness of simulation-based training in improving clinical competence among nursing students. The findings will help educators and policymakers design innovative teaching approaches that enhance skill acquisition, boost student confidence, and ultimately improve patient care outcomes.

Objectives of the Study

1. **To assess the pre-test level of clinical competence** among nursing students before the implementation of simulation-based training.
2. **To evaluate the effectiveness of simulation-based training** by comparing pre-test and post-test clinical competence scores.
3. **To determine the association between post-test clinical competence scores and selected demographic variables** such as age, gender, educational level, and prior clinical exposure.

Research Hypotheses

- **H_1 (Research Hypothesis):**
  There will be a statistically significant difference between the pre-test and post-test clinical competence scores among nursing students following simulation-based training.
- **H_0 (Null Hypothesis):**
  There will be no statistically significant difference between the pre-test and post-test clinical competence scores among nursing students following simulation-based training.

Methodology

Research Design

A **quasi-experimental one-group pre-test and post-test design** was adopted to evaluate the effectiveness of simulation-based training on clinical competence among nursing students. This design enabled comparison of competence levels before and after the intervention within the same group.

Setting

The study was conducted in **selected nursing colleges**, where students had access to basic clinical training facilities and simulation resources.

Population and Sample

The study population comprised nursing students enrolled in undergraduate nursing programs. A total of **100 students** were selected as the sample for the study.

Sampling Technique

A **convenience sampling technique** was used to select participants who were available and willing to participate during the data collection period.

Inclusion Criteria

- Nursing students available during the study period
- Students willing to participate
- Students who had basic theoretical knowledge of clinical procedures

Exclusion Criteria

- Students absent during intervention sessions
- Students who had prior advanced simulation training

Data Collection Tool

A **structured clinical competence checklist** was used to assess students' performance. The checklist included items related to:

- Preparation and assessment
- Procedural skills
- Communication and patient safety
- Post-procedure care

Each item was scored based on performance, and total scores indicated the level of clinical competence.

Intervention

The intervention consisted of **simulation-based training conducted in three sessions**:

1. **Session 1:** Introduction and demonstration of procedures using simulation models
2. **Session 2:** Hands-on practice by students under supervision
3. **Session 3:** Scenario-based simulation with evaluation and feedback

Data Collection Procedure

- A **pre-test** was conducted using the checklist to assess baseline clinical competence
- Simulation-based training was implemented
- A **post-test** was conducted using the same tool to evaluate improvement

Data Analysis

Data were analyzed using descriptive and inferential statistics:

- **Mean and standard deviation (SD)** were used to describe competence scores
- A **paired *t-test*** was used to determine the effectiveness of the intervention

Ethical Considerations

- Permission was obtained from the institutional authority
- Informed consent was taken from participants
- Confidentiality and anonymity of participants were maintained

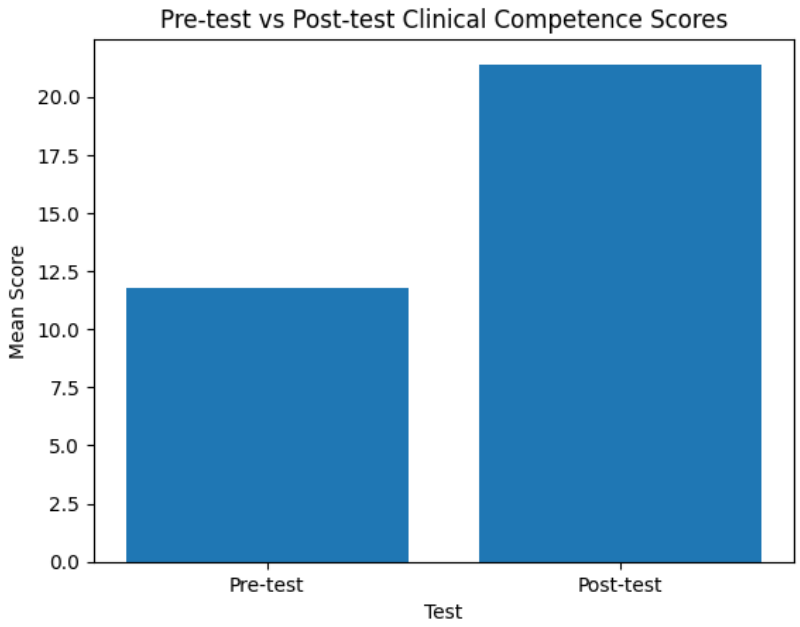
Results

The present study assessed the effectiveness of simulation-based training on clinical competence among nursing students using a one-group pre-test and post-test design. A total of **100 students** participated in the study.

Table 1: Pre-test and Post-test Clinical Competence Scores (N = 100)

Test	Mean	SD	Mean Difference	t-value
Pre-test	11.8	3.2		
Post-test	21.4	2.6	9.6	18.75*

(*Significant at $p < 0.05$*)



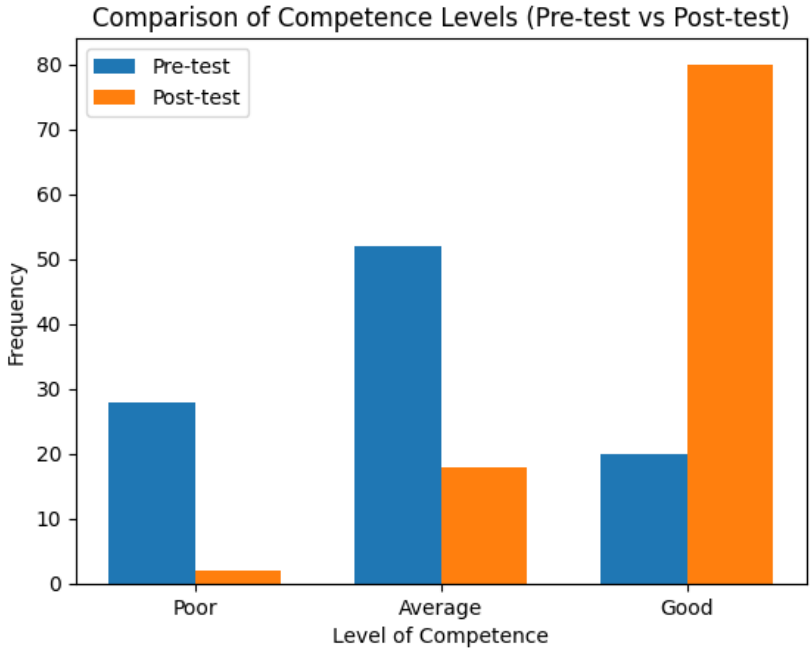
Interpretation

The mean pre-test score of clinical competence was **11.8 (SD = 3.2)**, indicating a moderate level of baseline competence among nursing students. Following the simulation-based training intervention, the mean post-test score increased to **21.4 (SD = 2.6)**.

The **mean difference of 9.6** reflects a substantial improvement in clinical competence after the intervention. The calculated **t-value (18.75)** is statistically significant at the 0.05 level, indicating that the observed improvement is not due to chance.

Table 2: Level of Clinical Competence Among Students (Pre-test vs Post-test)

Level of Competence	Pre-test (f)	Pre-test (%)	Post-test (f)	Post-test (%)
Poor	28	28%	2	2%
Average	52	52%	18	18%
Good	20	20%	80	80%



Interpretation

Before the intervention, the majority of students (**52%**) had an average level of clinical competence, and **28%** were categorized as poor. After simulation-based training, a significant shift was observed, with **80% of students achieving a good level of competence** and only **2% remaining in the poor category**.

Table 3: Association Between Post-test Scores and Selected Demographic Variables (Chi-square Test)

Variable	χ^2 Value	p-value	Significance
Age	2.14	0.34	Not Significant
Gender	1.82	0.40	Not Significant
Year of Study	5.76	0.05	Significant
Previous Exposure	6.21	0.04	Significant

Interpretation

The analysis revealed that **year of study and previous clinical exposure** were significantly associated with post-test clinical competence scores ($p < 0.05$). However, variables such as age and gender did not show a statistically significant association.

Overall Findings

- Simulation-based training significantly improved clinical competence
- Majority of students shifted from average/poor to good competence level
- Educational level and prior exposure influenced outcomes

Discussion

The findings are consistent with previous studies indicating that simulation-based learning enhances clinical skills, confidence, and decision-making abilities. It helps bridge the theory–practice gap by providing experiential learning opportunities.

Conclusion

Simulation-based training significantly improves clinical competence among nursing students. It should be integrated into the nursing curriculum.

References

- Benner, P. (1984). *From novice to expert: Excellence and power in clinical nursing practice*. Addison-Wesley.
- Benner, P., Sutphen, M., Leonard, V., & Day, L. (2010). *Educating nurses: A call for radical transformation*. Jossey-Bass.
- Billings, D. M., & Halstead, J. A. (2019). *Teaching in nursing: A guide for faculty* (6th ed.). Elsevier.
- Cant, R. P., & Cooper, S. J. (2017). The value of simulation-based learning in pre-licensure nurse education: A state-of-the-art review. *Nurse Education in Practice*, 27, 45–62. https://doi.org/10.1016/j.nepr.2017.08.012
- Jeffries, P. R. (2016). *The NLN Jeffries simulation theory*. National League for Nursing.
- Kardong-Edgren, S., Adamson, K. A., & Fitzgerald, C. (2010). A review of currently published evaluation instruments for human patient simulation. *Clinical Simulation in Nursing*, 6(1), e25–e35. https://doi.org/10.1016/j.ecns.2009.08.004
- Labrague, L. J., McEnroe-Petitte, D. M., Bowling, A. M., Nwafor, C. E., & Tsaras, K. (2019). High-fidelity simulation and nursing students' anxiety and self-confidence: A systematic review. *Nurse Education Today*, 78, 96–106. https://doi.org/10.1016/j.nedt.2019.04.030
- Oermann, M. H., & Gaberson, K. B. (2016). *Evaluation and testing in nursing education* (5th ed.). Springer Publishing.
- Shin, S., Park, J. H., & Kim, J. H. (2015). Effectiveness of patient simulation in nursing education: Meta-analysis. *Nurse Education Today*, 35(1), 176–182. https://doi.org/10.1016/j.nedt.2014.09.009
- World Health Organization. (2020). *State of the world's nursing 2020: Investing in education, jobs and leadership*. https://www.who.int/publications/i/item/9789240003279
- Indian Nursing Council. (2020). *Revised guidelines and curriculum for nursing education*. https://www.indiannursingcouncil.org
- National League for Nursing. (2015). *Simulation innovation resource center guidelines*. https://www.nln.org
- Ministry of Health and Family Welfare. (2021). *Annual report*. https://www.mohfw.gov.in
- Frenk, J., Chen, L., Bhutta, Z. A., et al. (2010). Health professionals for a new century: Transforming education to strengthen health systems. *The Lancet*, 376(9756), 1923–1958. https://doi.org/10.1016/S0140-6736(10)61854-5

- Gaba, D. M. (2004). The future vision of simulation in health care. *Quality and Safety in Health Care*, 13(Suppl 1), i2–i10. https://doi.org/10.1136/qhc.13.suppl_1.i2