

Effectiveness of a Simulation-Based Teaching Programme on Knowledge and Skill regarding Postoperative Pain Management among Nursing Students

Daleep Kumar¹, Gurpreet Kaur², Thangam Sheela³, Ravi Kumar⁴, Amita Joseph⁵

¹Vice-Principal, Pushpanjali College of Nursing, Agra

²Principal cum Professor, Sukhjinder Novel Institute of Nursing, Dunera, Pathankot

³Principal/ Dean, TSM University, Lucknow

⁴M.Sc. Nursing (CTVS), Government College of Nursing, BRD Medical College Campus, Gorakhpur, Uttar Pradesh

⁵Professor, Sri Aurobindo Institute of Medical College and P.G. Institute College of Nursing, Indore

Corresponding author : Daleep Kumar, Vice-Principal, Pushpanjali College of Nursing, Agra

Corresponding E-mail : daleepprajapati@gmail.com

Abstract

Introduction : Postoperative pain is one of the most common challenges in surgical patients, and its effective management is a crucial nursing responsibility. Evidence suggests that nursing students often lack adequate knowledge and skill in pain management¹. Simulation-based teaching has emerged as an innovative strategy to bridge this gap².

Methodology : A pre-experimental one-group pre-test-post-test design was adopted. The study included 60 B.Sc. Nursing final-year students selected by purposive sampling. Structured knowledge questionnaires and observational skill checklists were used as tools³. A structured simulation-based teaching programme was implemented, and post-test knowledge and skill levels were assessed after one week. Data were analyzed using descriptive and inferential statistics⁴.

Results : The mean pre-test knowledge score was 12.45 ± 3.21 , which increased significantly to 22.76 ± 2.89 in the post-test ($p < 0.001$). Similarly, the mean skill score improved from 10.12 ± 2.54 to 18.35 ± 2.17 ($p < 0.001$). The hypothesis stating a significant difference between pre- and post-test knowledge and skill was accepted.

Conclusions : Simulation-based teaching is highly effective in improving both knowledge and skill regarding postoperative pain management among nursing students⁵,⁶. Incorporating simulation into nursing curricula can enhance clinical competence and patient care outcomes.

Keywords : Simulation, Postoperative pain, Pain management, Nursing students, Teaching programme

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Introduction

Pain is considered the "fifth vital sign" and an essential parameter in clinical nursing practice. Effective postoperative pain management promotes recovery, reduces complications, and improves patient comfort and satisfaction². Despite advances in pharmacological and non-pharmacological strategies, studies show that postoperative pain remains under-assessed and undertreated¹.

²Nurses are at the frontline of surgical patient care, and their role in pain assessment and management is indispensable. However, undergraduate nursing students often lack adequate knowledge and skill in this area, largely due to insufficient clinical exposure and lack of evidence-based training³.

³Traditional lecture-based methods provide theoretical information but fail to prepare students for decision-making in real-life clinical settings. Simulation-based teaching offers a safe, interactive, and student-centered approach that integrates theory into practice⁴.

⁴Simulation provides opportunities to practice pain assessment, safe medication administration, communication, and non-pharmacological interventions without compromising patient safety¹. It also enhances critical thinking, psychomotor abilities, confidence, and clinical judgment among students^{2, 11}.

⁵Although international studies have shown positive outcomes of simulation-based teaching in various nursing domains^{3, 2}, there is limited evidence in the Indian context specifically related to postoperative pain management. This study was therefore undertaken to evaluate the effectiveness of a simulation-based teaching programme on knowledge and skill regarding postoperative pain management among nursing students.

Objectives

1. To assess the pre-test knowledge and skill of nursing students regarding postoperative pain management.
2. To evaluate the post-test knowledge and skill of nursing students after administering the simulation-based teaching programme.
3. To compare the pre-test and post-test knowledge and skill scores.
4. To determine the effectiveness of a simulation-based teaching programme regarding postoperative pain management.

Hypothesis

- v **H₀**: There is no significant difference in the pre-test and post-test knowledge and skill scores of nursing students regarding postoperative pain management.
- v **H₁**: There is a significant difference in the pre-test and post-test knowledge and skill scores of nursing students regarding postoperative pain management.

Materials and Methods

Research Design : Pre-experimental one-group pre-test-post-test design.

Setting : The study was conducted at Pushpanjali college of Nursing Agra.

Population : Final-year B.Sc. Nursing students.

Sample Size : 60 students.

Sampling Technique : Purposive sampling.

Inclusion Criteria :

- v Students studying in final-year B.Sc. Nursing.
- v Willing to participate in the study.

Exclusion Criteria :

- v Students who had undergone prior formal training in simulation-based pain management.

Tool :

1. Structured Knowledge Questionnaire - to assess knowledge regarding postoperative pain management (30 multiple-choice questions).
2. Observational Skill Checklist - to assess practical skills (20 items covering pain assessment, documentation, non-pharmacological measures, communication, and safe administration of analgesics).

Procedure :

- v Pre-test knowledge and skill assessment were conducted using the above tools.
- v Simulation-based teaching programme was administered, including lectures, demonstrations, role play, and hands-on practice in a simulated clinical setting.
- v After one week, a post-test was conducted using the same tools.

Data Analysis : Data were analyzed using SPSS. Descriptive statistics (mean, SD, frequency, percentage) and inferential statistics (paired t-test) were applied.

Results

Table 1: Pre-test and Post-test Knowledge Scores of Nursing Students (n=60)

Test	Mean $\pm$ SD	Mean Difference	t-value	p-value
Pre-test	12.45 $\pm$ 3.21	-	-	-
Post-test	22.76 $\pm$ 2.89	10.31	14.82	<0.001

Interpretation : The mean post-test knowledge score was significantly higher than the pre-test score ($p < 0.001$).

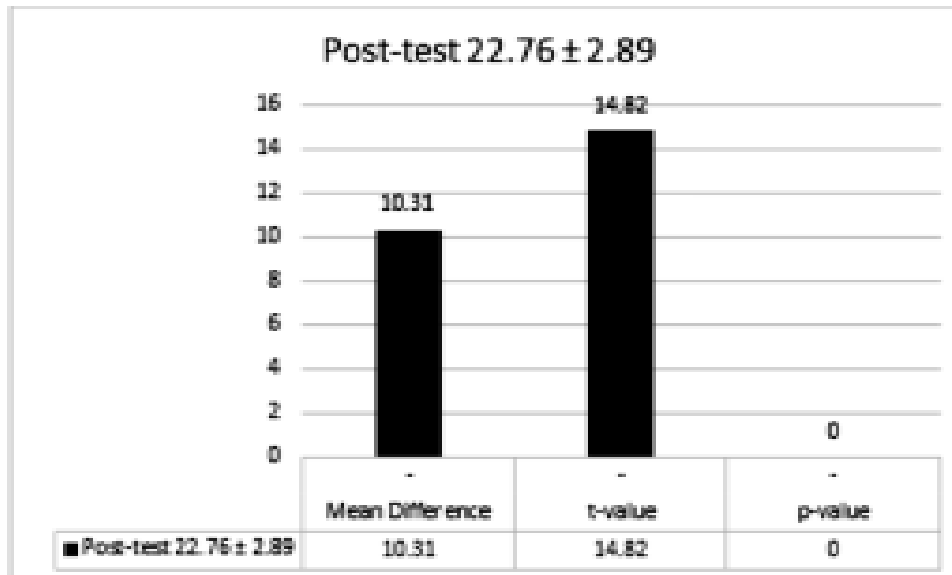


Figure 01: Pre-test and Post-test Knowledge Scores of Nursing Students (n=60)

Table 2: Pre-test and Post-test Skill Scores of Nursing Students (n=60)

Test	Mean $\pm$ SD	Mean Difference	t-value	p-value
Pre-test	10.12 $\pm$ 2.54	-	-	-
Post-test	18.35 $\pm$ 2.17	8.23	12.64	<0.001

Interpretation : The mean post-test skill score was significantly higher than the pre-test score ($p < 0.001$).

Discussion

The findings clearly indicate that simulation-based teaching significantly improved both knowledge and skill regarding postoperative pain management among nursing students. These results are consistent with previous studies conducted globally, which reported that simulation enhances critical thinking, clinical competence, and confidence among nursing students. The improvement observed in this study emphasizes the need to integrate simulation as a regular teaching strategy in nursing curricula to ensure students are better prepared for clinical challenges.

Conclusions

Simulation-based teaching was highly effective in improving

knowledge and skill among nursing students regarding postoperative pain management. Nursing educators should incorporate simulation-based approaches into teaching-learning strategies to enhance clinical competence and improve patient outcomes.

Recommendations

1. Incorporation of simulation-based teaching into the undergraduate nursing curriculum.
2. Periodic workshops and training sessions on pain management for students and staff nurses.
3. Replication of the study with a larger sample size and in multiple institutions.

4. Comparative studies with other teaching methods (lecture, demonstration) to evaluate relative effectiveness.

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