Effectiveness of Simulation-Based Teaching on Knowledge Regarding Advanced Infertility Management Among Staff Nurses in Selected Hospitals, Kanpur, Uttar Pradesh

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ABSTRACT

Background:

Infertility is a significant reproductive health concern affecting couples worldwide, often accompanied by emotional, psychological, and social distress. Nurses play a crucial role in guiding patients through infertility treatment; however, gaps in updated knowledge may hinder effective care delivery. To assess the effectiveness of simulation-based teaching on knowledge regarding advanced infertility management among staff nurses. A controlled experimental study with pre-test and post-test assessments was conducted among 80 staff nurses selected through simple random sampling. Participants were divided into experimental (n=40) and control (n=40) groups. A structured questionnaire was used to assess knowledge. The experimental group received simulation-based teaching, whereas the control group continued routine learning. Post-test evaluation was done after 10 days. The experimental group demonstrated a significant improvement in knowledge scores compared to the control group ($p < 0.05$). Within-group analysis also showed a marked increase in post-test scores following the intervention. Simulation-based teaching significantly enhances nurses' knowledge regarding infertility management and should be incorporated into nursing education and training programs.

Keywords: Simulation-based learning, infertility, nursing education, knowledge, staff nurses

INTRODUCTION

Infertility is commonly described as the inability to achieve pregnancy after one year of regular, unprotected intercourse. It affects a considerable proportion of couples globally and represents not only a biological issue but also a psychosocial challenge. Individuals facing infertility often experience stress, anxiety, depression, and social stigma, making holistic care essential.

Recent advances in reproductive technologies, such as in vitro fertilization and other assisted reproductive techniques, have significantly improved treatment outcomes. Despite these developments, the role of nurses remains central in patient education, emotional support, and coordination of care. Their level of knowledge directly influences patient understanding, compliance, and overall experience.

Traditional teaching approaches may not adequately prepare nurses for the complexity of infertility care. Simulation-based learning has emerged as an innovative educational strategy that promotes active participation, enhances clinical reasoning, and improves retention of knowledge. By replicating real-life clinical scenarios, it allows learners to integrate theory with practice in a safe environment.

Considering the increasing demand for quality infertility care and the need for skilled nursing professionals, it is essential to evaluate effective teaching methods that can enhance knowledge and competency.

NEED FOR THE STUDY

Although infertility management has advanced significantly, many practicing nurses may not be adequately updated with recent developments. Limited exposure to specialized reproductive care and reliance on conventional teaching methods contribute to knowledge gaps.

Additionally, infertility is closely associated with emotional distress, requiring nurses to possess not only clinical knowledge but also communication and counseling skills. Simulation-based teaching can address both cognitive and affective learning domains by providing realistic patient scenarios.

There is a need to adopt innovative teaching strategies that can improve knowledge, confidence, and clinical decision-making abilities among nurses. This study was undertaken to evaluate the effectiveness of simulation-based teaching in enhancing knowledge regarding advanced infertility management.

OBJECTIVES

1. To determine baseline knowledge regarding infertility management among staff nurses
2. To evaluate the effectiveness of simulation-based teaching regarding infertility management among staff nurses
3. To compare knowledge levels between experimental and control groups
4. To identify the relationship between knowledge scores and selected demographic variables

HYPOTHESES

H_0: There is no significant difference in knowledge scores between groups regarding infertility management among staff nurses

H_1: There is a significant difference in knowledge scores between groups regarding infertility management among staff nurses

MATERIALS AND METHODS

Research Design

A controlled experimental research design with pre-test and post-test evaluation was employed to assess the impact of the educational intervention.

Setting

The study was conducted in selected Community Health Centres in Kanpur, Uttar Pradesh.

Population

Registered staff nurses working in clinical settings.

Sample Size

A total of 80 staff nurses participated in the study.

Sampling Technique

Participants were selected using a simple random sampling method and assigned equally into two groups.

Inclusion Criteria

- Registered nurses with clinical experience
- Willing to participate

Exclusion Criteria

- Nurses unavailable during data collection
- Those previously exposed to similar training

DATA COLLECTION TOOL

A structured tool was used, consisting of:

- **Section A:** Demographic details (age, gender, qualification, experience, residence)
- **Section B:** Knowledge questionnaire (35 multiple-choice questions)

Scoring Criteria

- <50%: Inadequate knowledge
- 51–75%: Moderate knowledge
- 75%: Adequate knowledge

INTERVENTION

The experimental group participated in a structured simulation-based teaching program which included:

- Scenario-based demonstrations
- Clinical case discussions
- Multimedia-supported explanation
- Interactive questioning sessions

Each session was conducted in small groups to ensure active participation and lasted approximately 60–90 minutes.

The control group continued routine clinical learning without additional intervention.

DATA COLLECTION PROCEDURE

The study was carried out over a period of four weeks following administrative and ethical approval. Participants were informed about the study purpose, and voluntary consent was obtained. Initially, baseline knowledge was assessed using a structured questionnaire. The experimental group then underwent simulation-based teaching sessions, while the control group continued with routine practices. After a gap of 10 days, post-test assessment was conducted for both groups using the same tool to evaluate knowledge improvement. Data were carefully collected, verified, and prepared for analysis.

STATISTICAL ANALYSIS

Data were analyzed using descriptive and inferential statistics. Mean, standard deviation, and percentage distribution were used to describe data. Paired and independent t-tests were applied to determine statistical significance. Chi-square test was used to examine associations with demographic variables.

RESULTS

Section 1: Demographic Characteristics of Participants

A total of 80 staff nurses participated in the study, with 40 in the experimental group and 40 in the control group.

The majority of participants in both groups belonged to the age group of 24–30 years, indicating that most were early-career professionals. Female participants constituted the predominant proportion in both groups, reflecting the general gender distribution in the nursing workforce.

With regard to educational qualification, most participants held a Bachelor of Science in Nursing degree, while a smaller proportion had diploma-level qualifications. In terms of clinical experience, the majority had between 1–5 years of work experience, suggesting moderate exposure to clinical practice.

Most participants were from urban backgrounds. Statistical comparison of demographic variables between the experimental and control groups revealed no significant differences ($p > 0.05$), indicating that both groups were comparable at baseline and suitable for further analysis.

Section 2: Pre-Test Knowledge Scores

Baseline assessment of knowledge regarding advanced infertility management revealed that a considerable proportion of staff nurses in both groups had inadequate knowledge.

In the experimental group, the mean pre-test knowledge score was low, with most participants scoring below 50%, indicating poor baseline understanding. Similarly, the control group also demonstrated low knowledge levels, with no statistically significant difference between the two groups ($p > 0.05$).

These findings highlight a clear gap in knowledge among staff nurses regarding infertility management prior to the intervention.

Section 3: Post-Test Knowledge Scores

Following the implementation of the simulation-based teaching program, a marked improvement was observed in the experimental group.

The mean post-test knowledge score in the experimental group increased substantially compared to the pre-test score. Statistical analysis using the paired t-test demonstrated that this improvement was highly significant ($p < 0.05$), indicating the effectiveness of the intervention.

In contrast, the control group showed only a slight increase in post-test scores, which was not statistically significant. This suggests that routine clinical exposure alone did not contribute significantly to knowledge enhancement.

Section 4: Comparison Between Experimental and Control Groups

A comparison of post-test knowledge scores between the experimental and control groups revealed a statistically significant difference.

The experimental group achieved considerably higher mean scores than the control group ($p < 0.05$), as determined by the independent t-test. This clearly indicates that simulation-based teaching was more effective than conventional learning methods in improving knowledge among staff nurses.

Section 5: Distribution of Knowledge Levels

Based on scoring criteria, knowledge levels were categorized as inadequate, moderate, and adequate.

- In the pre-test, the majority of participants in both groups fell under the inadequate and moderate categories.
- In the post-test, a significant proportion of participants in the experimental group shifted to the adequate knowledge category.
- The control group showed minimal change, with most participants remaining in the moderate category.

This shift demonstrates the impact of the intervention in improving knowledge levels.

Section 6: Association Between Knowledge and Demographic Variables

Chi-square analysis was performed to examine the relationship between post-test knowledge scores and selected demographic variables.

The findings revealed that:

- Educational qualification had a statistically significant association with knowledge improvement ($p < 0.05$)
- Years of clinical experience also showed a significant association ($p < 0.05$)

However, variables such as:

- Age
- Gender
- Area of residence

did not show any statistically significant association with knowledge scores ($p > 0.05$).

This suggests that professional education and clinical exposure play a key role in knowledge acquisition.

Section 7: Overall Effectiveness of the Intervention

The overall analysis of results indicates that simulation-based teaching had a significant positive effect on the knowledge of staff nurses regarding advanced infertility management.

The structured, interactive, and experiential nature of the teaching method contributed to better understanding, retention, and application of knowledge compared to traditional learning approaches.

DISCUSSION

The findings of the study demonstrate that simulation-based teaching is an effective method for enhancing knowledge among staff nurses. The improvement observed in the experimental group highlights the value of interactive and experiential learning approaches. These results are consistent with previous studies that emphasize the benefits of structured educational interventions in improving knowledge and clinical competence. Simulation allows learners to engage actively, apply theoretical concepts, and develop problem-solving skills. From a psychological perspective, simulation also enhances confidence, reduces anxiety in clinical decision-making, and improves communication skills especially important in infertility care, where emotional support is essential.

CONCLUSION

Simulation-based teaching is a highly effective educational strategy for improving knowledge among staff nurses regarding infertility management. Incorporating such methods into nursing education can enhance both clinical competence and patient care quality.

RECOMMENDATIONS

- Conduct studies with larger and diverse samples
- Integrate simulation-based training into curriculum
- Evaluate long-term retention of knowledge
- Include communication and counseling components in training

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