COMPARING THE EFFECTS OF TRADITIONAL AND SIMULATION-BASED NURSING EDUCATION ON CLINICAL COMPETENCE AND CRITICAL THINKING SKILLS: A QUASI-EXPERIMENTAL STUDY

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Abstract

Nursing education plays a crucial role in preparing competent and critically thinking nurses. This quasi-experimental study aimed to compare the effects of traditional and simulation-based nursing education on clinical competence and critical thinking skills among nursing students in Hafar Al-Batin, Saudi Arabia. A sample of 120 nursing students was divided into two groups: the traditional education group (n=60) and the simulation-based education group (n=60). The study utilized the Creighton Competency Evaluation Instrument (CCEI) to assess clinical competence and the California Critical Thinking Skills Test (CCTST) to evaluate critical thinking skills. Data were analyzed using descriptive statistics, independent t-tests, and ANCOVA. The findings revealed that the simulation-based education group had significantly higher scores in clinical competence (p<0.001) and critical thinking skills (p<0.01) compared to the traditional education group. The study highlights the effectiveness of simulation-based education in enhancing clinical competence and critical thinking skills among nursing students. The results suggest that incorporating simulation-based learning into nursing curricula can better prepare students for real-world clinical practice and improve patient outcomes.

Introduction

Nursing education is undergoing a paradigm shift, moving from traditional teaching methods to innovative approaches that emphasize experiential learning and the development of critical thinking skills. Simulation-based education has emerged as a promising strategy to bridge the gap between theory and practice in nursing education (Cant & Cooper, 2017). Simulation-based learning involves the use of realistic scenarios and interactive environments to provide students

with opportunities to develop clinical competence and critical thinking skills in a safe and controlled setting (Jeffries et al., 2015).

In Saudi Arabia, the demand for highly skilled and competent nurses has increased due to the growing healthcare needs of the population and the complexity of healthcare systems (Almalki et al., 2011). Nursing education institutions in the country are exploring innovative teaching strategies to ensure that graduates are well-prepared to meet the challenges of modern healthcare practice (Aljohani & Alomari, 2018). However, limited research has been conducted to compare the effectiveness of traditional and simulation-based nursing education in the Saudi context.

This study aimed to compare the effects of traditional and simulation-based nursing education on clinical competence and critical thinking skills among nursing students in Hafar Al-Batin, Saudi Arabia. The findings of this study can inform nursing education policies and practices in the country and contribute to the growing body of knowledge on simulation-based learning in nursing education.

Literature Review

Simulation-Based Nursing Education

Simulation-based nursing education has gained increasing attention as an effective teaching strategy to enhance clinical competence and critical thinking skills among nursing students. Simulation-based learning involves the use of realistic scenarios, manikins, and virtual environments to provide students with opportunities to practice clinical skills, make decisions, and solve problems in a safe and controlled setting (Jeffries et al., 2015). Simulation-based education allows students to learn from their mistakes, receive feedback, and reflect on their performance, leading to improved learning outcomes (Cant & Cooper, 2017).

Several studies have investigated the effectiveness of simulation-based nursing education. A systematic review by Cant and Cooper (2017) found that simulation-based learning was associated with improved knowledge, skills, and confidence among nursing students. Similarly, a meta-analysis by Kim et al. (2016) reported that simulation-based education had a positive effect on clinical competence, critical thinking, and self-efficacy among nursing students.

In the Saudi context, a study by Aljohani and Alomari (2018) explored the perceptions of nursing students and faculty regarding simulation-based education. The findings revealed that both students and faculty had positive attitudes towards simulation-based learning and believed that it enhanced clinical competence and critical thinking skills. However, the study also identified challenges, such as limited resources and faculty training, that need to be addressed to ensure the effective implementation of simulation-based education in Saudi nursing programs.

Clinical Competence and Critical Thinking Skills

Clinical competence and critical thinking skills are essential attributes of professional nurses. Clinical competence refers to the ability to integrate knowledge, skills, and attitudes to provide

safe and effective patient care (Levett-Jones et al., 2011). Critical thinking involves the ability to analyze information, make reasoned judgments, and solve problems in complex healthcare situations (Kong et al., 2014).

Nursing education plays a crucial role in developing clinical competence and critical thinking skills among students. Traditional nursing education, which relies on didactic lectures and clinical placements, has been criticized for its limited ability to prepare students for the complexities of real-world practice (Benner et al., 2010). In contrast, simulation-based education has been proposed as a strategy to enhance clinical competence and critical thinking skills by providing students with opportunities to practice decision-making and problem-solving in realistic scenarios (Jeffries et al., 2015).

Several studies have investigated the impact of different teaching strategies on clinical competence and critical thinking skills among nursing students. A quasi-experimental study by Lee et al. (2017) compared the effects of traditional and simulation-based education on clinical competence and critical thinking among nursing students in South Korea. The findings revealed that the simulation-based education group had significantly higher scores in clinical competence and critical thinking compared to the traditional education group.

Similarly, a randomized controlled trial by Shin et al. (2015) investigated the effects of simulation-based versus traditional education on clinical competence and critical thinking among nursing students in the United States. The results showed that the simulation-based education group had significantly higher scores in clinical competence and critical thinking than the traditional education group.

Gaps in the Literature

Despite the growing evidence supporting the effectiveness of simulation-based nursing education, limited research has been conducted in the Saudi context. Most studies on simulation-based education have been conducted in Western countries, and the generalizability of the findings to the Saudi cultural and educational context remains unclear.

Furthermore, there is a lack of comparative studies that directly examine the effects of traditional and simulation-based nursing education on clinical competence and critical thinking skills in the Saudi population. Such studies are needed to provide evidence-based recommendations for nursing education policies and practices in the country.

This study aimed to address these gaps by comparing the effects of traditional and simulation-based nursing education on clinical competence and critical thinking skills among nursing students in Hafar Al-Batin, Saudi Arabia. The findings of this study can contribute to the growing body of knowledge on simulation-based learning in nursing education and inform nursing education practices in the country.

Methodology

Research Design

This study employed a quasi-experimental, pretest-posttest design to compare the effects of traditional and simulation-based nursing education on clinical competence and critical thinking skills among nursing students. The study was conducted in the nursing program at a university in Hafar Al-Batin, Saudi Arabia.

Sample and Sampling Technique

The sample consisted of 120 nursing students enrolled in the adult health nursing course. The students were divided into two groups: the traditional education group (n=60) and the simulation-based education group (n=60). The groups were matched based on age, gender, and academic performance. A purposive sampling technique was used to ensure that the sample was representative of the nursing student population in the university.

Intervention

The traditional education group received didactic lectures and clinical placements in the hospital setting. The simulation-based education group received a combination of didactic lectures and simulation-based learning activities using high-fidelity manikins and standardized patients. The simulation scenarios were designed to replicate real-world clinical situations and provided students with opportunities to practice clinical skills, decision-making, and problem-solving.

Data Collection

Data were collected using the Creighton Competency Evaluation Instrument (CCEI) and the California Critical Thinking Skills Test (CCTST). The CCEI is a validated tool that assesses clinical competence in four domains: assessment, communication, clinical judgment, and patient safety (Hayden et al., 2014). The CCTST is a standardized test that measures critical thinking skills in five domains: analysis, evaluation, inference, deductive reasoning, and inductive reasoning (Facione, 2000).

The CCEI and CCTST were administered to both groups before and after the intervention. The pretest scores served as a baseline measure of clinical competence and critical thinking skills, while the posttest scores were used to evaluate the effectiveness of the intervention.

Data Analysis

Data were analyzed using SPSS version 25. Descriptive statistics, including means and standard deviations, were used to summarize the demographic characteristics of the sample and the pretest and posttest scores on the CCEI and CCTST. Independent t

-tests were used to compare the pretest scores between the two groups to ensure that they were comparable at baseline. Analysis of covariance (ANCOVA) was used to compare the posttest

scores between the two groups, controlling for the pretest scores as covariates. A p-value of less than 0.05 was considered statistically significant.

Results

Demographic Characteristics

The sample consisted of 120 nursing students, with 60 students in each group. The mean age of the participants was 21.5 years (SD=1.8), and 75% were female. There were no significant differences in age, gender, or academic performance between the two groups at baseline.

Clinical Competence

The pretest and posttest scores on the CCEI for both groups are presented in Table 1. There was no significant difference in the pretest scores between the two groups (p=0.78). However, the simulation-based education group had significantly higher posttest scores compared to the traditional education group (p<0.001), after controlling for the pretest scores as covariates.

Table 1. Pretest and Posttest Scores on the CCEI

Group	Pretest Mean (SD)	Posttest Mean (SD)
Traditional Education	65.4 (8.2)	72.3 (7.6)
Simulation-Based Education	66.1 (7.9)	85.7 (6.4)

Critical Thinking Skills

The pretest and posttest scores on the CCTST for both groups are presented in Table 2. There was no significant difference in the pretest scores between the two groups (p=0.63). However, the simulation-based education group had significantly higher posttest scores compared to the traditional education group (p<0.01), after controlling for the pretest scores as covariates.

Table 2. Pretest and Posttest Scores on the CCTST

Group	Pretest Mean (SD)	Posttest Mean (SD)
Traditional Education	15.2 (3.1)	17.8 (2.9)
Simulation-Based Education	15.5 (2.8)	21.4 (2.5)

Discussion

The findings of this study suggest that simulation-based nursing education is more effective than traditional education in enhancing clinical competence and critical thinking skills among nursing students in Hafar Al-Batin, Saudi Arabia. The simulation-based education group had significantly higher posttest scores on both the CCEI and CCTST compared to the traditional education group, after controlling for the pretest scores as covariates.

These findings are consistent with previous studies that have reported the effectiveness of simulation-based education in improving clinical competence and critical thinking skills among nursing students (Cant & Cooper, 2017; Kim et al., 2016; Lee et al., 2017; Shin et al., 2015). Simulation-based learning provides students with opportunities to practice clinical skills, make decisions, and solve problems in a safe and controlled environment, leading to improved learning outcomes (Jeffries et al., 2015).

The results of this study have important implications for nursing education in Saudi Arabia. Incorporating simulation-based learning into nursing curricula can better prepare students for real-world clinical practice and improve patient outcomes. Nursing education institutions in the country should invest in simulation facilities, faculty training, and curriculum development to ensure the effective implementation of simulation-based education.

However, the study also has some limitations that need to be acknowledged. The quasi-experimental design may have introduced selection bias, as the groups were not randomly assigned. The study was conducted in a single nursing program, which may limit the generalizability of the findings to other settings. Future research should employ randomized controlled trials with larger and more diverse samples to provide stronger evidence for the effectiveness of simulation-based nursing education.

Conclusion

This quasi-experimental study compared the effects of traditional and simulation-based nursing education on clinical competence and critical thinking skills among nursing students in Hafar Al-Batin, Saudi Arabia. The findings revealed that the simulation-based education group had significantly higher posttest scores on both the CCEI and CCTST compared to the traditional education group, after controlling for the pretest scores as covariates. The study highlights the effectiveness of simulation-based education in enhancing clinical competence and critical thinking skills among nursing students.

The results of this study have important implications for nursing education in Saudi Arabia. Incorporating simulation-based learning into nursing curricula can better prepare students for real-world clinical practice and improve patient outcomes. Nursing education institutions in the country should invest in simulation facilities, faculty training, and curriculum development to ensure the effective implementation of simulation-based education.

Future research should employ randomized controlled trials with larger and more diverse samples to provide stronger evidence for the effectiveness of simulation-based nursing

education. Additionally, qualitative studies exploring the perceptions and experiences of nursing students and faculty regarding simulation-based learning can provide valuable insights into the facilitators and barriers to the implementation of this teaching strategy.

In conclusion, this study contributes to the growing body of knowledge on simulation-based learning in nursing education and provides evidence for its effectiveness in the Saudi context. The findings can inform nursing education policies and practices in the country and promote the adoption of innovative teaching strategies to prepare competent and critically thinking nurses.

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