Study of Nursing Students' Experiences pre and post Clinical Practice at clinical skills training center in Duhok city

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Simulation- Nursing Students, Self-Efficacy, Clinical Competence

ABSTRACT
A novel approach to education called simulation-based training offers students excellent chances to acquire and safely apply what they learn about nursing care. The purpose of this study was to evaluate how simulation-based training affected nursing students' abilities as clinical practitioners and their sense of self-Efficaciousness. Subjects and Methods: This study (pre-posttest intervention) employed a quiz-experimental design and was conducted utilizing moderate- and high-fidelity simulators on 63 first-year nursing students for the academic year 2023–2024.At Duhok Polytechnic University and Duhok Technical Institute, this study was conducted. Data collection: demographic information, self-efficacy, and clinical proficiency tests. The software SPSS version 20 is used for analysis. Results: Following their involvement in the simulation program, participants who received the simulation-based training shown statistically significant improvements in their self-Efficaciousness and clinical proficiency levels. Conclusion: Self-Efficaciousness and clinical competency can be improved in nursing courses through simulation-based training. It is strongly advised that the nursing curriculum use multiple-patient simulations as a teaching-learning technique.

1. Introduction

In nursing education, the use of simulation-based instruction has become more and more common in recent years (Cant, & Cooper. ,2017). Before entering the clinical setting, this training approach provides nursing students with a safe, controlled environment in which to refine their abilities and obtain invaluable experience (Davies, et al., 2021).

In nursing education, simulation-based training has drawn more attention as a useful tool that can support the development of clinical knowledge and critical thinking skills. Using mannequins, virtual reality, standardized patients, and other simulation tools to create an authentic clinical setting is known as simulation-based training in nursing education. This approach helps students hone their skills in a real-world clinical setting (Sterner, et al., 2023). Through simulation-based training, students can learn from their errors and accelerate their progress while receiving prompt feedback from teachers. This can boost their self-assurance and competency in patient care (Zottmann, et al., 2018).This approach creates a safe and controlled atmosphere so that trainees can learn and make mistakes without hurting patients (Lioce, et al., 2015). The effectiveness of simulation-based training

in nursing education has been the subject of numerous research studies, many of which have produced positive results. For example, a systematic review and meta-analysis were conducted, which demonstrated the beneficial effects of simulation-based training on nursing students' knowledge, abilities, and clinical reasoning (Orique, & Phillips., 2018). Clinical decision-making skills among nursing students were enhanced by simulation-based training, which also made it easier for them to apply theoretical information in real-world clinical settings (Awang-Harun, et al.,

2022).By reducing the frequency of procedural complications during central venous catheter insertion, simulation-based training improved patient outcomes. However, despite an increasing amount of evidence supporting the efficacy of simulation-based training in nursing education, concerns remain regarding its best application and efficacy in a variety of populations (Kim, et al., 2016).Even with an increasing amount of evidence demonstrating its efficacy, research on its best application and efficacy in a range of people is still necessary. Long-term cost-effectiveness and the ability to enhance patient outcomes and lower medical errors are two benefits of simulation-based training (Kardong-Edgren, et al., 2010).Research on its ideal application and efficacy in a range of people is still necessary, although the increasing amount of data demonstrating its efficacy. Long-term cost savings and improved patient outcomes and a decrease in medical errors are two benefits of simulation-based training (Koukourikos, et al., 2021).

1.1. Importance of the Study

This study's examination of the efficacy of simulation-based learning in nursing education is what makes it significant. This study offers important insights into the effects of simulation-based training on nursing students' clinical skills, knowledge, reasoning abilities, clinical decision-making, and patient outcomes by doing a systematic review of the literature. The results of this study can help educators, curriculum designers, and policymakers in nursing education make well-informed choices on the use of simulation-based teaching techniques (Koukourikos, et al., 2021).

1.2. Aim of This Study

Aim of this study is to evaluate how clinical skill development in nursing education is affected by simulation-based education.

1.3. Study hypotheses

1-What impact does simulation-based learning have on students' clinical knowledge and skills?

2- How do students' learning outcomes change when they get instruction through simulations?

2. Subjects and Methods

2.1. Study Design

This study employed a quasi-experimental one-group pretest-posttest design.

2.2. Study Setting

This study was conducted in the Nursing Department - Duhok Technical Institute - Duhok Technical University in cooperation with Clinical Simulation Training Center in Duhok city.

2.3. Period of the study

The first day of the study was November 1, 2023, and it ended on May 1, 2024.

2.4. Sample

A convenience sample of 63 students from the first stage in the nursing department at Duhok

Technical Institute for morning study.

2.5. Instruments

The "questionnaire" that the researchers created for the study was based on the findings of a literature review and was evaluated by numerous referees (Mohamed, and Fashafsheh., 2019) , (Ayla Demirtas. et al., 2022). After compiling all of the data, the study's instruments were divided into two distinct groups:

Part I: Constructing Students' Self-Efficaciousness Questionnaire:

This part of questionnaire consisted of 10 items with a 5-point scale, each response starts from 1 (strongly disagree) to 5 strongly agree. Scale score range from 10 to 50.

Part II: Creating Clinical Proficiency Questionnaire

It is used to assess how nursing students feel about the Clinical Skills Training Center's instruction and learning environment. There are ten questions in all.

Every question had a 5-point Likert scale with maximum 50 and minimum 10 points, ranging from (5) strongly agree to (1) strongly disagree.

2.6. Validity and Reliability of the Tools

Five experts in the fields of nursing and medical education completed the face and content validity of the instruments, and any necessary adjustments were made. The internal consistency technique was used to assess the tool's reliability. It turned out to be highly reliable, with correlation coefficients of 0.86 and 0.87.

2.7. Pilot Study

In order to ensure that the application was clear and applicable and to find any issues with it, 10 students participated in a pilot study.

2.8. Ethical Considerations

Students who willingly consented to participate were informed both orally and in writing about the study's objectives and methodology. They were also informed of their ability to withdraw from the study at any time without cause. The information supplied to the researcher is guaranteed to remain strictly secret. Additionally, the study was approved locally for conduct by the Ethical Committee of the Directorate General of Health Directorate of Planning Scientific Research Division.

2.9. Data Analysis

The statistical data analysis was carried out using the Statistical Package for Social Science (SPSS) software after all the data were loaded into a database. It was determined that a p-value of 0.05 was statistically significant. The results were presented as means, standard deviation, Correlation coefficient (r), and paired t-tests to help identify the statistical significance of the various variables.

3. Results

Table 1 Described the comparison between pre- and post- training simulation in the center related to Students' Self-

Efficaciousness after training in the center. Also, improved means scores of all items for the post-training simulation (2.62 and 3.16 respectively).

Table 2: Reports that improved mean scores of all items of clinical proficiency posttest simulation training compared with pretest simulation (2.89 and 3.27 respectively).

Figure1: Differences between total students' mean of Self-Efficaciousness in base line test and after training simulation posttest. It reveals that a significant statistical difference regarding pre and post-intervention ($t = -4.17$, $p < 0.000$).

Figure2: Differences between total students' mean of clinical proficiency in base line test and after training simulation posttest. It reveals that a significant statistical difference regarding pre and post-intervention ($t = -4.14$, $p < 0.000$).

Table1: Compare between pre- and post- students' mean of training simulation in the center related to Students' Self-Efficaciousness (N = 63).

Item	Pre training	Post training	Test statistics	
	M (SD)	M (SD)	t-test	P value
1-Do you think the teaching methods used at the Clinical Skills Training Center are useful and effective?	2.86 ± 0.74	2.87± 0.87	-0.15	0.88
2-Because the training center is based on high-fidelity patient simulation, you have faith in it.	2.63 ± 1.18	2.83 ± 0.87	-1.33	0.19
3-The training center always enables you to solve complex problems when caring for patients	2.90 ± 0.53	3.16 ± 0.95	-2.02	0.05
4-Will the training facility adequately equip you for a career in nursing?	2.35 ± 1.03	2.65 ± 0.99	-2.12	0.04
5-Will the training facility instill trust in you to provide effective care?	2.44 ± 0.74	2.76± 0.82	-3.00	0.00
6-Will the training center enable you to deal with difficult situations	2.46 ± 0.80	2.73± 0.81	-2.87	0.01
7-Will you be able to handle the majority of the patient's difficulties thanks to the training center?	2.40 ± 0.77	2.65 ± 0.77	-1.99	0.05
8-The training facility will assist you in integrating theory and practice in an efficient manner.	2.86 ± 0.53	3.14 ± 0.84	-2.22	0.03
9-Will the training facility assist you in remaining composed when faced with challenges while providing patient care?	2.51 ± 0.80	2.62 ± 0.77	-0.91	0.37
10-The training facility will educate you how to solve problems when they arise while providing patient care.	2.41± 0.73	2.79 ± 0.79	-3.41	0.00

Table 2: Comparison between pre- and post- students' mean of training simulation in the center regarding Clinical Proficiency (N = 63).

Item	Pre training	Post training	Test statistics	
	M (SD)	M (SD)	t-test	P value
1-Procedures can be repeated at the Clinical Skills Training Center (CSTC) until you are confident you are carrying them out appropriately.	2.90 ± 0.82	3.11 ± 1.05	-1.56	0.120
2-Youe activities at CSTC assist you in comprehending the theoretical knowledge you possess.	2.90 ± 1.06	3.21 ± 0.92	-2.17	0.034
3-During your tenure at CSTC, your clinical abilities will continuously grow.	3.03 ± 0.51	3.27 ± 0.92	-2.08	0.042
4-Students get more self-confidence when they practice in CSTC and apply the same technique to patients.	2.75 ± 0.86	3.06 ± 1.08	-2.03	0.047
5-The greatest way for us to learn is for teachers to model the skill before I try it myself.	2.68 ± 0.86	3.10 ± 0.95	-2.83	0.010
6-The center has realistic-looking nursing dummies to aid in my skill-building.	2.81 ± 0.93	3.11 ± 0.83	-2.14	0.036
7-Learn a lengthy and intricate technique quickly at the Clinical Skills Training Center.	2.60 ± 0.85	3.06 ± 0.90	-3.72	0.000
8-It's beneficial to be able to identify and fix errors without causing harm to others.	2.90 ± 0.53	2.89 ± 0.79	0.16	0.870
9-Clinical training is safer for patients when it incorporates practice from the Clinical Skills Training Center.	2.84 ± 0.90	2.97 ± 0.84	-1.02	0.310
10-In the clinical setting, the abilities acquired and honed at CSTC can be more effectively applied.	2.76 ± 0.87	3.00 ± 0.88	-1.52	0.130

Figure 1. Total mean of students' Self-Efficaciousness pre /post training simulation.

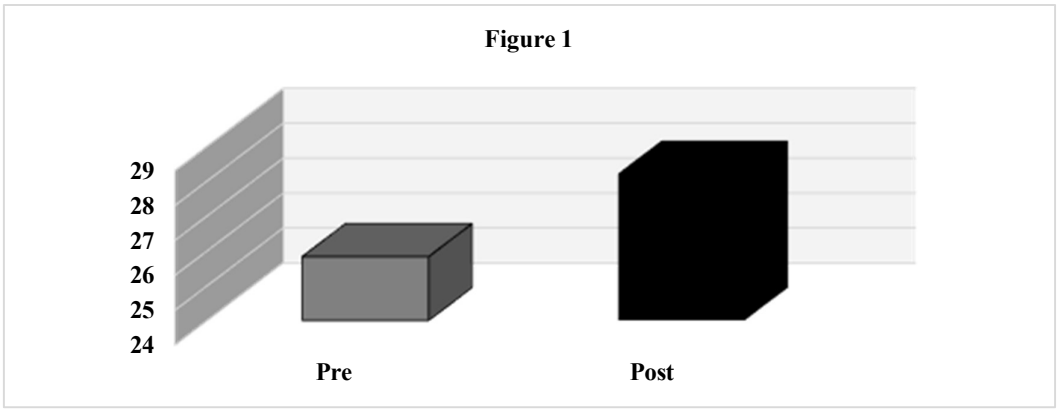
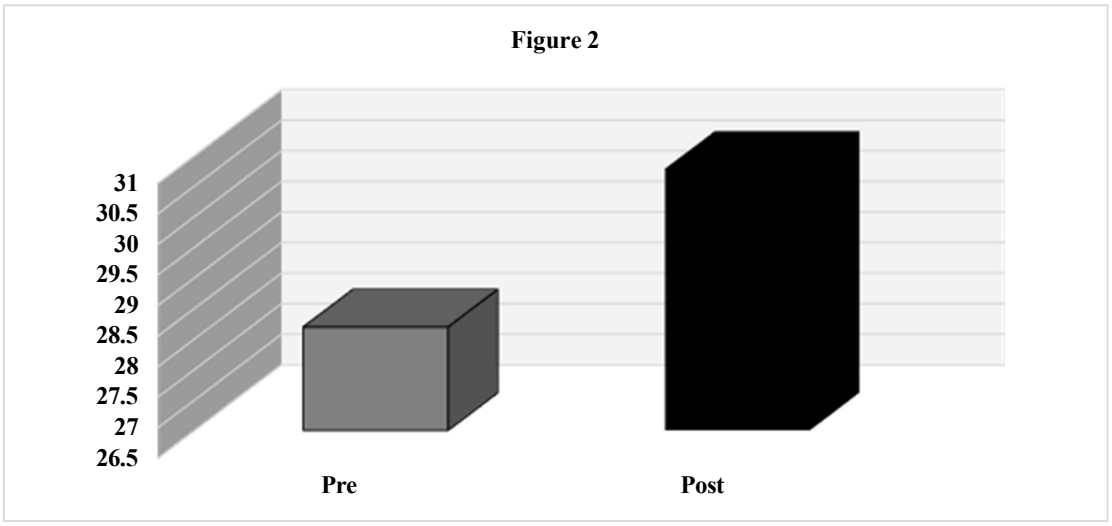


Figure 2. Total mean of students' clinical proficiency pre /post training simulation.



4. Discussion:

The results of the review indicated that simulation-based training is a successful method to nursing education. The findings of these studies contribute in many ways to the evaluation of the effectiveness of simulation-based teaching. The review's included studies consistently demonstrated how simulation-based instruction enhanced nursing students' clinical reasoning, knowledge, and skill sets. This outcome is in line with research by Koukourikos et al. (2021), which found that applying simulation to students aids in the development of clinical skills.

Research has indicated that simulation-based training can enhance clinical decision-making, lead to better patient outcomes, and facilitate the application of theoretical knowledge to clinical practice. The outcomes of a study by Lioce et al. (2015) corroborate these findings. Through the use of a control group design, the study illustrates the efficacy of full-scale simulator training in fostering the development of Crisis Resource Management skills. Flentje et al.'s (2020) similar study found that training improved collective orientation.

In addition, it looks at how simulation can be integrated into a multimodal pedagogy and measures overall post-test theoretical and clinical assessment performance, which adds to our understanding of how effective this instructional approach is. The results show how simulation scenarios affect nursing competence, self-efficacy, and learning satisfaction scores, demonstrating the effectiveness of simulation in improving these outcomes. This outcome is in line with research by Rizzolo et al. (2015) and Motola et al. (2013) that corroborate their findings and demonstrate the value of simulation in the classroom.

A study conducted by Kim et al. (2016) looked at how simulation affects learning and memory in the cognitive domain. When compared to traditional educational approaches, the study indicated that participants who received simulation training significantly improved their knowledge and comprehension of difficult medical concepts. Through active engagement in realistic settings, the simulation fostered critical thinking, problem-solving, and decision-making skills in the learners.

Important considerations are how simulation affects clinical practices and patient outcomes. A study by Yun et al. (2023) looked into how simulation training affected nursing students' clinical behaviors. The results showed that those who received simulation training had better clinical abilities, including precise patient assessment and efficient patient communication.

The current study's findings indicate that after simulation, self-Efficaciousness scale mean scores were higher than they were before. This result is consistent with 63 students' pretest and posttest intervention results. After participating in a simulation program, the author observed a considerable improvement in the students' self-efficacy in their skill performance and learning as well as a favorable impact on their achievement outcome.(Mohamed & Fashafsheh, 2019)

Furthermore, Shinnick et al. found that there was a difference in SE scores between the experimental group and the control group in their quiz experiment including 161 students from three nursing schools.

In a similar vein, Paravattil proposes that following a simulation-based education program, nursing students of medical-surgical graduate nurses exhibit high levels of self-efficacy and learning outcomes.

As compared to before and after simulation-based training, the current study's results showed a statistically significant improvement in the clinical competency scale. This outcome aligned with the findings of a randomized controlled experiment (RCT) that was done by Dahye and Hyun-Jung, wherein 35 nursing students received pre-post intervention training in medical-surgical nursing education. They discovered that there were statistically significant gains in clinical competency, knowledge, self-assurance, and critical thinking for advanced cardiovascular life support.

In a cross-sectional study including thirty-three nursing students, Williams and Song also shown that the use of simulated patients (SPs) enhanced the clinical competency of the participants.

5. Limitations of the Study

Participants weren't chosen at random

6. Conclusion and Recommendations

The results of this study demonstrated that after participating in a simulation-based program, students' mean scores on measures of clinical competence and self-efficaciousness improved. Subsequent studies should incorporate the multiple-patient simulation within the nursing curriculum as a teaching-learning method. Replicating the study in a broader sample of nursing bachelor's degree students from several universities may also produce more broadly applicable results.

Conflicts of Interest

Regarding the publishing of this paper, the authors state that they have no conflicts of interest.

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