Original Article

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Evaluating the Effect of Scenario-Based Learning on the Knowledge, Attitude, and Perception of Nursing and Midwifery Students about Patient Safety

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Introduction: Patient safety is the most important priority in the healthcare system. Medical universities always attempt to find innovative and more effective educational methods to improve the students' abilities for clinical decision-making and quality and safe care. Thus, this study was designed to evaluate the effect of scenario-based learning on the knowledge, attitude, and perception of nursing students about patient safety.

Methods: This quasi-experimental study was conducted between September 2023 and January 2024. The study sample comprised 78 nursing and midwifery students from the fourth and fifth semesters of their bachelor's degrees, each of whom was systematically reviewed. The participants were allocated to the intervention (n=43) and control groups (n=35) randomly, using simple randomization. The educational content was presented via scenario-based learning for participants in the intervention group, while it was presented through lecture and discussion in the control group. The questionnaire was standardized and structured, and its validity and reliability were assessed. Data gathering was performed one month after the intervention using a knowledge, attitude, and practice questionnaire. Data were analyzed in SPSS software version 16 using descriptive statistical methods and inferential tests, including the chi-square test, independent T-test, paired T-test, and ANCOVA.

Results: The study findings indicated that there were no significant differences in attitude (P=0.152) and perception (P=0.264) scores between the intervention and control groups before the intervention. However, after the intervention, a significant difference was observed (P<0.001). [Knowledge 14.97±3.70 vs. 19.37±3.31), attitude (31.74±5.38 vs. 34.62±9.59), perception (35.60±7.51 vs.38.95±8.21)].

Conclusion: Scenario-based learning can be a more effective way to teach nursing and midwifery students about patient safety. Thus, researchers recommend that this educational method should be used by nursing and midwifery instructors to improve the students' ability to provide safer care for patients.

Keywords: Education, Learning, Patient safety, Students

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Introduction

Patient safety is of critical importance throughout the whole continuum of care (1, 2). Although providing safe care is the main goal of the health system, patient safety is at risk because of discoveries and new methods in the health system (3), and these changes lead to detection of some incidences as Never Events in the healthcare system. Protection of patient safety was given more attention, particularly when an error report program was presented by the American National Institutes of Health (4, 5). This institute characterizes patient safety as a field within healthcare that utilizes safety science techniques to create a reliable healthcare delivery system. Additionally, patient safety is a fundamental aspect of healthcare systems; it aims to reduce the occurrence and consequences of adverse events while enhancing recovery from them. In simpler terms, patient safety refers to preventing unintentional or unforeseen harm to individuals during their healthcare experience. Nowadays, this concept is an internal part of health systems and one of the cornerstones of quality care evaluation. Patient safety is a part of the accreditation of hospitals, and it has been performed as a pilot method in some hospitals in Iran in recent years (6-8).

Incidents due to unsafe care are one of the top ten causes of death and disability in the world (8, 9) 134 million adverse events occur in LMICs1 due to unsafe care, and this leads to 2.6 million deaths (10) Universally, 4 out of 10 patients are injured in primary care and in-patient care, and 80% of these injuries are preventable (11). In addition, 15% of hospital expenses in the OECD are directly due to Never Events, so every investment in the improvement of patient safety can bring significant economic efficiency (12).

On one hand, organizational culture in some clinical environments hinders improving patient safety and reducing medical errors (13). Focusing on students' education regarding patient safety is one of the best ways to develop a patient safety culture in clinical situations (4). Students have a direct role in the occurrence of some Never Events in clinical environments, so they need to gain knowledge related to patient safety to be able to prevent injuries to patients in the future as part of medical teams (13, l4). Newly qualified nurses should be able to detect possible risks to patient safety and protect patients from preventable events confidently (15-17). Nurses and midwives have an outstanding role in patient safety. Thus, nursing and midwifery students should apply their knowledge to look after patients safely (16-18).

On the other hand, an inappropriate attitude toward patient safety can be one of the reasons for the occurrence of Never Events (19). As people's attitudes obviously affect their behavior and practice, changing the staff's attitude can have a significant effect on the safe provision of care. Nurses and midwives are a remarkable section of healthcare providers and evaluating nursing and midwifery students' knowledge and attitudes toward patient safety is necessary as they will be newly qualified staff members in the health system soon (20, 21).

Finding the best educational method to improve students' clinical decision-making abilities is one of the main goals of universities (22). New student-centered methods have been applied more in universities in recent decades. A clinical scenario is an innovative educational method that can improve the students' perception regarding issues in clinical environments and facilitate their clinical learning process (23). Gaining basic clinical knowledge and improving critical thinking and problem-solving skills are the goals of Scenario-Based Learning. It can be used as a helpful method for simulation, case reviews, and other projects (24).

The World Health Organization has identified learning patient safety as an essential part of education for medical and nursing students, and the health ministry has introduced some plans to improve patient safety (25). Based on an enactment legislated by the Ministry of Health and Medical Education of Iran, nursing and midwifery students must attend a patient safety workshop in one semester. This workshop was planned to provide students with safer care (16). By considering the importance of patient safety and applying new education methods in this field, we designed the present study to evaluate the effect of SBL on the knowledge, attitude, and practice of nursing students regarding patient safety.

Methods

Study design and method

This quasi-experimental study was conducted at the School of Nursing and Midwifery, Mashhad University of Medical Sciences from September 2023 to January 2024. In the intervention group, the researcher presented scenarios related to patient safety to the participants. Then, the participants were supposed to revise the scenario for one week. Next, the researcher explained and clarified the presented problem in the scenario. After that, participants discussed the identified problem with each other. They should make a list of evidence perceived from the scenario, create some hypotheses, and respond to the

present question considering the nursing process. Participants improve their information using reference books and online resources. Finally, the researcher analyzed the suggested solutions according to the question and hypotheses and evaluated and concluded all suggestions. One SBL session lasted 45 to 60 minutes, and three SBL sessions were conducted for the intervention group. Researchers presented educational content through lectures for the control group.

Sampling and participants

The study included 78 nursing and midwifery students from the fourth and fifth semesters of their bachelor's degrees, who met the following inclusion criteria: being willing to participate in the study, studying in the fourth or fifth semester of their bachelor's degree, and not participating in a similar education course. Students were excluded if they were unwilling to continue or were absent for more than two education sessions. Sample size calculations were based on the mean and standard deviation (SD) of a similar study, considering an effect size (ES) of 0.814, α=0.05, and a power of 90%. Students were then allocated to the intervention and control groups based on simple random sampling. The intervention group consisted of 43 students, while the control group comprised 35 students.

Research tools

Data were gathered using a questionnaire developed by Leung and Madigoskay et al (26, 27). This questionnaire consists of two sections (28). In the first section, demographic data are collected, and the second section includes 26 questions: 6 questions evaluates students' knowledge about patient safety, 8 questions evaluate students' attitude towards patient safety, and 12 questions were related to students' perception about patient safety. Scoring is based on 5-point Likert scale with the following scores for attitude and perception: completely disagree=1, disagree=2, not agreeing and not disagreeing=3, agree=4, and completely agree=5. The scores for knowledge include very weak=1, weak=2, moderate=3, good=4, and very good=5. This questionnaire was translated into Persian in a study conducted by Nabilou et al. (25) and then it was translated into English (forward and backward translation method). The English version was evaluated by two qualified faculty members. Finally, the research team and 4 patient safety officers assessed the questionnaire and approved its validity. The reliability of the questionnaire was 0.723 that was approved using α internal consistency Cronbach coefficient (23).

Data collection

Researchers explained the goals of the study to the participants, and all the participants signed a consent form for participation in the study. Questionnaires were completed by participants before and one month after the interventions. SBL sessions were conducted by the researcher for the intervention group. Also, these sessions were presented for the control group after all questionnaires were filled out by participants in this group.

Data analysis

Data analysis was performed using SPSS version 16, incorporating descriptive statistics (mean and standard deviation) and inferential statistics (chi-squared test, independent sample t-test, repeated-measures t-test, and ANCOVA). The chi-squared test was utilized to assess categorical data for differences between the groups. The independent sample t-test was employed to compare the means between the two independent groups. The repeated-measures t-test was used to compare the means of the same group at different time points. ANCOVA (Analysis of Covariance) was utilized to compare the group means while controlling for potential confounding variables (29). Additionally, researchers applied the CONSORT 2010 guidelines to ensure a quality report for the study (Figure 1).

Ethical consideration

All research protocols were conducted under the supervision of the University Ethics Committee (Ethic NO: IR.MUMS.NURSE.REC.1400.136). The participants' information remained confidential, and all the selected individuals participated in this study after their consent was obtained. In addition, the participants had the absolute right to withdraw from the study at each stage.

Results

The analysis of covariance results indicated a significant difference between the groups in pre-intervention knowledge scores ($F=9.52$, $P<0.001$). Additionally, a significant effect was observed on post-intervention knowledge scores ($F=1.09$, $P=0.279$). Furthermore, a significant difference in knowledge change was found between the two groups ($F=2.50$, $P=0.0016$), indicating that the SBL intervention had a different effect on knowledge change.

These results suggest the presence of a significant interaction between the group and intervention time. It is suggested that an experienced statistical biologist should be

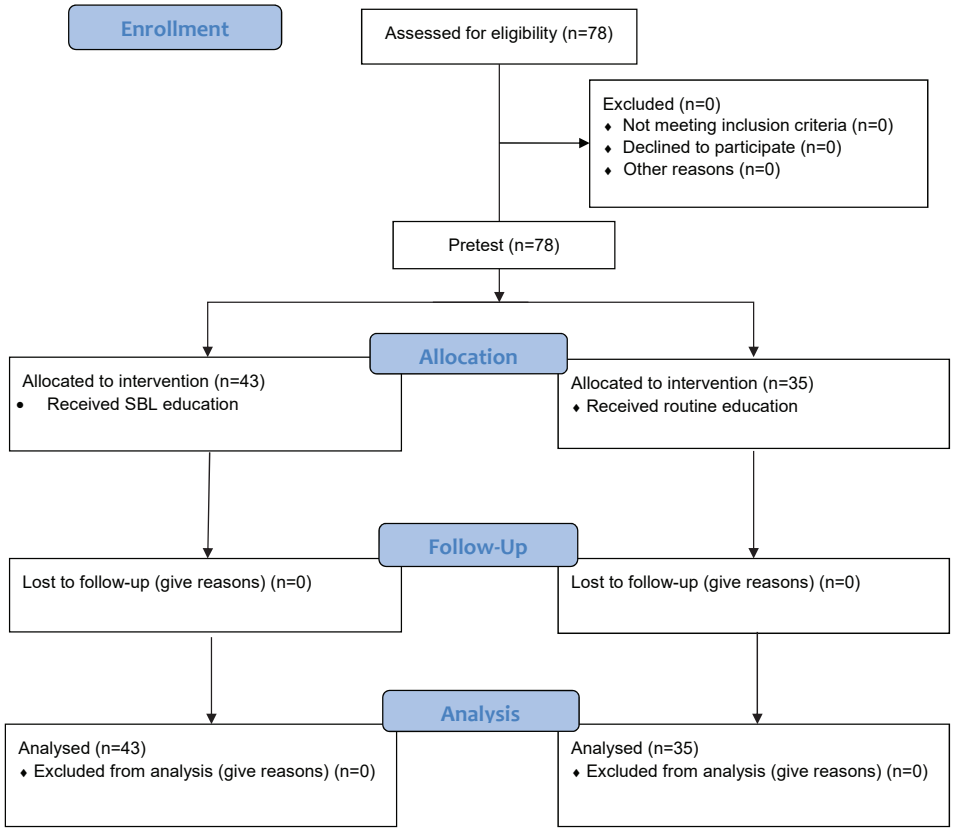

Figure 1: CONSORT Flowchart

Table 1: Participants' Demographic Characteristics in the Control and Intervention Groups

Variable		Control Group Number (%)	SBL Group Number (%)	Test
Gender	Male	12 (33.3)	24 (66.7)	X^2=3.59 P=0.058
	Female	23 (54.8)	19 (45.2)	
Semester	4th	14 (38.9)	22 (61.1)	X^2=0.96 P=0.325
	5th	21 (50)	21 (50)	
Marital Status	Single	32 (47.1)	36 (52.9)	X^2=1.02 P=0.311
	Married	3 (30.0)	7 (70.0)	
Accommodation	Dormitory	23 (45.1)	28 (54.9)	X^2=0.003 P=0.956
	Home	12 (44.4)	15 (55.6)	
Discipline Interest	Yes	22 (45.8)	26 (54.7)	X^2=0.47 P=0.849
	No	13 (43.3)	17 (56.7)	
Working Experience	Yes	3 (60.0)	2 (40.0)	X^2=0.494 P=0.482
	No	32 (43.8)	41 (56.2)	
Age (Mean±SD)		23.26±1.40	22.95±1.64	t=0.756 P=0.390
GPD		16.10±0.77	16.08±1.14	t=0.364 P=0.717

consulted for further analysis. Seventy-eight nursing and midwifery students participated in this study. There was no significant difference between the intervention and control groups regarding age, sex, education semester, marital status, clinical working experience, and GDP (Table 1). Regarding knowledge, attitude, and perception after the intervention, there was no significant difference in the control group, while a significant increase was observed in these scores in the intervention group (Table 2).

Analysis of Covariance (ANCOVA) was utilized to examine the impact of Simulation-Based Learning (SBL) intervention on students' knowledge scores post-intervention. Before the intervention, there was a significant difference in the mean knowledge scores of students in the control and intervention groups. Subsequently, Levene's Test was employed to assess variance homogeneity, confirming the effect of SBL on

Table 2: Knowledge, Attitude, and Perception Scores before and after the Intervention

Variable		Control Group Mean±SD	SBL Group Mean±SD	Test	
Knowledge	Before Intervention	10.28±3.18	14.97±3.70	t=0.591 P=0.001	F=12.45, P<0.001
			19.37±3.31	t=9.71 P=0.001	F=7.82, P=0.003
	Change	10.66±1.06	17.17±-0.39		
	Test	t=0.06 P>0.05	t=0.02 P=0.05		
Paired t-test		t=-1.09 P=0.279	t=-9.52 P=0.001		
Attitude	Before Intervention	30.11±4.36	31.74±5.38	t=1.44 P=0.152	F=9.67, P<0.001
	After Intervention	29.77±3.99	34.62±9.59	t=2.80 P=0.006	F=5.92, P=0.008
	Change	-0.37±29.94	33.18±4.21		
	Test	t=0.01 P=0.99	t=0.12 P=0.001		
Paired t-test		t=0.636 P=0.529	t=-2.50 P=0.001		
Perception	Before Intervention	33.88±5.56	35.60±7.51	t=1.12 P=0.264	F=8.23, P<0.001
	After Intervention	32.88±5.09	38.95±8.21	t=3.81 P=0.0001	F=6.55, P=0.005
	Change	36.41±2.65	37.27±0.70		
	Test	t=0.07 P=0.99	t=0.18 P=0.001		
Paired t-test		t=1.58 P=0.122	t=-2.15 P=0.037		

the significant difference in knowledge scores post-intervention (P<0.05, F=40.90). Ultimately, given the validation of the model assumptions and confirmation of the significant effect of SBL on post-intervention knowledge scores, it can be concluded that SBL has a positive impact on enhancing students' knowledge.

Discussion

The present study evaluated the effect of SBL on the knowledge, attitude, and perception of nursing students toward patient safety. Based on the results of this study, SBL resulted in an improvement in students' knowledge, attitude, and perception regarding patient safety. Biresaw et al. evaluated the nurses' knowledge and perception of patient safety. More than half of the nurses who participated in their study had insufficient knowledge about patient safety. These researchers recommended that it is essential to apply a more effective educational method for patient safety to improve the nurses' knowledge and perception (30). Tracy et al. stated the necessity of special attention to patient safety education for students. They suggested that universities should consider a specific unit for patient safety in the bachelor's curriculum (31).

Camila et al. showed that SBL improves the students' self-confidence and satisfaction. Students who attended SBL sessions could analyze and manage clinical cases with higher self-confidence, show better critical thinking ability, and make more effective clinical decisions. Thus, SBL can result in providing safer care for patients (32).

Rashwan illustrated that SBL could significantly improve nursing students' self-confidence in collecting clinical data and detecting abnormal changes in clinical parameters. Thus, these positive results can lead to safer care for patients. Additionally, SBL is an effective educational method for enhancing the students' ability to apply their knowledge into practice, which can eventually improve patient safety as a main goal of healthcare (33).

In another study, Andy et al. evaluated the effect of SBL on nursing and midwifery students' knowledge and perception in a qualitative study. According to the findings, SBL can develop and enhance students' knowledge and perceptions regarding moral and legal issues in the healthcare system. In addition, they stated that SBL could be an effective method to develop students' knowledge and perception related to patient safety (34).

Yilmaz et al. evaluated the effect of SBL on nursing students' safety behavior. The findings of the study showed a significant change in

performing nursing skills more safely by students. Thus, the researcher highly recommended SBL as an effective educational method to improve patient safety. These findings are consistent with those of the present study (35).

Rashwan showed in a study that SBL was an effective method for enhancing nursing students' self-confidence. In addition, it can enable students to develop their technical competencies, critical thinking, and problem-solving skill (33). Sadeghi et al. achieved the same results in their study regarding the effect of SBL on improving nursing students' core competencies. These competencies include critical thinking, clinical skills, basic medical science, communication skills, care, continuous learning, ethics, and responsibility (36). All the skills and competencies mentioned in these two studies can have a significant effect on patient safety and quality of healthcare. Additionally, these results prove the effectiveness of SBL in healthcare field as a new method of education.

Uysal analyzed the impact of SBL on students' learning skills. Nurcan determined that SBL garnered a favorable reaction from both students and instructors, indicating that SBL can be utilized alongside other skills training approaches (37).

Ocaktan et al. utilized Simulation-Based Scenario Implementation in Patient Safety Education. Their findings indicated that incorporating scenarios into education about patient safety in the operating room proved more effective when conducted prior to actual clinical practice. Additionally, this preclinical implementation enhanced the sense of realism, even in the absence of direct clinical experience (38). Asadi et al. examined 11 relevant articles on clinical education focused on patient safety and error prevention among midwifery students. Based on their findings, they suggested that midwifery instructors should adopt active teaching strategies, such as simulated methods and group discussions, SBL, and problem-based learning to increase patient safety and improve midwifery care (39). Therefore, SBL can be considered an effective method in teaching patient safety, and it is recommended that SBL should be used more by instructors in healthcare education such as nursing and midwifery.

Limitations

This study had limitations as to the short time of intervention that was due to the students' intensive curriculum during the mentioned semesters. Therefore, this limitation should be considered in using the findings of the current study.

Conclusion

The protection of patient safety is one of the principles in the healthcare system, so applying the best educational method to develop the knowledge, attitude, and perception of healthcare providers regarding patient safety is essential. Nursing and midwifery students, as the main healthcare providers, need to achieve a proper perception and attitude toward patient safety. The findings of this study showed that SBL could be a more effective method to teach the nursing and midwifery students patient safety compared with lectures. Therefore, researchers recommend this method to enhance students' knowledge, perception, and attitude toward patient safety.

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Authors' Contribution

All authors contributed to the discussion, read and approved the manuscript and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated resolved.

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Conflict of Interest

The authors declare no conflicts of interest.

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