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The effect of simulation-based education on childhood epileptic seizure management knowledge, skills, and attitudes of nursing students

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ABSTRACT

Background: Lack of knowledge about epileptic seizure management and negative attitudes toward children with epilepsy among nursing students may negatively affect the quality of healthcare services they deliver.
Aim: This study aimed to examine the effect of training given to nursing students using simulation and standard child mannequins on their childhood epileptic seizure management knowledge, skills, and attitudes.
Methods: Participants (n = 72) were recruited from a Nursing Faculty in Izmir, Turkey. Students were randomly assigned to the intervention and control groups (n = 36 in each). The intervention group received simulation-based training on epilepsy while the control group received standard child mannequin training on epilepsy. One week after the training, the students were asked to demonstrate their epileptic seizure management knowledge and skills on a simulation model or a standard child mannequin. During this process, they were observed and assessed by two independent observers on the basis of a list of epileptic seizure management skills. All participants completed the personal information form, the Epilepsy and Epileptic Seizure Management Knowledge Test, and the Epilepsy Knowledge and Attitude Scale before, and after the training, McNemar's test, repeated measure ANOVA (intravenous), dependent t-test, chi-square test, Fisher's exact test, independent t-test, Pearson's correlation analysis, and Pearson's chi-square test were used to compare the groups. Intraclass correlation coefficient (ICC) was used to evaluate the consistency between observers.
Results: The epilepsy knowledge scale mean scores of both groups significantly increased after their respective trainings ($p < 0.001$), but the difference between the groups was not statistically significant ($p = 0.829$). There was no statistically significant difference between the pre- and posttraining epilepsy attitude scale mean scores of the control group ($p = 0.630$), however, a statistically significant increase was observed in the epilepsy attitude scale mean score of the intervention group ($p = 0.008$). In addition, both groups' self-confidence in epileptic seizure management significantly increased after the training ($p = 0.000$).
Conclusions: Simulation-based training was beneficial for students insofar as it helped them to develop positive attitudes toward epilepsy.

1. Introduction

Childhood epilepsy is a chronic disease with physical, psychological, and social dimensions [1]. The social acceptance of children with epilepsy is a significant problem for both the children and their families. Children with epilepsy are exposed to social discrimination because of common negative social attitudes and misunderstandings about epilepsy [2,3]. These negative attitudes toward epilepsy can be seen in Turkey and result primarily from lack of information about epilepsy [4]. These negative attitudes take on particular importance when they are held by healthcare providers toward patients with epilepsy. Nursing students' lack of knowledge about epileptic seizure management and their negative attitudes toward children with epilepsy may negatively affect the quality of healthcare services they deliver [3,5]. One study reported that Japanese nurses had insufficient knowledge about epilepsy [6] while another, conducted in Brazil, reported that nurses and doctors had a higher level of knowledge about epilepsy compared with that of other healthcare professionals. Both studies emphasized the importance of epilepsy education for healthcare providers [6,7]. The studies conducted in Turkey found that Turkish nurses had a moderate level of knowledge regarding epilepsy, and that while they generally displayed a positive attitude toward epilepsy, it was nonetheless not sufficient. These studies also reported a positive relationship between the nurses'

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knowledge and attitudes regarding epilepsy and noted that as their knowledge about epilepsy increased, they exhibited more positive attitudes toward epilepsy [8,9].

It is also important to emphasize the importance of knowledge about epileptic seizure management and attitudes toward epilepsy for students in the faculty of health sciences. In one study, it was reported that dental students generally exhibited negative attitudes toward epilepsy [3]. Another study determined that nursing and laboratory students had high levels of knowledge about epilepsy [10]. In the literature review conducted for this study, there was no study on the effect of epilepsy educational training given to students during undergraduate study on their attitudes toward patients with epilepsy. In emergency cases requiring urgent intervention, such as in cases of epileptic seizures, nursing students are expected to make rapid observations, make proper decisions, transform theoretical knowledge and skills into practice, and apply accurate interventions, all of which require a positive attitude toward epilepsy to achieve these goals [11,12]. Simulation-based education is one of the most effective training methods that can provide students with epileptic seizure management knowledge, skills, and positive attitudes [11,12].

Simulation-based education provides students with the opportunity to do training, gain knowledge, make assumptions, and develop psychomotor skills in a safe and secure environment without risk [13]. Studies report that simulation is used in epileptic seizure management education for families with children with epilepsy. Parents of children with epilepsy who received traditional seizure training and additional simulation-based seizure training had higher epileptic seizure management performance and self-efficacy scores than those who received only traditional seizure teaching [11]. Similarly, simulation-based education on pediatric seizure management was shown to be useful for paramedics working in emergency departments [14]. However, to the best of the present author's knowledge, there are no studies on the effect of simulation-based education on nursing students' knowledge, skills, and attitudes in epileptic seizure management. This study, therefore, aimed to examine the effect of education given to nursing students training to be future healthcare professionals that involved simulation and standard child mannequins on their childhood epileptic seizure management knowledge, skills, and attitudes.

2. Material and methods

This was a quasiexperimental, randomized controlled study with a pretest–posttest design. The study population consisted of 87 third-year students enrolled in the Child Health and Diseases Nursing Program in the 2017–2018 academic year. Out of these 87 students, there were seven who refused to participate in the study. Therefore, the study sample consisted of 80 students who were randomly selected using the random sampling method. The randomization list was concealed from both researchers and students and was given to the researchers in the R version 3.1.3 package program by a third party during the application [15,16]. Forty of the 80 students were assigned to the intervention group and 40 to the control group. However, the study was completed with 72 students, after it was found that seven students did not fully complete the data collection forms while one student did not want to perform the intervention after receiving the training and therefore withdrew from the study (Fig. 1).

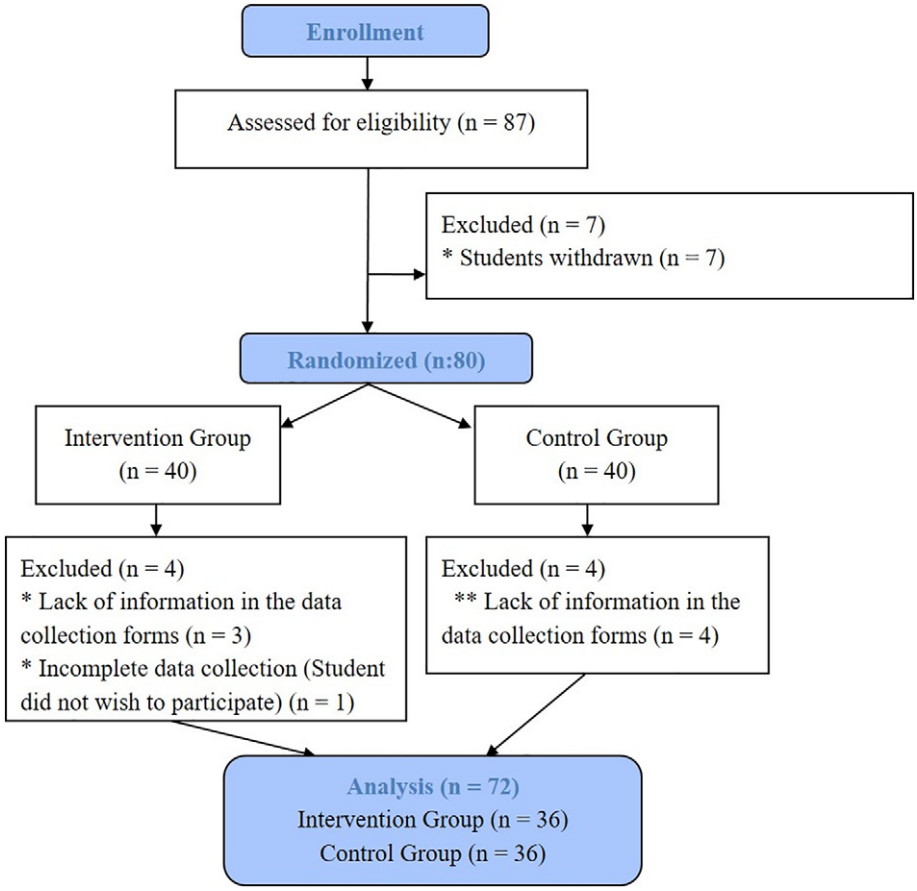

Fig. 1. Selection of the study participants.

2.1. Data collection tools

2.1.1. Personal information form

This form was developed by the researchers in line with the literature. It consisted of questions about the students' demographic characteristics (age, gender, school, place of residence, etc.).

2.1.2. Epilepsy and Epileptic Seizure Management Knowledge Test

This test consisted of 12 "Yes–No–I do not know" questions about epileptic seizure management. The questions not included on the Epilepsy Knowledge Scale were included in this test. The content validity of the test was evaluated by 10 faculty members from the child health and diseases nursing department. They were asked to score each item from 1 to 4 according to 1 = Not Very Suitable and 4 = Completely Suitable. The content validity index was used to evaluate expert opinions. The content validity index was 0.89. This test is valid in Turkish. The test was reviewed and finalized accordingly.

2.1.3. Epilepsy Knowledge and Attitude Scale

This scale was developed by Aydemir et al. and consisted of a total of 30 items, which included 16 items to measure the level of knowledge about epilepsy and 14 items to measure the attitude levels toward epilepsy. The knowledge scale is scored as follows: correct answer = 1 and wrong answer or no response = 0. Items 4, 11, 13, and 16 are reversed scored. Higher scores indicate higher levels of knowledge about epilepsy [17]. Responses on the attitude portion of the scale include the following: totally disagree = 5, disagree = 4, no idea = 3, agree = 2, and totally agree = 1. Items subjected to reverse scoring on the attitude scale are 3, 7, and 12. Higher scores indicate a more positive attitude toward epilepsy [17].

2.1.4. List of epileptic seizure management skills

This list was originally prepared by Gözen et al. and further developed by adding more items in line with the literature [18,19]. The list included the following skills: emergency evaluation and intervention, maintaining emergency care management, administering drugs, providing support to the family, and recording. Skills were evaluated as "insufficient", "should be developed", and "sufficient".

2.1.5. Clinical scenario and educational material

The clinical scenario prepared for epileptic seizure management included the patient's seizure history at home, type of transfer to hospital, emergency room follow-up notes, laboratory and vital signs, and the physician's prescribed medication. The scenario was used to evaluate the students' abilities to keep the patient's airways open to ensure that they remain conscious, to administer drugs safely, to maintain eye contact with the patient at an affective level, to maintain effective communication with the patient and their relatives, and to have positive attitudes toward the patient and their family. The scenario was also used to evaluate students' psychomotor skills and included evaluation of vital findings, administration of oxygen therapy, insertion of nasogastric (NG) tube, and administration of drugs.

The standard child mannequin (Kyle 3-year cardiopulmonary resuscitation mannequin) used in the study featured IV (intravenous) intervention areas and a NG/OG (orogastric) intervention area.

It includes a single-use airway system including an airway section, independent mouth/nose pieces and a breathing valve, and a NG/OG intervention area.

On the other hand, the simulation mannequin (S300.105 Code Blue III 5-Year Advanced Life Support Training Simulator) used in the study included a number of additional important features, such as patient follow-up on the monitor, airway sounds and vocal responses, bag-valve-mask ventilation, visible vocal cords, dead tilt-chin lift and jaw thrust, oral/nasal intubation, intubation depth detection, preprogrammed speech responses, bilateral lung expansion, unilateral chest movements, bilateral lung sounds, programmable chest movements, spontaneous breathing and pulses, IV training arm, oximeter sensor placement detection, palpable umbilical pulse, blood pressure auscultation, visible cyanosis, chest compression and ventilation performance sensors, defibrillator and pacemaker using real medical devices, heart-lung sounds, 4-lead ECG (electrocardiography) using real medical equipment, palpable anatomical landmarks, including ribs and xiphoid process, articulated neck, jaw, arms and legs, and oral intubation. It included Uni tablet PC upgrade and virtual patient monitor provides real-time feedback on simulation. There are convulsion and epileptic seizure scenario in the monitor, and all parameters can be changed.

2.2. Data collection

The data were collected in the simulation laboratory of the Faculty of Nursing. The laboratory was set up to suitably reflect a pediatric emergency setting and therefore included the basic life support materials, such as patient file, sickbed, airway, Ambu-brand medical equipment, and intubation tube, that should be present in a pediatric emergency clinic and that are expected to be used by students during convulsion intervention. Other necessary materials, like bedside monitor, oxygen saturation device, thermometer, oxygen mask, representative injector with sedative drug, cushion-like supporting materials to support the patient's body, and a telephone to communicate with the physician, were prepared and placed in the laboratory.

A nurse educator was assigned as the "Moderator/Facilitator" to ensure that the students were familiar with the setting and materials before the application, and to solve any problems they encountered, without interfering in the scenario.

The study was conducted after the necessary permissions were obtained from the Scientific Research and Publication Ethics Committee (IRB (Institutional Review Board) number: E.60224, Approval date: 27.02.2018, Protocol number: 446-2018). The students were informed about the study before starting it, after which their verbal and written informed consent was obtained. They were further provided with information about the expectations during the education process.

In the educational presentation, the students in both groups were also informed about epileptic seizures, etiology and pathophysiology, clinical signs and symptoms, and medical treatment types used in epileptic seizure management, as well as about how to perform a physical evaluation of the child to ensure proper epileptic seizure management, how to keep the airways open, how to ensure environmental safety, how to provide emotional support to the child and their relatives, and how to guide the child and their parents for care at home. In addition, they watched three videos about different types of epileptic seizures. After they were provided with necessary information, the training was started using the simulation and standard child mannequins.

The personal information form, the Epilepsy and Epileptic Seizure Management Knowledge Test, and the Epilepsy Knowledge and Attitude Scale were administered before the training. Later, the students were trained by 3 instructors using the epileptic seizure management scenario. Via the role-play method, proper epileptic seizure management was explained to the students in the control group on a standard child mannequin and to those in the intervention group on a simulation child mannequin. After completing the role-play, each student was asked to perform nursing approaches and interventions for epileptic seizure management on the same scenario with the mannequins, and each student was given an extra 30 min–1 h to practice on the mannequins. The data collection process started one week after completion of the educational training. The same scenario was used to make a standard evaluation for all students. This evaluation involved two observers, whom students did not see, being placed in the observation room and independently evaluating each student according to the list of epileptic seizure management skills. At the end of the educational training, an analysis phase was initiated to evaluate whether the students who received simulation-based educational training could transform their

Table 1
Demographic characteristics and personal experience with epilepsy.

Sociodemographic characteristics	Control group n (%)	Intervention group n (%)
Gender		
Female	30 (80.6)	33 (91.7)
Male	6 (19.4)	3 (8.3)
CGPA	2.71 ± 0.37	2.82 ± 0.42
Do you know or have you ever known anyone with epilepsy?		
Yes	3 (8.3)	0
No	33 (91.7)	36 (100)
Have you ever seen anyone having an epileptic seizure?		
Yes	11 (30.6)	14 (38.9)
No	25 (69.4)	22 (61.1)
Have you ever cared for anyone having an epileptic seizure?		
Yes	3 (8.3)	3 (8.3)
No	33 (91.7)	33 (91.7)
Have you ever received any education in patient care of epileptic seizures?		
Yes	19 (52.8)	19 (52.8)
No	17 (47.2)	17 (47.2)
Do you think you have received sufficient education on epilepsy and epileptic seizure management in undergraduate education?		
Yes	5 (13.9)	6 (16.7)
No	31 (86.1)	30 (83.3)
Do you think this education you received in the project is adequate?		
Yes	31 (86.1)	34 (94.4)
No	5 (13.9)	2 (5.6)
Total	36 (100)	36 (100)

theoretical knowledge into practice. In this context, the students were asked the following questions: "How did you feel during this simulation experience?", "Did you omit any interventions in your performance?", "What were the outcomes of this application for the patient?", and "What would you do differently if you were to repeat this application?". Their debriefings, which involved questions/feedbacks, were obtained. The Epilepsy and Epileptic Seizure Management Knowledge Test and the Epilepsy Knowledge and Attitude Scale were administered posttest after the educational training. After completion of the data collection process, the consistency between the evaluations of the educator nurses was examined by applying the interobserver agreement procedure.

2.3. Data analysis

The IBM SPSS (Statistical Package for the Social Sciences) 25.0 statistical program was used for statistical analyses, for which the significance level was considered 0.05. Numerical data were evaluated using mean, standard deviation, and median, minimum and maximum values while categorical data were evaluated using frequency and ratio values. The relationship between pre- and posttest knowledge test items was analyzed using McNemar's test. Pre- and posttest changes in knowledge and attitude scale total scores of the intervention and control groups (group effect, pre- and posteffect, interaction effect) were examined using the repeated measure ANOVA. Since the pre- and posttest changes were not found to be similar in the groups (interaction <0.05) according to the repeated measure ANOVA (intravenous), the pre- and posttest changes in each group were compared separately using the dependent t-test. Pearson's correlation analysis was used to examine the linear relationship between quantitative variables. The increase in intergroup pre- and posttraining self-confidence levels was analyzed using McNemar's test. Pearson's chi-square test was applied to compare the pre- and posttraining self-confidence (no–yes) ratios of the intervention and control groups while the intraclass correlation coefficient (ICC) was used to evaluate the agreement between observers.

3. Results

3.1. Demographic characteristics and personal experience with epilepsy

The mean age of the students was 21.91 ± 0.86 (Min: 20, Max: 25). There was a statistically significant difference between the groups with respect to gender, academic success (cumulative grade point average (CPGA)), having seen a person experiencing an epileptic seizure, providing care for a person who was experiencing an epileptic seizure, personal confidence that he/she has received sufficient educational training on epilepsy and epileptic seizure management during undergraduate education, and personal confidence that the educational training he/she received during the project was adequate ($p > 0.05$) (Table 1). Students from both groups felt that they had received adequate educational training in the project.

3.2. Knowledge test scores about epilepsy

An increase was observed in both groups' knowledge about epilepsy after the educational training. No statistically significant difference was found between the intervention group's pre- and posteducational training mean scores on the 10th item of the

Table 2
Knowledge test scores about epilepsy.

Knowledge item (T/F)	Percent of nurse students who responded correctly					
	Intervention group			Control group		
	Preeducation (%)	Posteducation (%)	p[a]	Preeducation (%)	Posteducation (%)	p[a]
1. Epilepsy is a disease that affects the neurological system (T)	97.2	100		94.4	100	
2. Epilepsy is a psychological/mental illness (F)	44.4	86.1	0.000	38.9	66.7	0.302
3. Epilepsy can be treated with psychological support (F)	33.3	83.3	0.006	36.1	72.2	0.180
4. A person having an epileptic seizure should be laid on his/her side to help them breathe comfortably (T)	72.2	100		83.3	100	
5. A person's tight clothes should be loosened during epileptic seizures (T)	94.4	100		97.2	97.2	1.000
6. The head of a child having an epileptic seizure should be examined (F)	44.4	94.4	0.006	33.3	77.8	0.021
7. An attempt should be made to stop muscle contraction due to epileptic seizure (F)	86.1	97.2	0.500	91.7	97.2	1.000
8. A person having an epileptic seizure should be given water or a drink (F)	94.4	100		94.4	100	
9. If the mouth of the child experiencing an epileptic seizure is locked, an attempt should be made to open it immediately (F)	61.1	88.9	0.109	77.8	80.6	0.219
10. After opening the jaw, a rolled up cloth should be placed in the patient's mouth (F)	8.3	97.2	0.000	19.4	77.8	0.001
11. Insomnia, stress, and hunger triggers epileptic seizures (T)	93.3	100		77.8	100	
12. People who have epileptic seizures do not lose consciousness (F)	69.4	100		63.9	86.1	

[a] McNemar's test; p values could not be calculated because the percentage of respondents in empty rows is 100%.

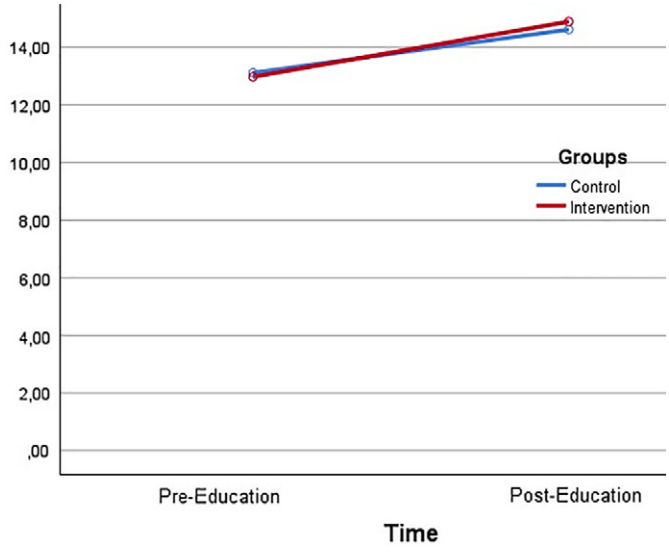

Fig. 2. Epilepsy knowledge status.

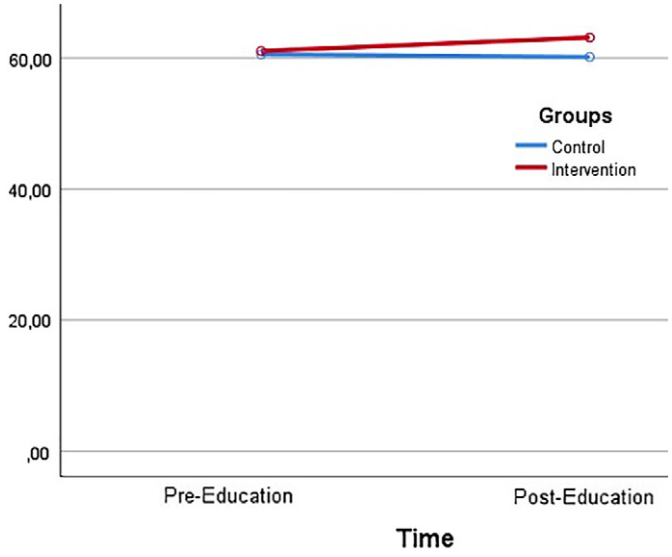

Fig. 3. Epilepsy attitude status.

knowledge test nor was there a statistically significant difference found between the control group's pre- and posteducational training mean scores on the 2nd, 3rd, 5th, 7th, and 9th items of the same test ($p > 0.05$) (Table 2).

The preeducational training mean score on the knowledge scale was 13.11 ± 1.68 for the control group and 12.97 ± 1.88 for the intervention group. The posteducational training mean score on the knowledge scale was 14.61 ± 2.04 for the control group and 14.88 ± 0.88 for the intervention group. The change in pre- to posteducational training mean scores on the knowledge scale was similar in both groups (interaction p value: 0.378). The increase in pre- to posteducational training mean scores on the knowledge scale was statistically significant for both groups ($p < 0.001$) but no significant difference was found between the groups (p: 0.829) (Table 2, Fig. 2).

The preeducational training mean score on the attitude scale was 60.52 ± 4.44 for the control group and 61.05 ± 6.44 for the intervention group. The posteducational training mean score on the knowledge scale was 60.13 ± 5.61 for the control group and 63.11 ± 5.82 for the intervention group. Therefore, the comparison of the change in pre- to posteducational training mean scores on the knowledge scale was performed using the dependent t-test separately in each group. Accordingly, the increase from pre- to posteducational training mean scores on the knowledge scale was statistically significant for the intervention group (p: 0.008) but not statistically significant for the control group (p: 0.630) (Table 3, Fig. 3).

The level of self-confidence in epileptic seizure management significantly increased in both groups after the educational training ($p = 0.000$), with 55.6% of the students in the control group and 75% of the students in the intervention group who reported that they did not have self-confidence in epileptic seizure management before the educational training stating that their self-confidence increased after the education. There was no statistically significant difference between the groups with respect to the change from pre- to posteducational training self-confidence (no–yes) ratio ($p > 0.086$) (Table 4).

The ICC was determined in order to evaluate the agreement between two observers in terms of the expressions in the checklists. Accordingly, the agreement between the observers was significant and the degree of agreement was very good or excellent for most of the items. The agreement between observers was significant and the degree of agreement was moderate for item İ2 only (Table 5).

4. Discussion

Nursing education should provide nursing students with discipline-specific knowledge and high-level skills as well as foster appropriate attitudes in the students to cope with the complex environments in

Table 3
Comparison of the groups' Epilepsy Knowledge and Attitude Scale scores.

Groups	Epilepsy Knowledge Scale		Epilepsy Attitude Scale	
	Preeducation	Posteducation	Preeducation	Posteducation
	$\overline{X} \pm SD$	$\overline{X} \pm SD$	$\overline{X} \pm SD$	$\overline{X} \pm SD$
Control group (n = 35)	13.11 ± 1.68	14.61 ± 2.04	60.52 ± 4.44	60.13 ± 5.61
Intervention group (n = 35)	12.97 ± 1.88	14.88 ± 0.88	61.05 ± 6.44	63.11 ± 5.82
	p values*			
Group	p: 0. 829		p: 0.153	
Before–After	p < 0.001		p: 0.129	
Interaction	p: 0.378		p: 0.027	
	p values[a]			
Control group			p: 0.630	
Intervention group			p: 0.008	

X = Mean; SD = Standard deviation; * Repeated Measure ANOVA results.
[a] Dependent t test.

Table 4
Self-confidence about epileptic seizure management.

Self-confidence	Control group (n:36)			Intervention group (n:36)		
	Preeducation N (%)	Posteducation (%)	p[a]	Preeducation (%)	Posteducation (%)	p[a]
Yes	2 (5.6)	22 (61.1)	0.000	6 (16.7)	33 (91.7)	0.000
No	34 (94.4)	14 (38.9)		30 (83.3)	3 (8.3)	
No–yes		20 (55.6)			27 (75)	
n (%)			x^2: 2.928; p: 0.086[b]			

[a] McNemar's test.
[b] Pearson chi-square test.

hospitals [20]. Passive learning methods are a learning approach in which students listen to teachers passively. With the developing technology, however, active learning methods, based on problems and projects and supported by computers, models, and simulations, have been adopted [20,21]. In this study, the effectiveness of two active learning methods, simulation and standard child mannequins, was compared.

There are only a limited number of studies that have been conducted on the effect of epileptic seizure management and education. One study determined that a simulation-based education given to paramedics working in emergency service units improved their pediatric epileptic seizure management skills [14]. Eze et al., in their study, found that visual and auditory training given to preservice teachers about epileptic seizure management and first aid for epileptic seizures increased their knowledge about epilepsy and epileptic seizures [22]. Another study reported that simulation- and scenario-based training given to doctors and nurses working in epilepsy monitoring units increased their knowledge of epileptic seizure management [23]. The present study did not find a statistically significant difference between the groups' knowledge scale mean scores ($p > 0.05$); that is, both active learning methods were effective.

There was a statistically significant difference between the two groups' epilepsy attitude scale mean scores. Students who received the simulation-based education had more positive attitudes toward epilepsy, meaning that it developed the affective skills of the nursing students. Affective skills shape a person's behaviors, help them to understand their own feelings, empathize with others and manage their own emotions, and enable them to establish good interpersonal relationships, to cope better with difficult situations, to have a sense of self-efficacy, and to develop positive attitudes [24]. Studies report that it is difficult to foster affective skills in students [25]. The present study found that students in the intervention group exhibited some important affective skills during the training process, including establishing eye contact, communicating with the patient and his/her relatives, and showing a positive attitude toward the patient and his/her family. In addition, students who received the simulation-based training were able to monitor physiological outcomes of their interventions on both the patient and the computer screen, an accomplishment that developed their problem-solving skills and ability to recognize their own feelings. Similarly, Eze et al. determined that the visual and auditory training positively affected the attitudes of preservice teachers toward epilepsy [22].

One of the most important gains of simulation-based training is self-confidence. Studies have shown that simulation-based training increases self-confidence in nursing students [26–29]. There are only a limited number of studies that have investigated the relationship between epileptic seizure management education and self-confidence. The present study observed that self-confidence increased in both groups after the training and that there was no statistically significant difference between the groups. Dworetzky et al., however, found in their study that the simulation- and scenario-based training given to doctors and nurses working in epilepsy monitoring units did not affect their self-confidence in epileptic seizure management [23]. A study on epileptic seizure management involving families determined that parents who received simulation-based training had higher self-efficacy and, therefore, self-confidence in epileptic seizure management [11]. It is recommended that more studies be conducted to further understand how to transform cognitive, psychomotor, and affective skills into a sense of self-confidence regarding the management of epileptic seizures and to provide continuous training to both students and graduate nurses on this subject.

Table 5
The agreement of the two observers by variables — intraclass correlation coefficients.

Variables	ICC	p
Emergency evaluation and intervention (EE)		
EE1. Establishing a safe environment	0.946	0.000
EE2. Keeping the airways open	0.906	0.000
EE3. Applying a jaw pushing-forward maneuver to relieve airway obstruction due to muscle contraction	0.925	0.000
EE4. Removing secretions and taking tools for aspiration to bedside	0.980	0.000
EE5. Giving oxygen	0.922	0.000
EE6. Monitoring vital signs	0.996	0.000
EE7. Evaluating level of consciousness	0.965	0.000
EE8. Informing/calling physicians and other health professionals	0.951	0.000
Maintaining emergency care management (ECM)		
ECM1. Establishing/maintaining IV vascular access for drug and fluid intake	0.889	0.000
ECM2. Maintaining IV vascular access	0.917	0.000
ECM3. Checking blood glucose level	0.932	0.000
ECM4. Applying nasogastric catheter against the risk of vomiting and aspiration	0.968	0.000
ECM5. Protecting the child from injury and trauma	0.936	0.000
ECM6. Maintaining thermoregulation	0.879	0.000
Drug administration (D)		
D1. Administering prescribed medications to stop convulsions (administering rectal diazepam and holding together the gluteal muscle for a few minutes to prevent leakage)	0.951	0.000
D2. Keeping the tools/equipment necessary for intubation and ventilation available, since intensive drug administration may cause apnea	0.690	0.000
Support for the family (FS)		
FS1. Informing the family about the child's health condition	0.933	0.000
FS2. Supporting the family	0.948	0.000
Recording (R)		
R. Recording all details of epileptic seizure and nursing practices from beginning to end of the seizure (presence of aura, type of seizure, duration of seizure (in min(s)), presence of urine/stool incontinence etc.)	0.980	0.000

ICC: Intraclass correlation coefficient; IV: intravenous.

5. Limitations

The simulation mannequin used in the study did not have the feature of simulating epileptic seizures. Therefore, the students in both groups watched videos of children who were having epileptic seizure.

If the simulation mannequin used in the study had the feature of simulating epileptic seizures, it is possible that the students would have had higher knowledge and attitude scale scores. Nevertheless, the simulation mannequin used in the study enabled the students to apply all medical interventions to the child patient and to monitor physiological changes in the patient during the interventions on both the mannequin and the screen.

6. Conclusion

Developing affective field skills in nursing education is very important. Simulation-based training is an educational method that allows students to confront their own emotions. This is the first study conducted to evaluate the value of using simulation-based training to improve nursing students' epileptic seizure management knowledge and attitudes. The students who received with simulation-based training were able to analyze the physiological results better than the monitor and simulator. This improved their problem-solving skills and self-confidence. Simulation-based education supported the students in developing positive attitudes toward epilepsy. The results support that simulation-based education should be included as part of the nursing curriculum to improve nursing students' cognitive, psychomotor, and affective skills.

Declaration of competing interest

No competing financial interests to declare.

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