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The Effect of Scenario-Based High Fidelity Simulation Training on Autonomy Levels, Team Collaboration and Problem Solving Ability of Last Grade Nursing and Medical Students: Experimental Study

Senaryo Temelli Yüksek Gerçeklikli Simülasyon Eğitiminin Son Sınıf Hemşirelik ve Tıp Öğrencilerinin Ekip İş Birliği, Problem Çözme Becerisi ve Otonomi Düzeyine Etkisi: Deneysel Çalışma

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ABSTRACT Objective: The aim of this study is to determine the effect of scenario-based High-Fidelity Simulation (HFS) training on the level of team cooperation, problem solving skills and autonomy of senior nursing and medical students. **Material and Methods:** This research was carried out in the pre-post-test single-group experimental design model, at the Simulation Center. The sample of the study consisted of a total of 210 students studying in the last year of the faculty of health sciences, department of nursing (105) and faculty of medicine (105). Within the scope of the research, a total of 35 groups were formed in groups of 6 students. Each week, the training of a group was carried out in a total of 7 stages over 2 consecutive days. The study was carried out with a multidisciplinary team. **Results:** In the study, it was found that before the simulation training, the nursing students' attitude towards physician-nurse cooperation was more positive and their problem-solving skills were higher, but after the training, the positive attitudes of the medical students towards physician-nurse cooperation and their problem-solving skills increased, the autonomy level of the nursing students was lower before the simulation training, but the training It was found that thereafter it increased. After the simulation training, both nursing and medical students reported that they found the scenario applied to them sufficient and important in the training process. **Conclusion:** It has been concluded that with an effective scenario and a HFS training, the team cooperation, problem-solving skills and autonomy level of nursing and medical students can be increased.

Keywords: High-Fidelity Simulation training; nursing students; medical students; problem solving; professional autonomy

ÖZET Amaç: Bu çalışmanın amacı, senaryo temelli Yüksek Gerçeklikli Simülasyon (YGS) eğitiminin son sınıf hemşirelik ve tıp öğrencilerinin ekip iş birliği, problem çözme becerisi ve otonomi düzeyine etkisini belirlemektir. **Gereç ve Yöntemler:** Bu araştırma, ön-son test tek gruplu deneysel desen modelinde ve Simülasyon Merkezi'nde gerçekleştirilmiştir. Araştırmanın örneklemini, sağlık bilimleri fakültesi hemşirelik bölümü (105) ve tıp fakültesi (105) son sınıfında öğrenim gören toplam 210 öğrenci oluşturmuştur. Araştırma kapsamında, altışar kişilik gruplar hâlinde toplam 35 grup oluşturulmuştur. Her hafta bir grubun eğitimi ardışık 2 gün içinde toplam 7 aşamalı bir süreçte gerçekleştirilmiştir. Çalışma multidisipliner bir ekiple gerçekleştirilmiştir. **Bulgular:** Araştırmada, simülasyon eğitimi öncesinde hemşirelik öğrencilerinin hekim-hemşire iş birliği tutumunun daha pozitif ve problem çözme becerilerinin daha yüksek olduğu, ancak eğitim sonrasında tıp öğrencilerinin hekim-hemşire iş birliğine yönelik pozitif tutumlarının ve problem çözme becerilerinin arttığı, simülasyon eğitimi öncesinde hemşirelik öğrencilerinin otonomi düzeyinin daha düşük olduğu, ancak eğitim sonrasında arttığı sonucuna ulaşılmıştır. Simülasyon eğitimi sonrasında hem hemşirelik hem de tıp öğrencileri kendilerine uygulanan senaryoyu eğitim sürecinde yeterli ve önemli bulduğunu bildirmiştir. **Sonuç:** Etkili bir senaryo ve YGS eğitimi ile hemşirelik ve tıp öğrencilerinin ekip iş birliği, problem çözme becerisi ve otonomi düzeyinin artırılabileceği sonucuna ulaşılmıştır.

Anahtar Kelimeler: Yüksek Gerçekli Simülasyon uygulamaları; hemşirelik öğrencisi; tıp öğrencisi; problem çözme; profesyonel otonomi

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One of the main problems in nursing and medical education is that the student cannot appropriately transfer the theoretical knowledge he/she possesses to clinical practice.[1-3] In this sense, applied education in health disciplines is one of the vital fundamental elements of education. It is aimed for the student to learn by doing/living in real or realistic environments.[4] Today, the requirement to utilize technological facilities in the formation of students for clinical practice in a risk-free environment in health education has stood out.[1]

Scenario-based High-Fidelity Simulation (HFS) applications can provide students with the highest level of experience by repeating, making mistakes and learning from mistakes in a safe environment without harming the patient.[3,5] At this point, teaching with HFS allows students to establish a secure link between theory and practice and to build a student-centered learning environment.[1,6] In the literature, it is stressed that the use of simulation education in the field of health provides an increase in students' self-confidence and an improvement in their psychomotor skills.[5,7,8] Besides, it is stated that simulation training stimulates the clinical decision-making process develop critical thinking and empowers team collaboration in physicians and nurses who provide healthcare to human beings.[4,9-11]

Human beings are multidimensional, and their needs are so versatile. Thus, the service provided to him must be versatile. It requires a multidisciplinary approach and teamwork in health services.[4,12] In the studies conducted, it has been reported that the members recognize each other's roles and positions better, solve problems better.[2] The synergy within the team has positive reflections on patient outcomes and employees' job satisfaction and performance.[4]

In recent years, there are many studies in the literature emphasizing the importance and necessity of simulation method in the education of health professionals. However, no review has been found to evaluate and develop the problem solving and autonomous decision-making skills of nursing and medical students in a team. In this context, this study was carried out for the first time with an interdisciplinary team and considered to provide an essential scientific basis for the restructuring of the current curriculum. Besides, it was handled to determine the effect of scenario-based HFS method on senior year nursing and medical students' level of team collaboration, problem-solving skills and autonomy.

This study sought answers to the following research questions:

Nursing and medical students studying with scenario-based HFS training;

1. Is there a difference between the pre-test and post-test mean scores for team collaboration?

2. Is there a difference between the pre-test and post-test mean scores for problem solving skills?

3. Is there a difference between the pre-test and post-test mean scores for the autonomy level?

4. Is there a difference between the average scores for certain features and importance of the scenario applied to them?

5. Is there a relationship between team collaboration, problem solving and autonomy score averages of nursing and medical senior students who received scenario-based HFS education?

MATERIAL AND METHODS

DESIGN AND SETTING

This research is an experimental study and also planned in the pre-post test single group. The research was carried out in the Simulation Center, which was jointly established by the Faculty of Health Sciences and the Faculty of Medicine of a university in one of the major cities in the Central Anatolia Region of Türkiye and became operational in November 2015. In the Simulation Center, a patient unit is equipped with Gaumard brand HAL S3201 (Gaumard Hal US & Canada) Intensive Care and Advanced Life Support Simulator and video recording system, and the necessary equipment for treatment and care, as well. A team of 5 responsible for the coordination of this center has undertaken the educational activities to be carried out in the Simulation Center. The members of this team are also the researchers of this study and have the "Introduction to SimMan Essential Course" and "Gaumard brand HAL S3201 model Intensive Care and Advanced Life Support Simulator User Training Course" Training

Certificate by Gunner Svedenlund, European Middle East and Africa Training Services Specialist at Laerdal Medical.

SAMPLE

The population of the study consisted of final year students of the faculty of health sciences (250) and faculty of medicine (200) in the fall and spring semesters of the 2016-2017 academic year. The sample size of the study was calculated as 210 students at a confidence interval of 0.95 with 0.05 error and power analysis. In order to ensure equal representation in the groups, 105 nursing and 105 medical students were included in the sampling. In this context, a total of 35 groups of 3 senior nursing and 3 senior medical students were formed in groups of six. The students are included in the study voluntarily. In case the number of volunteers exceeded the specified amount, the required number of students was included in the study by the simple random sampling method.

STUDY INSTRUMENTS

Personal Information Form, Jefferson Physician-Nurse Cooperation Attitude Scale, Problem Solving Inventory (PSI), Autonomy Subscale of Sociotropy-Autonomy Scale (SAS) and Simulation Design Scale (SDS) were used in data collection.

PERSONAL INFORMATION FORM

This form contains demographic and introductory information, consisting of 7 questions to determine the student's age, gender, education level of his parents. Besides, willingly choosing his profession, loving his profession and feeling himself belonging to his profession were questioned.

JEFFERSON SCALE OF ATTITUDES TOWARD PHYSICIAN-NURSE COLLABORATION

Jefferson Scale of Attitudes Toward Physician-Nurse Collaboration (JSAPNC) was developed by Hojat and Herman as 20 items and later Hojat et al., it was reduced to 15 items by conducting a validity and reliability study again. The purpose of this measurement tool is to measure the cooperation of physicians and nurses. In the validity and reliability study conducted with medical and nursing students, the Cronbach alpha reliability coefficient of the original scale was found to be 0.84 in medical students and 0.85 in nursing students. JSAPNC is a 4-point Likert-type scale scored from 1 to 4 (Strongly Agree=4, Agree=3, Disagree=2, Strongly Disagree=1). The scale has 4 sub-dimensions: "Joint Education and Teamwork", "Care versus Treatment", "Nurse Autonomy" and "Physician Dominance."[13] In our country, the Turkish validity and reliability study of the scale was carried out by Yildirim et al. with medical school and nursing school students, and the Cronbach alpha reliability coefficient was found to be 0.71 and 0.75 in both groups, respectively.[14] The lowest score that can be obtained from the scale is 15 and the highest score is 60. The 8th and 10th statements in the scale are reverse scored. In our study, the Cronbach alpha reliability coefficient of the scale was found to be 0.79.

SAS

The scale was developed by Beck et al.[15] It was adapted into Turkish by Sahin et al.[16] The SAS consists of 60 items, 30 items belong to the Sociotropy Sub-Scale and 30 items belong to the Autonomy Sub-Scale (ASS). ASS was used in our study. The ASS measures dependent and autonomous personality traits. The ASS has 3 sub-dimensions: "Personal Achievement", "Freedom" and "Enjoying Solitude." The original and Turkish reliability of the scale were found to be 0.81 and 0.80, respectively. The Autonomy Sub-Scale is a 5-point Likert-type measurement tool in the form of 0 (Not at all), 1 (Slightly), 2 (Very Good), 3 (Good), 4 (Very Good), showing to what extent an individual defines his/her personality in terms of dependency and autonomy. The highest score obtained from the scale is 120 and the lowest score is 0. A high score indicates a high level of autonomy. In our study, the Cronbach alpha reliability coefficient of the scale was found to be 0.82.

PSI

The scale was developed by Heppner and Peterson.[17] PSI is a scale that evaluates how people think about their problem-solving behaviors and approaches. The scale consists of 35 items in 6-point Likert type. Scale items; it is scored as 1 (Totally Agree), 2 (Partly Agree), 3 (Somewhat Agree), 4 (Somewhat Disagree), 5 (Partly Disagree), 6 (Totally Disagree). The

lowest 32 and the highest 192 points are obtained from the scale. A low score indicates effectiveness in problem solving and behaviors and attitudes related to successful problem solving. A high score indicates the inability to find effective solutions to problems. The scale has 3 sub-dimensions as "Confidence in Problem Solving Ability", "Approach Avoidance Style" and "Personal Control." The Turkish validity and reliability study of the scale was conducted by Savaşır and Şahin Cronbach's alpha reliability coefficients of the original and Turkish scales found to be 82 and 0.88, respectively.[18] In our study, the Cronbach alpha reliability coefficient of the scale was found to be 0.83.

SDS

The validity and reliability study of this measurement tool was carried out by Jeffries & Rizzolo (2006). The SDS is a 20-item measurement tool. The scale has 5 sub-dimensions: "Targets and Information", "Support", "Problem Solving", "Feedback/Guided Reflection", "Fidelity Degree/Reality." This scale consists of 2 parts graded in 2 separate 5-point Likert types. While the first part is aimed at evaluating the existence of certain features in the scenario (1: I strongly disagree with the statement, 5: I strongly agree with the statement), the second section is aimed at revealing the importance of these features for the individual (1: not important, 5: very important). The Cronbach's alpha values for these 2 parts of the scale are 0.92 and 0.96, respectively. The validity and reliability study of the Turkish version of the scale was conducted by Unver et al.[19] The Turkish version of the scale has 5 sub-dimensions, as in the original scale, and the Cronbach's alpha value for both parts is 0.73-0.86, respectively. The scale is filled in by the students themselves. High scores from the scale indicate high recognition of simulation design features. In our study, the Cronbach alpha reliability coefficient of the scale was found to be 0.83-0.85.

PROCEDURES

Within the scope of the research, one group was trained every week and the data were collected in a 7-stage process in 2 consecutive days. "Approach to the patient with myocardial infarction" was applied to the students with the HFS method. This scenario was prepared under the consultancy of the cardiologist, also the project advisor. The learning objectives of the simulation training applied in this study for students are; (1) the ability of team members to evaluate the findings by conducting cardiovascular system and respiratory system examination in a qualified cooperation, (2) to be able to evaluate the result by taking electrocardiography (ECG), (3) the ability to monitor the patient and evaluate the monitor findings, (4) being able to evaluate life signs throughout the process, (5) ability to evaluate hypoxia, (6) the ability to give the patient a suitable position, to create a safe environment, (7) being able to comfort the patient, (8) being able to take blood sample by opening vascular access, (9) ability to administer medication and fluid therapy, (10) being able to place a foley catheter in the patient's bladder and to follow up his extraction, (11) ability to reduce fear and anxiety, (12) being able to monitor the general condition of the patient and to evaluate his subjective data, (13) being able to decide and initiate cardioversion, (14) being able to intubate the patient and (15) being able to perform cardiopulmonary resuscitation in a way that is 15:2.

PROCEDURE STEPS

Before starting the study, at the beginning of the fall semester of the 2016-2017 academic year, the students included in the study were given a conference on ECG evaluation (2 hours) and diagnosis-treatment (3 hours) in myocardial infarction (MI) by the project consultant, who is a cardiologist. Besides, a conference was given by the project coordinator researcher on nursing care (2 hours) in MI. The conference was videotaped, and the video recording was given to students to watch whenever they wanted. After that, the training days of 35 groups of 6 people were determined and the implementation schedule was given to the groups. On the first day of each group, as the first step of the training, a confidentiality agreement was signed with the students concerning the simulation information of the laboratory environment and all simulation training practices. Then, in the second stage, the Personal Information Form was applied to the students, and JSAPNC, ASS

and PSI were employed as the first test. As the third stage, the students were given a physical examination, vital signs, IV cannula and medication administration, ECG, and monitoring the patient on the simulator for about an hour to adapt to the environment, the equipment in the environment was introduced, the students' questions were answered and the first day was completed.

On the second day, as the fourth step of the first 15 minutes of training, the student group was prebriefed concerning the patient's health history and current situation. Then, as the fifth step, the approach scenario to the patient with MI was applied for 30 minutes. After the scenario was applied, the debriefing session was held in the 6th stage. After the debriefing session, at the seventh stage, JSAPNC, ASS, PSI and SDS were applied as a post-test to the students.

A total of 5 researchers took part in the laboratory team during the research process. One of these researchers was in the role of a patient relative to the scenario besides the simulator, 2 researchers were in the control room, 1 researcher was responsible for guiding and coordinating the students from the first admission to the simulation center to the application stages throughout the entire education process, and one researcher as a facilitator. The facilitator cooperated with the control room during the application and was responsible for taking notes about the applications, monitoring the students during the application and performing the debriefing phase at the end of the application.

ETHICAL CONSIDERATIONS

Before the initiation of the study, Cumhuriyet University Faculty of Medicine's Clinical Studies Ethics Committee's approval (date: March 25, 2016, no: 2016-03/29) was taken and written permission of related institutions. This study was conducted in accordance with the principles of Declaration of Helsinki. Upon informing the participant students and taking written permission form from them, the data was gathered by researches.

EVALUATION OF THE DATA

SPSS 22.00 (IBM Corp., Armonk, NY, USA) program was used for the statistical analysis of the data. In group comparisons, the significance test of the difference between the spouses (t-test for dependent groups); when comparing parameters between groups, the significance test of the difference between 2 means in independent groups (t-test in independent groups), chi-square, variance analysis and correlation analysis were used. The level of error (α) was taken as 0.05.

RESULTS

While the average age of the nursing students included in the study is 21.91±1.032 and 89.5% are women, the average age of the medical students is 24.21±1.39 and 53.3% are male (Table 1).

While the physician-nurse cooperation attitude of the nursing students (51.55±4.01) before the simulation training was statistically significantly more positive (t=6.60; p=0.001) than the medical students (47.66±4.60), the positive attitude of the medical students after the training (50.91±5.14) and reached the same level with nursing students (50.69±4.82) without a statistically significant difference (t=0.32; p=0.744). When the student groups were compared within themselves, the physician-nurse cooperation attitude of the medical students after the training compared to the pre-simulation training showed a statistically significant (t=5.23; p=0.001) positive development (Table 2).

Before the simulation training, the autonomy level of the nursing students (72.73±16.66) was statistically significantly lower (t=6.60; p=0.001) than the medical students (80.02±17.20), after the training, the level of autonomy increased (75.69±18.20) and approached medical students (78.87±16.73) without a statistically significant difference (t=1.32; p=0.186). When the student groups were compared within themselves, the autonomy level of the nursing students increased after the training compared to the pre-simulation training. In contrast, that of the medical students decreased (Table 2).

Before the simulation training, the problem solving level of nursing students (95.50±16.09) was found to be statistically significantly higher than medical students (87.79±15.00) (t=3.63; p=0.001). However, with the statistically significant (t=2.92;

TABLE 1: Demographic characteristics of medical and nursing students.

	Nursing student number (%)	Medical student number (%)	Total number (%)
Age average	21.91±1:03	24.21±1.39	23:06±1.21
Gender			
Female	94 (89.5)	49 (46.7)	143 (68.1)
Male	11 (10.5)	56 (53.3)	67 (31.9)
Mother's level of education			
Illiterate	5 (4.7)	1 (1.0)	6 (2.9)
Literate	7 (6.6)	4 (3.8)	11 (5.2)
Primary school	57 (54.3)	34 (32.4)	91 (43.3)
Secondary education	30 (28.6)	31 (29.5)	61 (29.0)
Associate degree	3 (2.9)	9 (8.6)	12 (5.7)
Bachelor's degree	3 (2.9)	24 (22.8)	27 (12.9)
Postgraduate	0 (0)	2 (1.9)	2 (1.0)
Father's level of education			
Illiterate	5 (4.8)	6 (5.7)	11 (5.2)
Literate	8 (7.6)	2 (1.9)	10 (4.8)
Primary school	35 (33.3)	11 (10.5)	46 (21.9)
Secondary education	44 (41.9)	34 (32.4)	78 (37.1)
Associate degree	5 (4.8)	9 (8.6)	14 (6.7)
Bachelor's degree	8 (7.6)	35 (33.3)	43 (20.5)
Postgraduate	0 (0)	8 (7.6)	8 (3.8)

TABLE 2: Comparison of nursing and medical students' mean scores of the Jefferson Scale of Attitudes Toward Physician-Nurse Collaboration, Problem Solving Inventory, Autonomy Scale, and Simulation Design Scale.

Scales	Nursing student X±SD	Medical student X±SD	*Statistical result
HHİS pre-test	51.55±4.01	47.66±4.60	t=6.60
			p=0.001
HHİS post-test	50.69±4.82	50.91±5.14	t=0.32
			p=0.744
Statistical result	t=1.59	t=5.23	
	p=0.114	**p=0.001**	
OAÖ pre-test	72.73±16.66	80.02±17.20	t=3.14
			p=0.002
OAÖ post-test	75.69±18.20	78.87±16.73	t=1.32
			p=0.186
**Statistical result	t=1.52	t=0.54	
	p=0.129	p=0.587	
PSI pre-test	95.50±16.09	87.79±15.00	t=3.63
			p=0.001
PSI post-test	90.01±16.85	92.25±20.02	t=0.88
			p=0.378
Statistical result	t=3.83	t=2.92	
	p=0.001	**p=0.004**	
SDS/scenario features	90.03±10.73	89.24±13.84	t=0.46
			p=0.638
SDS/severity	93.70±8.50	93.25±8.06	t=0.39
			p=0.692

*Statistical analyzes at the end of the line reflect the results of the comparison between the groups; **Intra-column statistical analyzes reflect within-group comparison results; JSAPNC: Jefferson Scale of Attitudes Toward Physician-Nurse Collaboration; PSI: Problem Solving Inventory; AS: Autonomy Subscale; SDS: Simulation Design Scale.

p=0.004) increase in the problem solving level of medical students after the training (92.25±20.02), the problem solving levels of both groups approached each other and there was no statistically significant difference between the groups (t=0.88; p=0.378) was detected. When the student groups were compared within themselves, the problem solving level of nursing students after simulation training decreased statistically significantly (t=3.83; p=0.001), while that of medical students statistically increased (t=2.92; p=0.004) (Table 2).

When the mean scores of the SDSs applied after the simulation training were examined, both nursing (90.03±10.73) and medical students (89.2±13.84) had specific characteristics of the scenario referred to them (goals-knowledge, support, problem-solving, feedback/guided reflection, degree of fidelity to the original/realism) and these features are highly essential for them to (nursing students X=93.70±8.50; medical students X=93.25±8.06). There was no statistically significant difference between the mean scores of both groups regarding the specific features and importance of the scenario applied (p>0.05 (Table 2).

A weak but statistically significant correlation was found between the mean scores of JSAPNC, PSI and SDSs, which were used as data collection tools in the study (p<0.05), the scenario was perceived as significant when the scenario features applied in the simulation education were found to be sufficient by the students (r=0.359; p=0.001), it was found that when students' team collaboration attitude increased, their problem-solving skills increased (r=-.295; p=0.001) and team collaboration attitude increased (r=0.233; p=0.001) as the scenario applied was considered important by the students (Table 3).

DISCUSSION

In our study, it was found that nursing students' physician-nurse cooperation attitude was more positive than medical students before the simulation training. In contrast, the positive attitude increased in medical students after the training (Table 2). In line with this finding, it is thought that the high-fidelity simulation method, which has not been used in traditional medicine and nursing education before, is effective in providing both groups of students with the opportunity to work together and collaboratively in a safe learning atmosphere in the same environment. In parallel with this finding, it can be said that the understanding of team cooperation in both medical and nursing students in the education process forms the basis for a strong communication and cooperation process in later professional life. Akbal

TABLE 3: Correlation Between the Nursing and Medical Students' Mean Scores of the Jefferson Scale of Attitudes Toward Physician-Nurse Collaboration, Problem Solving Inventory, Autonomy Scale, and Simulation Design Scale After the Simulation Training of Students.

	Jefferson Scale of Attitudes Toward Physician-Nurse Collaboration		Sociotropy-Autonomy Scale		Problem Solving Inventory		Simulation Design Scale (Scenario Features)		Simulation Design Scale (Severity)	
Post-test	**r value**	**p value**	**r value**	**p value**	**r value**	**p value**	**r value**	**p value**	**r value**	**p value**
Jefferson Scale of Attitudes Toward Physician-Nurse Collaboration			0.095	0.165	-0.295	**0.001**	0.062	0.364	0.233	**0.001**
Sociotropy-Autonomy Scale	0.095	0.165			-0.144	0.036	-0.021	0.766	-0.023	0.740
Problem Solving Inventory	-0.295	**0.001**	-0.144	0.036			-0.107	0.118	-0.109	0.113
Simulation Design Scale (Scenario Features)	0.062	0.364	-0.021	0.766	-0.107	0.118			-0.109	0.113
Simulation Design Scale (Severity)	0.233	**0.001**	-0.023	0.740	-0.109	0.113	0.359	**0.001**		

Ergun et al. to determine physician-nurse cooperation, it was determined that the professional cooperation between these 2 groups is weak.[20] In our study, the strengthening of the collaborative understanding between physicians and nurses, 2 important members of the health care team, with the HFS method is considered as a remarkable finding. In another study conducted with medical and nursing students, students stated that simulation is valuable in understanding team roles and that working together should be continuous for all nursing and medical students.[21] Furthermore, Klipfel et al. stated in their study that high-reality simulation based on general surgery-urology clinic scenarios increased group cohesion, cooperation and satisfaction in decision-making between working nurses and doctors.[22] In different studies dealing with interdisciplinary cooperation in health education, the importance and necessity of team collaboration was emphasized, it has been stated that scenario-based simulation training increases communication and cooperation between the healthcare team and strengthens the ability to manage complex situations.[3,6,23-25]

The simulation method in health education allows the student to make mistakes safely and to learn from these mistakes.[26-28] While the autonomy level of nursing students was lower before HFS training in our study, it increased after the training and approached the level of medical students (Table 2). In line with these findings, it can be assumed that the HFS method positively affects the autonomy of nursing students. It offers students the opportunity to manage themselves and the care services they will provide with a team understanding and is extremely important in their ability to exhibit autonomous behaviors. In our study, the fact that the post-simulation autonomy level of the medical students was lower than before the training was considered as a remarkable finding in terms of showing that they did not only make the decisions for the patient themselves, and they tended to joint decisions in line with the team understanding, and in this context, they gave the nursing students the opportunity to act more autonomously. Although there is no study examining the effect of simulation education on the autonomy level of nursing and medical students, it was determined in different studies conducted with nursing students that the simulation method increased students' self-confidence.[7,9,12]

Although there is no conclusion concerning medical students in the literature, it is stated that the HFS method contributes to the development of problem-solving skills of nursing students.[29-31] However, unlike the literature, in our study, it was determined that the problem solving skills of nursing students, which were higher before the simulation training, decreased after the training. However, it was determined that the problem solving skills of medical students, which were at a lower level before the simulation training, increased statistically significantly after the training (Table 2). In line with these findings, it can be assumed that the responsibilities of medical school students are more prominent due to drug therapy and invasive interventions required for the solution of urgent and complex health problems, and their problem-solving skills increase in this context.

In accordance with our research findings, it can be assumed that all interventions to be applied to the patient in solving complex health problems with the HFS method can be carried out with team cooperation and shared decisions. Nursing students can exhibit more autonomous behaviors, and medical students' problem-solving skills with a holistic perspective, far from paternalistic understanding, significantly strengthen.

It is essential to evaluate how the students perceive the scenarios and different simulation methods used in the simulation due to the increased interest in the use of simulation in health education and its widespread use in education. Simulation applications in education should be able to imitate all possible situations that exist in reality, and provide a rich learning environment in which the student can respond appropriately.[32] In this context, in our study, nursing and medical students stated that the scenario employed to them was highly sufficient in terms of objectives-knowledge, support, problem-solving, feedback/guided reflection, and the degree of fidelity/realism, and these features were highly essential for them to (Table 2). In line with these findings,

it can be assumed that students comprehend the scenario-based HFS method positively and are satisfied with this education method. Findings obtained from studies in which the HFS method was evaluated with the SDS in the literature generally support our study findings.[1,19]

In addition to the results obtained in the research, there are some strengths and limitations of the study. The strength of our study is that it is carried out with an interdisciplinary team and that it produces results that provide an important scientific basis for the restructuring of existing curricula. However, the findings of our study are limited to the time period in which it was conducted. In addition, the scale used to obtain the research data and the large number of items to be answered can be considered as a situation that may cause recall bias in the participants.

CONCLUSION

In line with the data obtained from the research; before the HFS training, nursing students held a more positive physician-nurse cooperation attitude and higher problem-solving skills. However, after the training, medical students' positive attitudes towards physician-nurse cooperation and problem-solving skills increased. The autonomy level of nursing students was lower before the simulation training, but after the training, it can be stated that it increases and approaches medical students.

In our study, medical and nursing students perceived the scenario-based HFS method positively and stated that they were satisfied with this training method. After the HFS training, both nursing and medical students reported that they found the scenario applied to them sufficiently and essential in their education process. In this context, it was concluded that with the HFS training conducted within the scope of an effective scenario, the level of team collaboration, problem-solving skills and autonomy of nursing and medical students could be increased.

RECOMMENDATIONS

The best learning in adult education takes place through active participation in the educational process. In line with the research findings; to integrate the scenario-based HFS method into the curriculum, to spread this method in health education, and to repeat the study with different scenarios and different populations for nursing and medical students is recommended.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Şerife Karagözoğlu;* ***Design:*** *Şerife Karagözoğlu, Ahmet Altun;* ***Control/Supervision:*** *Yusuf Kenan Tekin, Selma Çetinkaya;* ***Data Collection and/or Processing:*** *Burcu Kübra Süha, Hülya Koçyiğit;* ***Analysis and/or Interpretation:*** *İlknur Yıldız, Fatma Tok Yıldız;* ***Literature Review:*** *Şerife Karagözoğlu, Burcu Kübra Süha;* ***Writing the Article:*** *Şerife Karagözoğlu;* ***Critical Review:*** *Ahmet Altun;* ***References and Fundings:*** *Şerife Karagözoğlu.*

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