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Simülasyon Tabanlı Eğitimin Ebelik Öğrencilerinin Tıbbi Hata Eğilimleri ve Hasta Bakım Davranışlarını Algılamaları Üzerine Etkisi: Randomize Kontrollü Çalışma

The Effects of Simulation-Based Training on Midwifery Student Malpractice Trends and Student Perceptions of Care Behaviors: A Randomized Controlled Trial

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ÖZ

Amaç: Tıbbi hataların önlenmesinde, öğrencilerin yetkinliğini arttırabilmek için simülasyon kullanımı yaygınlaşmaktadır. Çalışmada simülasyon tabanlı eğitimin ebelik öğrencilerinin tıbbi hata yapma eğilimleri ve hasta bakım davranışlarını algılamaları üzerine etkisini belirlemek amaçlandı.

Yöntem: Çalışma tek körlü, prospektif ve randomize kontrollü olarak yürütüldü. Çalışmaya deney ve kontrol gruplarında 60 olmak üzere toplam 120 öğrenci dâhil edildi. Veri toplamada bireysel bilgi formu, Tıbbi Hata Eğilim ve Bakım Değerlendirme Ölçekleri kullanıldı. Veriler Mann Whitney-U testi, Bağımsız gruplarda t testi, pearson, spearman korelasyon testleri ve regresyon testi ile değerlendirildi. Testlerde $p<0.05$ değeri istatistiksel olarak anlamlı kabul edildi.

Bulgular: Çalışmaya dahil edilen deney ve kontrol grubu öğrencileri arasında sosyo-demografik değişkenler (gelir düzeyi, aile tipi, anne ve baba eğitimi) benzerdi ($p>0.05$). Öğrencilerin Bakım Değerlendirme ölçeğinden aldıkları puan ortalamaları deney ve kontrol grupları için sırasıyla 309.15±17.58, 255.42±44.00 olarak saptandı. Deney ve kontrol grupları için Tıbbi hataya eğilim puan ortalamaları ise sırasıyla 201.25±31.09, 146.08±37.89 bulundu ($p=0.000$). Tıbbi hata yapmaya eğilim oranının kontrol grubunda deney grubuna göre 2.734 kat arttığı bulunmuştur. Deney grubunun bakım davranışlarını uygulama sıklığının ve algılamalarının oranının ise kontrol grubuna göre 3.577 kat olumlu yönde arttığı saptanmıştır.

Sonuç: Çalışmada simülasyon tabanlı eğitim, ebelik öğrencilerinin tıbbi hataya eğilimlerini azalttığı ve bakım davranışlarına yönelik algılarını arttırdığı görülmüştür. Ebelik mesleki eğitimi sırasında simülasyon tabanlı eğitim uygulamalarının kullanılması yetkin ve kalifiye meslek üyelerinin yetişmesinde önem arzetmektedir.

Anahtar Kelimeler: Simulasyon, Tıbbi hata, Algı, Bakım, Ebelik öğrencileri.

ABSTRACT

Objective: The use of simulation is becoming widespread in order to increase the competence of students, especially in preventing medical errors. The study aimed to determine the effect of simulation-based training on midwifery students' malpractice trends and perceptions of care behaviors.

Method: This study is a single blind, prospective, and randomized controlled trial. A total of 120 students, 60 in the experimental and control groups, were included in the study. The students were given theoretical training and practical training with simulation method. The data were collected using a personal information form, Medical Malpractice Tendency Scale and Caring Assessment Questionnaire. Data were evaluated with Mann Whitney-U test, independent groups t test, pearson, spearman correlation tests and regression test. A p value of <0.05 was considered statistically significant in the tests.

Results: Socio-demographic variables (income level, family type, and parental education) of the control and experimental groups were similar ($p>.05$). Mean scores of the students in the experimental and control groups from the caring assessment questionnaire were 309.15±17.58 and 255.42±44.00, respectively. The mean scores from the medical malpractice tendency scale were 201.25±31.09 and 146.08±37.89, respectively ($p=.000$). The results showed that the control group had medical

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malpractice tendencies 2.734 times more than the experimental group. However, the experimental group showed a 3.577 times higher rate of providing and perceiving care behaviors than the control group.

Conclusion: In the study, it was seen that simulation-based training reduced midwifery students' malpractice trends and increased their perceptions on care behaviors. The use of simulation-based training applications during midwifery profession training is important in raising competent and qualified professionals.

Key words: Simulation, Malpractice, Perception, Care, Midwifery students.

1. INTRODUCTION

Simulation-based training is used more widely for training health care professionals and students today (1). The main objective of simulation-based training is to promote the quality and safety of health care (2). The related literature mention numerous advantages of simulation-based training (1,2). Advantages of simulation-based training for health care professionals include an increase in students' satisfaction, a significant increase in their knowledge, improvement in their critical thinking skills in clinical conditions, decreasing patients' anxiety about patient safety, increasing care quality for patients, practicing the skills acquired during the simulation, and reinforcing care behaviors (3). Simulations allow students to acquire experience by being exposed to different circumstances, new technical skills and difficult patients in a real-like environment. Using simulators for teaching technical skills can reduce medical malpractice and facilitate adaptation to the equipment (4). Thus, students can provide efficient care to patients by increasing their clinical knowledge and skills without doing any harm (3). Bryant (2019) suggests using simulation-based training to prevent medical malpractice and damage to patients in obstetrics (5).

Midwives, regardless of how skilled and dedicated they are, could make errors while taking care of women. Midwifery errors are associated with a variety of problems that can have fatal consequences for the mother and fetus. Especially management factors, which are the most important cause of midwifery errors, require more attention to reduce midwifery errors (6). The use of simulations for training activities aimed at preventing medical mistakes is useful because the use of these simulations in midwifery training allows students to experience clinical scenarios in a realistic learning setting, which leads to increased clinical qualification and skills in the laboratory setting before entering a clinic (7).

Episiotomy is one of the most widely practiced obstetric procedures and is one of the most common reported procedures for medical errors (8). Failure to perform episiotomy on time and with the right technique can cause physiological and psychological problems in women and reduce their quality of life (9). When repair is not done well, it can significantly affect a woman's ability to experience fecal incontinence, pain, and sexual dysfunction (10). For this reason, it is very important to provide students with the ability to perform and repair episiotomy and to use simulation training method in this (9). Various simulation models have been developed to teach perineal laceration repair, from plastic bench simulators to animal tissue models. One of the animal tissue models used to teach episiotomy repair is the beef tongue. Beef tongue is both expensive and time consuming. However, the sponge is easy and low-cost to prepare but does not create a perception of reality. The essential skills required for episiotomy repair can be gained through training in an animal tissue model simulation (10). In episiotomy repair, the animal tissue model is more suitable for use in training, as it is more similar to human tissue (9).

The increase in student number in midwifery training and the lack of clinical practice areas and number of trainers increases the importance of integrating simulation into training. Simulation-based training can provide knowledge, skills, and attitudes that increase patient safety and facilitate learning. The study aimed to determine the effect of simulation-based training on midwifery students' malpractice trends and perceptions of care behaviors.

Based on the literature, the study sought answers to two research questions:

1. Does the simulation-based training used to gain birth skills have an effect on the medical malpractice tendencies of midwifery students?

2. Does the simulation training used to gain birth skills have an effect on the perceptions of care behaviors of midwifery students?

3. Is there a positive relationship between simulation-based training used to provide delivery skills and students' malpractice trends and perceptions of care behaviors?

2. METHOD

Trial design

The study was conducted as a prospective, single-blind randomized controlled trial. To conduct the study, permission for using the scale, ethics committee approval and written permission from the institution obtained. The study reported according to the Consolidated Standards of Reporting Trials (CONSORT) checklist. The study had registration number from ClinicalTrials.gov (Registration number: NCT04656574).

Sample size and randomization

The study was carried out in the midwifery department of a university in the fall semesters of 2016 and 2017. While performing power analysis in the research, two-way hypothesis was used without specifying direction. The power analysis of the study was calculated as a total of 116 students, 58 in each group, with 0.25 standard deviation and 0.05 degrees of freedom. The universe of the study consisted of 79 students who took the course about vaginal birth (included in the midwifery curriculum) given with simulation-based training and 90 students who took this course for the first time. Considering the possibility of participants losing or dropping out of the study, 142 participants (experimental (M) (n=71) and control (F) (n=71)) were included in the study and were assigned to groups using the block randomization method. A total of 20 blocks were created and the number of participants per block was calculated as 12 students, 6 students for group E and 6 students for group C. Using Microsoft Office Excel 2016, 12 numbers ranging from 1 to 20 were randomly generated (8, 1, 13, 9, 15, 17, 19, 6, 14, 2, 18, 7). A total of 142 students were evenly assigned to both groups. The investigators randomly allocated the participants either to the experimental group (71 randomly selected students who took the course explaining vaginal delivery for the first time), or to control group (71 randomly selected students who agreed to participate in the study). Single blinding was provided as the participants did not know which group they were assigned to.

There were no significant changes in methods after the trial started. During the trial, 11 students in the control group and 11 students in the experimental group lost follow-up (Control

group: 2 students who did not fill out the questionnaire, 6 students who did not do model work, Discontinued intervention 3 students; Experimental group: 3 students who did not fill out the questionnaire, 3 students who did not do model work, discontinued intervention 5 students).

Participants

The students who received simulation based training in the study setting, were older than 18 years, volunteered to participate in this study, knew how to read, write and speak in Turkish, stayed within this study until the end and fully completed the data collection forms were included. Students who didn't meet the inclusion criteria were excluded from the study.

Data collection tools

Data collection tools included a personal information form, medical malpractice tendency scale in nursing, and caring assessment questionnaire.

The personal information form included sociodemographic attributes of the students.

The medical malpractice tendency scale in nursing includes routine patient care activities of the nurses. It was developed by Ozata & Altunkan (2010) (11). The Likert-type scale, scored between 1 and 5, includes 49 items and consists of five subscales. The scoring is 1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always. The minimum score is 49 and maximum is 245 points. A higher total score indicates that nurses have less medical malpractice tendencies. The scale includes five subscales: drug and transfusion administration, prevention of infections, patient monitoring and material-device safety, prevention of falls, and communication. In our study, the cronbach alpha reliability coefficient of the scale was calculated as 0.98.

We could not found the medical malpractice scales in midwifery in literature. However, in the literature review, we determined the studies where the medical malpractice tendency scale in nursing was used on midwives (12-14). Accordingly, we decided to use this scale in our study to determine the tendency to medical malpractice.

The caring assessment questionnaire/Care-Q was developed by Lee et al. (2006) and adapted to Turkish by Eskimez, & Acaroğlu (2019) (15,16). This Likert-type scale, scored between 1 and 7, includes 50 items and consists of six subscales. The scoring is 1=Never, 2=Rarely, 3=Occasionally, 4=Sometimes, 5=Frequently, 6=Usually, 7=Every time. The minimum score is 50 and maximum is 350 points. A higher score indicates a positive increase in the frequency of providing and perceiving care behaviors. The six subscales are attainability, descriptions and facilities, comfort, expectations, reassuring communication, and observation and follow-up. In our study, the cronbach alpha reliability coefficient of the scale was calculated as 0.95.

Interventions

Out of 79 students, 71 were randomly assigned to the experimental group receiving education using simulation-based training and out of 90 students, 71 were randomly assigned to the control group that received the course explaining vaginal delivery for the first time. Among the 142 students who agreed to participate in the trial, 120 students (84.5%) completed study (E, n= 60 and C, n= 60). Twenty-two students withdrew from the study because they did

not fill out the questionnaires (E= 3; C= 2), did not do model preparation studies (E=3; C=6), and did not attend the course regularly ((E=5; C=3) (Figure 1).

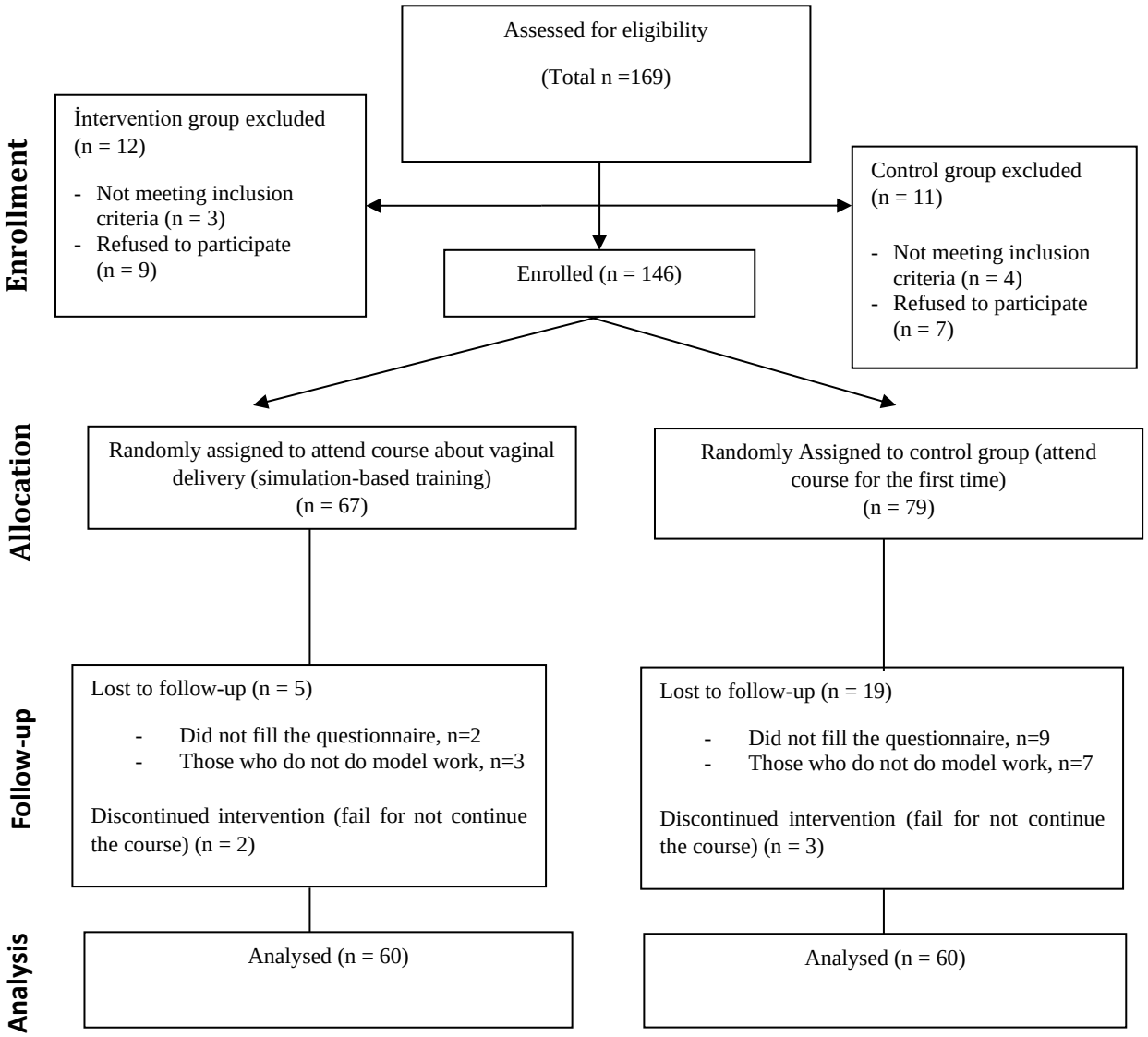

Figure 1: Follow diagram of students

Content of simulation training

The simulation training included the activities that midwives should do during the childbirth and management of vaginal delivery. In addition, they were taught how to perform episiotomy repair when faced with labor that underwent episiotomy intervention. The students received theoretical training, and to reinforce it, they were asked to mold a fetal head from a potato, make a cardboard cervix showing dilatation measurements during vaginal delivery, and make a fetal position identification model taking the occiput as a reference point (Figure 2). Bone pelvis, fetal head, fetus, cervical dilatation and effacement, fetal descensus, and maternal-neonatal birthing simulators (2 of each model) were used by the researchers to monitor, manage, and provide care for the progress of labor.

The students in the experimental group simulated vaginal delivery by monitoring and managing childbirth and providing care to the models. During the skills lab, we situated six

trainees at one table with six chicken breasts models and six episiotomy set. Each chicken breast model was set in a suturing board. We placed episiotomy set beside the each suturing board. We provided a variety of sutures, such as permanent and absorbable of varying catgut, for the students to consider using. Students were asked first to perform episiotomy and then to describe their surgical approach to the repair (Figure 2). After making any necessary corrections to their plan, the researcher observed the laceration repair. We assigned 30–40 minutes to finish the repair and found that some students spent this time on a single repair, whereas others performed the repair two or three times. Following the repair, the researcher debriefed with the students by reviewing correct and incorrect steps in the repair. Thus, skill training has been completed. Simulation cases included the vaginal delivery steps and the progression during these steps.

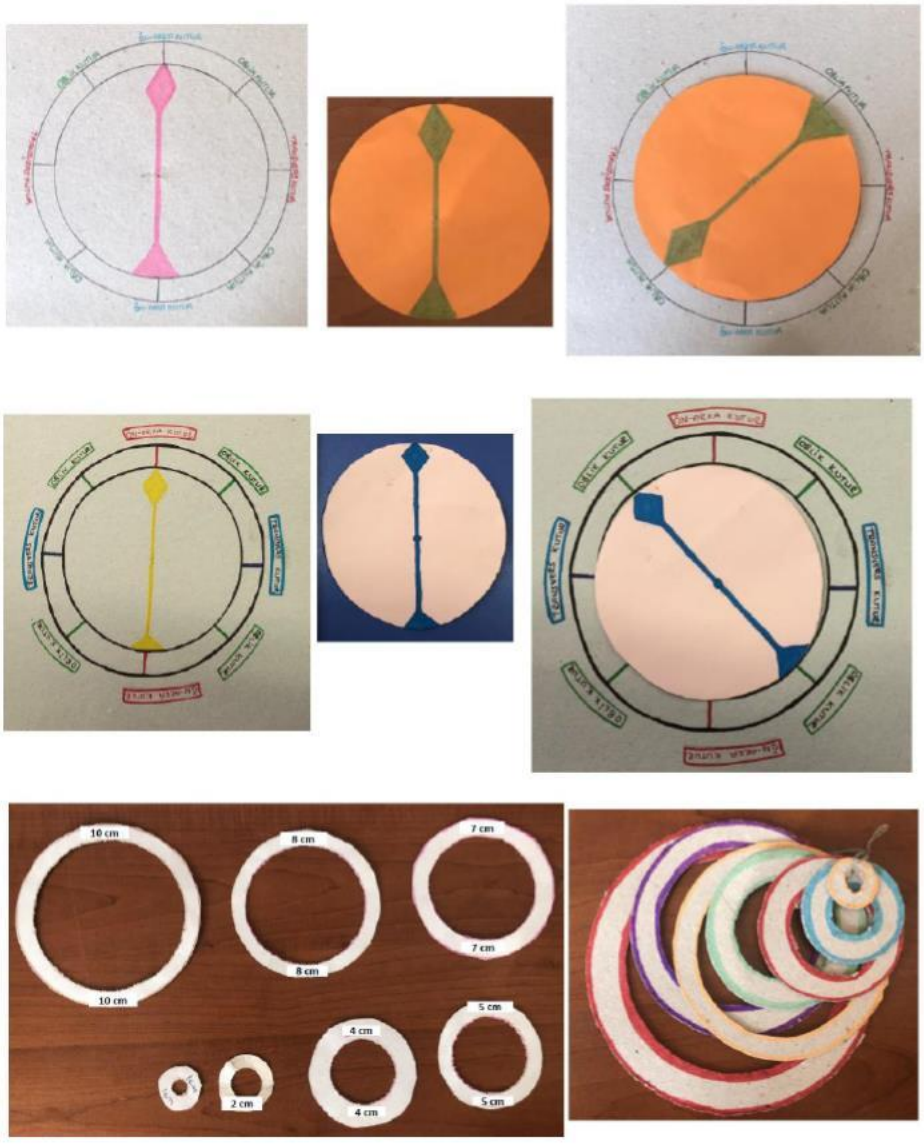

Figure 2: Fetal position identification models and cardboard cervical dilatation model

In order to prevent the tendency to medical malpractices, the most common faulty attempts were mentioned during the theoretical training. In addition, verbal warnings were given to the students about the attempts with a high risk of medical malpractices during the care and follow-up skills training (Such as not injecting methergine (methylergonovine maleate)

without measuring the blood pressure of the woman in the third phase of the labor). Thus, skill training has been completed. Simulation cases included the vaginal delivery steps and the progression during these steps.

The students in the control group received theoretical training about management and care of vaginal delivery. In addition, the researchers demonstrated them how to monitor and manage the delivery process and provide care. The students in both groups completed a personal information form, medical malpractice tendency scale in nursing, and caring assessment questionnaire. Before use, five academic experts were consulted for management and content of the simulation-based training, objectives, questions, and cases and corrections were made accordingly.

Case scenario content of simulation

The introduction included introductory information about the pregnant women (name and surname, age, height, and pre-pregnancy and current weights) and information about their clinical status (gynecological examination findings, resume and family history characteristics, past and present pregnancy history, last menstrual period, laboratory tests, and ultrasonography results, as well as the physical examination findings).

Instructional objectives included monitoring and managing the vaginal delivery and providing care. In line with these objectives, the students were expected to recognize the features of childbirth phases, determine deviations from normality, identify interventions that should not be made routinely during the childbirth process, use a partograph, use non-pharmacological analgesic methods to help pregnant women cope with contractions, use non-pharmacological analgesic methods to reduce perineal trauma (perineal massage, massage with oils/wax, warm compresses and "hands on" techniques), efficiently manage the third stage of delivery, help post-natal interaction between neonate and mother, and perform all midwifery interventions according to aseptic techniques (17). A 10-minute preliminary information session was provided to the students regarding simulation cases and expectations from them. The simulation period was 15 minutes and the evaluation period was 20 minutes for each delivery phase.

Data Analysis

Statistical analyses were made using Statistical Package for Social Sciences (IBM SPSS) Statistics 22 software. The findings were analyzed using descriptive statistics (average, standard deviation, frequency, and percentage). The Kolmogorov-Smirnov test was used to determine normal distribution of the data. The independent samples t-test was used for intergroup comparison of normally distributed continuous variables. Malpractice Trend Scale in nursing and Caring Assessment Questionnaire were evaluated as dependent variables, and study groups as independent variables. The Mann-Whitney U test was used with independent samples for intergroup comparison of non-normally distributed continuous variables. Regression analyses were performed. The significance value was accepted as $p<0.05$ for statistical tests

Ethical considerations

Ethics Committee approval (Decision No: GO 2016/31) was obtained to conduct the study. The research was carried out in accordance with the declaration of Helsinki. Before the training started, the students were given information explaining the purpose and procedure of the study. Informed consent obtained from the students. In order to avoid ethical problems, students who used and did not use simulation teaching method were not given any scoring that could affect their success in the course. In addition, there was no evaluation of the students as successful or unsuccessful within the scope of this training. Based on the principles of education and equal opportunity in the research, the simulation training content was applied to the eager students in the control group after the research was completed.

3. RESULTS

Among the 142 students who agreed to participate in the trial, 120 students (84.5%) completed study (E, n= 60 and C, n= 60). No significant difference was found between the experimental and control groups in terms of sociodemographic variables (income level, family type, and parental education) ($p>0.05$) (Table 1).

The students in the experimental group had a mean score of 201.25±31.09, whereas the control group had 146.08±37.89 on the medical malpractice tendency scale in nursing. The students in the experimental group had a mean score of 309.15±17.58, whereas the control group had 255.42±44.00 on the caring assessment questionnaire. A significant difference was found between the groups' mean total scores on the medical malpractice tendency scale in nursing and caring assessment questionnaire ($p=.0000$). The experimental group had higher mean scores on the medical malpractice tendency scale in nursing and caring assessment questionnaire subscales (except for expectations and reassuring communication) than the control group (Table 2).

Table 1. Socio-demographic characteristics of the students in the experimental and control groups (N=120)

Variable	Experimental (n=60)		Control (n=60)		X^2	p
	n	%	n	%		
Education level of mother						
Primary school	10	16.7	18	30.0		
High school	26	43.3	23	38.3	3.051	0.218
University and higher	24	40.0	19	31.7		
Education level of father						
Primary school	7	11.6	16	26.7		
High school	13	21.7	14	23.3	4.987	0.083
University and higher	40	66.7	30	50.0		
Family type						
Nuclear family	44	73.3	40	66.7		
Extended family	9	15.0	17	28.3	4.252	0.119
Broken family	7	11.7	3	5.0		
Income level						
More expenses than income	26	43.4	18	30.0		
Equal income and expenses	23	38.3	25	41.7	2.824	0.244
More income than expenses	11	18.3	17	28.3		
	Mean±SD		**Mean±SD**		**Z**	**p**
Age	21.92±1.11		21.13±0.89		-4.078	0.000

X^2=Chi-Square Test, Z=Mann-Whitney U Test

Table 2. Comparing the Mean scores of the experimental and control groups from malpractice trend scale in nursing and caring assessment questionnaire (N=120)

Variable	Experimental	Control	Statistical Significance	
	Mean±SD	Mean±SD	Z/t	p
Malpractice trend scale in nursing				
Drug and transfusion administration	76.55±17.17	52.40±16.77	-6.196	**0.000**
Prevention of infections	49.18±10.67	31.82±12.27	-6.605	**0.000**
Patient monitoring and material-device safety	35.88±7.26	27.93±5.04	6.968[a]	**0.012**
Prevention of falls	19.33±5.72	17.27±4.61	-2.773	**0.006**
Communication	20.40±4.92	16.67±5.67	-3.390	**0.001**
Scale total score	201.25±31.09	146.08±37.89	-6.728	**0.000**
Caring Assessment Questionnaire/Care-Q				
Attainability	37.15±4.22	28.50±7.10	-6.625	**0.000**
Descriptions and facilities	37.17±4.25	26.90±9.01	-6.625	**0.000**
Comfort	56.75±6.03	40.18±14.69	-6.638	**0.000**
Expectations	30.62±3.21	29.45±3.54	-1.773	0.076
Reassuring communication	96.53±6.59	94.30±7.80	-1.886	0.059
Observation and follow-up	50.93±5.62	36.08±15.38	-5.993	**0.000**
Scale total score	309.15±17.58	255.42±44.00	8.783[a]	**0.000**

Z=Mann-Whitney, t=T-test in independent groups, a=T-test in independent groups

The results showed that the control group had medical malpractice tendencies 2.734 times more (95% CI: 2.446-3.023) than the experimental group. However, the experimental group showed a 3.577 times higher rate of providing and perceiving care behaviors (95% CI: 3.103-4.050) than the control group (Table 3).

Table 3. Regression analysis of mean scores of the experimental and control groups from the malpractice trend scale in nursing and caring assessment questionnaire (N=120)

Total-Subscales	Exp (B)	95% confidence interval		R^2	p
		Lower	Upper		
Malpractice trend scale in nursing					
Drug and transfusion administration	2.407	2.165	2.649	0.340	0.000
Prevention of infections	2.356	2.139	2.574	0.367	0.000
Patient monitoring and material-device safety	2.670	2.329	3.011	0.292	0.000
Prevention of falls	1.842	1.519	2.166	0.039	0.031
Communication	2.054	1.756	2.352	0.104	0.000
Scale total score	2.734	2.446	3.023	0.393	0.000
Caring assessment questionnaire/Care-Q					
Attainability	2.858	2.519	3.198	0.358	0.000
Descriptions and facilities	2.594	2.313	2.875	0.351	0.000
Comfort	2.543	2.277	2.808	0.356	0.000
Expectations	2.257	1.459	3.055	0.021	0.061
Reassuring communication	2.515	1.326	3.705	0.024	0.093
Observation and follow-up	2.364	2.108	2.619	0.295	0.000
Scale total score	3.577	3.103	4.050	0.395	0.000

R^2=Linear Regression Test

The interventions applied in this trial have no side effects or negative effects on the students in both the experimental and control groups.

4. DISCUSSION

Simulation is accepted as a teaching method allowing effective clinical learning (18,19). It creates an appropriate environment for knowledge and clinical practice without any risk for patients (1,20,21). This study has shown that students who use simulation-based training have less medical malpractice tendencies and develop the frequency of providing and perceiving care behaviors in a positive way. Regression analysis showed that medical malpractice tendencies of the control group increased by 2.734 times (95% CI: 2.446-3.023) and the frequency of providing and perceiving care behaviors of the simulation group increased by 3.577 times (95% CI: 3.103-4.050). A study using simulation for providing clinical skills and teaching patient safety behaviors reported that studies had a good time during simulation and the practices provided benefits to the studies (22). Another study showed that simulation helped the students to develop skills in managing and care behaviors in vaginal delivery (20). A similar study, discussing simulation and skills training, stated that the students felt ready and confident before the internship (23). A study investigating students' skills in ethical cases found that the students in the simulation group had significant changes in their decision-making skills (24). Simulation provides an intensive and effective study environment and increases the efficiency of patient activities, critical thinking, and the time spent in independent activities (25). Simulation allows caregivers to prepare for emergencies and increases their confidence and comfort (26). Based on the related studies, simulation is a useful teaching method that can increase patient safety and care quality.

The study showed that simulation reduced medical malpractice tendencies in the subscales of the medical malpractice tendency scale in nursing. Regression analysis showed that the medical malpractice tendency of the control group increased by 2.407 times (95% CI: 2.165-2.649) in the transfusion administration, 2.356 times (95% CI: 2.139-2.574) in the prevention of infection, 2.670 times (95% CI: 2.329-3.011) in the patient monitoring and material-device safety, 1.842 times (95% CI: 1.519-2.166) in the prevention of falls, and 2.054 times (95% CI: 1.756-2.352) in the communication subscales of the medical malpractice tendency scale in nursing. Young et al. (2019) stated that using simulations to teach technical skills reduces medical malpractice and allows the trainees to be more familiar with the equipment and adapt themselves more easily before using on real patients. In addition, the study showed that the trainees can practice their communication and behavior skills in a simulated environment and thus, learn how to effectively manage a case with other team members (4). Simulations in the educational environment increase knowledge, self-confidence, and practice skills of students and ensure patient safety and safe health care (27).

The study found that the frequency of providing and perceiving care behaviors was increased in the subscales of the caring assessment questionnaire. Regression analysis showed that the frequency of providing and perceiving care behaviors of the experimental group increased by 2.858 times (95% CI: 2.519-3.198) in the attainability, 2.594 times (95% CI: 2.313-2.875) in the descriptions and facilities, 2.543 times (95% CI: 2.277-2.808) in the comfort, and 2.364 times (95% CI: 2.108-2.619) in the observations and follow-up subscales of the caring assessment questionnaire. Dearnley & Meddings (2007) stated that students' clinical skills depend on self-assessment skills and students who have developed self-assessment skills develop better clinical skills than those who do not (28). Another study

discussed that simulation is an effective method for increasing knowledge and developing skills and attitudes regarding palliative care (29). A study conducted with intensive care nurses found that holistic nursing care showed a great progression after incorporating simulations (30). Simulation makes connections between theory and practice, thereby facilitating learning skills of students. Using simulations, students feel prepared and competent for clinical practices and have more developed skills.

The expectations and reassuring communication subscales of the caring assessment questionnaire were not affected by the simulation. In a similar vein, Lee et al. (2019) stated that simulation is not realistic enough regarding communication and psychological aspects of care in particular (1). Simulation is certainly an effective method for midwifery education. However, expected improvement in students' perceptions of patient expectations and care behaviors and communication may not be assured because students know that they are working on a model no matter how real-like the simulation is.

5. CONCLUSION

The results showed that the use of simulation-based training in midwifery education promoted students' perceptions on care behaviors and decreased their malpractice trends. However, it did not affect students' perceptions on the care behaviors in terms of expectations and reassuring communication. No matter how well simulation-based training imitates clinical environments, it is impossible to create a real clinical context and establish a professional reassuring communication. This is because students know that it is a simulation and not a real patient. Simulation-based training contributes to reducing student malpractice and increasing their perceptions of patient care, patient safety, and care quality. Furthermore, it improves their critical thinking in clinical cases and technical skills. Therefore, spread of simulations in the departments of health education can promote both the quality of education and the number of qualified health care professionals. The future of midwifery training should be rearranged to include simulation-based training. Simulation-based training has been integrated into undergraduate education in Kutahya University of Health Sciences, department of midwifery. Instructors in the department of midwifery are suggested to use simulation-based training for their students.

Limitations

The study was conducted in one university and the data were obtained from the students in the midwifery department only. The study used simulation-based training and focused on developing students' skills on vaginal delivery only. To develop other clinical and non-clinical skills, conducting research using simulation-based training will be beneficial.

Ethical Consideration of the Study

Ethics Committee approval (Decision No: GO 2016/31) was obtained to conduct the study. The research was carried out in accordance with the declaration of Helsinki.

Conflict of interest statement

The authors do not have any interest-based relationships.

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