

Original Article

Effect of Computer-Based Simulator Use on Students' Self-Confidence, Satisfaction and Perceived Learning

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Abstract

Objective: This study aims to determine third-grade (junior) nursing students' self-confidence, satisfaction, perceived learning levels in a simulation of pediatric drug administration.

Methodology: This cross-sectional, quasi-experimental study sample included 30 nursing students studying in the third year of a nursing school. The students participated in a drug administration simulation after filling out the socio-demographic information form. The simulation was evaluated using The Student Satisfaction, Self-Confidence in Learning Scale, students' learning levels were evaluated using the Perceived Learning Level Scale.

Results: Of the participants, 86.7% were female, their mean age was 22.5 ± 3.25 . The Satisfaction and Self-Confidence in Learning Scale indicated that the mean satisfaction score was 4.260 ± 0.735 , and the mean self-confidence in learning score was 4.095 ± 0.591 . The students, who were satisfied with the application in the relationship between satisfaction and self-confidence, also had higher self-confidence ($p:0.000$).

Conclusion: Using simulation increases the nursing students' satisfaction, self-confidence, and learning levels.

Keywords: Simulation, pediatric nursing, self-confidence, perceived learning

Introduction

The complex health environment in hospitals causes various problems for students who only recently developed their knowledge and skills. In particular, undergraduate level nursing students need support to develop their clinical decision-making skills in healthcare environments. However; the students' interaction with real patients remains limited in clinical environments because of an inadequate number of clinics to meet the requirements of the nursing schools, an excessive number of students, and patient safety

(Unver and Basak, 2016; Sari and Erdem, 2017; Sinclair and Ferguson, 2009).

The World Health Organization (WHO) published the golden standards for the education of nurses. These standards indicate that using electronic learning and simulation methods in the programs of nursing students is vital for teaching and learning (WHO, 2011). Simulation, which is an interactive learning method, can create realistic responses as far as possible with different levels of simulators. Therefore, it contributes to nursing education in critical subjects such as developing students' clinical decision-making, organizing their

priorities, communication, and time management (Park, 2018; Uslusoy, 2018). Using simulators provides participants/students with a safe laboratory environment in which they administer and provide care without exposing patients to any negative results. Simulation is significant because students do not hurt patients during administration and the simulation provides benefits while improving students' sufficiency and competence (Sahiner, Turkmen, and Kuguoglu, 2017; Zapko, 2018). Simulation-based education is provided in a safe and realistic environment. It ensures interactive learning and teaching environment for students apart from a safe environment for acquiring knowledge, discovering hypotheses, turning theoretical knowledge into skills, and acquiring psychomotor skills (Foronda et al, 2013; Terzioglu et al., 2012). Nursing students indicated that they mostly suffer from anxiety when turning their theoretical knowledge into practice. This anxiety negatively affects their clinical decision-making and self-confidence. The greatest benefits of simulations include reducing students' anxiety levels and increasing their self-confidence levels (Sinclair & Ferguson, 2009; Bektas & Yardimci, 2018).

One of the significant fields in simulation education is Simulation Assessment Themes (Figure 1).

One of the themes to evaluate is Confidence/Self-Efficacy. Participants' satisfaction can be evaluated using a Satisfaction Theme. Simulation activities experienced by students are evaluated using qualitative and quantitative measurements (Jeffries&Rizzolo, 2006). This study was conducted to determine the confidence, satisfaction, and perceived learning levels of third-year nursing students in pediatrics using a nursing simulation model.

Methodology

Study Design: The cross-sectional, quasi-experimental study was conducted to determine the self-confidence, satisfaction, and perceived learning levels of students who participated in the pediatric nursing practice.

Study Sample: The study population included third-year pediatric nursing school students who participated in the Pediatrics nursing practice (February-May 2018). After consulting the

Biostatistics and Medical Informatics Department, simple random randomization method was used in the selection of the sample and 30 students who accepted to participate in the study constituted the sample. A person other than the researcher and students prepared the randomization list using the R version 3.1.3 package program, and the list was given to the researcher during the application. The study included students who agreed to participate in the study and completed the forms. It excluded those who refused to participate in the study and did not complete the forms (Figure 2).

Data Collection Tools: Data were collected using the following tools:

Student Information Form: Researchers used an information form including four questions to determine the students' sociodemographic characteristics. The form included questions regarding the students' age, gender, high school from which they graduated, the status of studying in the department willingly, and academic standing.

Student Satisfaction and Self-Confidence in Learning Scale: This scale was developed to test and analyze the results in nursing simulations on a theoretical basis by Jeffries and Rizzolo (2006). The scale was developed with 13 items, which decreased to 12 during its Turkish adaptation. These 5-point Likert-type scale questions included the subscales Satisfaction Regarding Current Learning (5 items) and Self-Confidence in Learning (7 items). They did not include any negative items. The Cronbach's Alpha (α) value of the scale was 0.85, 0.77, and 0.89, for the Satisfaction Regarding Current Learning, Self-Confidence in Learning, and the total scale, respectively. Total subscale scores do not equal the total scale score. The total scale score is obtained by the division of total subscale scores by item number. As the total scale score increases, student satisfaction and self-confidence in learning also increase (Unver et al., 2017).

Perceived Learning Level Scale: Rovai et al. developed this scale in 2009 to measure cognitive, affective, and psychomotor learning. Albayrak et al. performed its Turkish reliability and validity study. Using a 7-point Likert-type scale, the 1st, 2nd, and 5th items assessed cognitive, 4th, 6th, and 9th items assessed affective, and the remaining items assessed psychomotor dimensions of the

scale. Its Cronbach's Alpha value was 0.83 (Albayrak et al., 2014).

Data Collection Procedure: This study was conducted after obtaining necessary permissions from the Scientific Research and Publication Ethics Committee of the university between February 2018 and September 2018. The participants were asked to complete an information form regarding their sociodemographic characteristics after they were given the necessary information about the study. The students participated in high-fidelity simulations (S300.105 Code Blue III 5-Year Advanced Life Support Training Simulator) including drug dose calculation and administration for the "Pediatric Drug Administration" scenario in parallel with the pediatric drug administration course they took during the fall term. The scenario included following-up of a 5-year-old patient who presented with fever, vomiting, restlessness, and itching to the emergency department and dispensing, administering and recording the drugs in the

ordered treatment. Each student performed the exercise once with a time limit of 15 minutes. Student simulations were sequential to prevent students from affecting each other. After the simulation ended, students were given feedback according to the notes from the observer. Lastly, the simulation was evaluated using The Student Satisfaction and Self-Confidence in Learning Scale, and students' learning levels were evaluated using the Perceived Learning Level Scale.

Data Analysis: Data analysis was conducted using the SPSS 22.0 package program. Distributions were compared using descriptive statistical tests and chi-square analysis.

Ethical Considerations: Necessary permissions were obtained from the Scientific Research and Publication Ethics Committee of the university (Protocol Number: 256-2017, Date: 27.07.2017). The researcher informed the students regarding the aim of the study, and the students' verbal permissions were obtained.

Table 1: Participants' Sociodemographic Characteristics (n=30)

	n	%	Mean ± SD
Mean age			22.5 ± 3.25
Gender			
Female	26	86.7	
Male	4	13.3	
Status of Studying in the Department Willingly			
Yes, I chose to study.	11	36.7	
No, I am not studying by choice.	4	13.3	
I am studying in this department because of the job guarantee.	5	16.7	
At first, I did not want to, but now I love studying here.	2	6.7	
My family insisted I study here.	3	10	
My score was only enough for this department.	3	10	
Other	2	6.7	
Your Academic Standing According to You			
Low	2	6.7	
Medium	18	60	
Good	8	26.7	
Very Good	2	6.7	

Table 2: Status of Being Satisfied with the Simulation According to the Satisfaction and Self-Confidence Scale in Learning

	X ± SD	Minimum Value	Maximum Value
Mean Satisfaction	4.260 ± 0.735	2	5
Mean Self-Confidence	4.095 ± 0.591	2.29	5

Table 3: Simulation Effect on the Perceived Learning Scale

	X ± SD	Minimum Value	Maximum Value
Mean Perceived Learning	4.77 ± 0.552	3.56	5.78

Table 4: Relationship between Simulation Satisfaction and Simulation Effect on Self-Confidence

	X ± SD	X ²
Mean Satisfaction	4.26 ± 0.73	
Mean Self-Confidence	4.09 ± 0.59	0.000



Figure 1: Simulation Assessment Themes (Foronda et al., 2013).

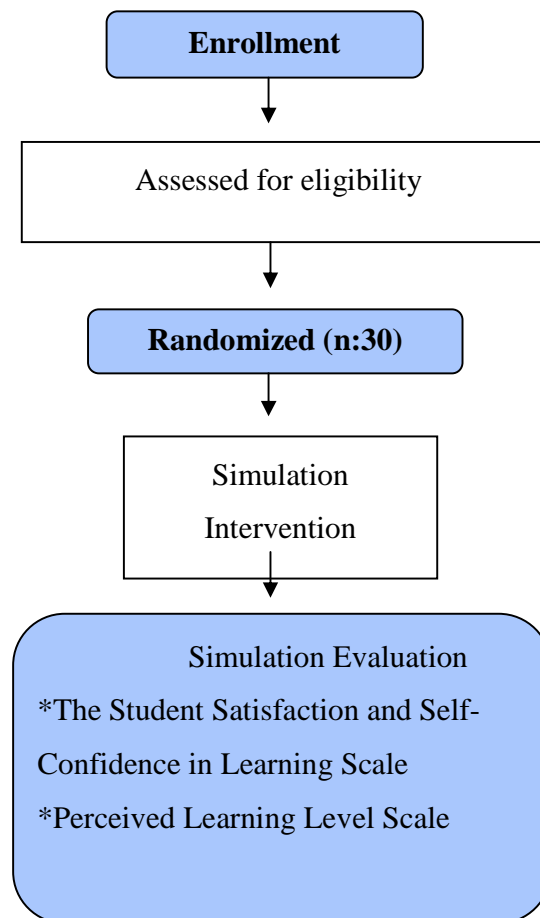


Figure 2: Data Collection Stages

Results

Participants' Characteristics: Of the participants, 86.7% were female, their mean age was 22.5 ± 3.25 , 96.7% were single, and 63.3% graduated from an Anatolian high school. In addition, 30% indicated they mostly lived in the county, 36.7% said they studied in the department willingly, and 60% stated their academic standing was medium (Table 1).

Satisfaction/Self-Confidence in Learning and Perceived Learning: The students' mean satisfaction score was 4.260 ± 0.735 (Min: 2 and Max: 5) according to the Satisfaction and Self-

Confidence in Learning Scale. Because the mean scale score was close to the maximum score (scored between 1 and 5), the students were satisfied (Table 2). Students' mean self-confidence in learning score was 4.095 ± 0.591 (Min: 2.29 and Max: 5) according to Satisfaction and Self-Confidence Scale in Learning. Because the mean scale score was close to the maximum score of 5, the simulation contributed to improving students' self-confidence (Table 2).

The effect of the simulation on students' mean perceived learning score was 4.77 ± 0.50 (Min: 3.56 and Max: 5.78) according to the Perceived Learning Scale (Min: 1 and Max: 7) (Table 3).

There was a significant relationship between being satisfied with the simulation application and the effect of the application on self-confidence. The students who were satisfied with the application also had higher self-confidence (Table 4).

Discussion

Today, various instructional technologies are used in education environments and many include computer-aided simulation applications (Edeer & Sarikaya, 2015). Simulations in nursing education aim to increase the students' academic standings and improve their critical thinking, decision-making, and communication skills. Simulation-based education is significant because it develops a sense of confidence, abolishes the anxiety related to hurting a real patient, and provides a learning environment (Unver & Basak, 2016). The nursing education literature assessing simulations includes various studies regarding the subject. However, only a limited number of studies question the effect on students' self-confidence, satisfaction, and perceived learning levels. This study investigated the effect of simulation training on students' self-confidence, satisfaction, and perceived learning levels from the simulation training.

This study found the students' satisfaction status high according to satisfaction and self-confidence in learning (Mean Satisfaction: 4.260 ± 0.735 ; Mean Self-Confidence: 4.095 ± 0.591). In parallel with the study results, satisfaction and self-confidence scores of the students who used the high-fidelity simulator in the study of Başak et al. were 4.67 ± 0.44 and 4.51 ± 0.38 , respectively (Basak et al., 2016). In their study determining the students' opinions regarding standard patient and simulator use, Sarmasoglu et al. indicated that students in the control group who used a simulator feel safer and more comfortable than those in the experimental group (Sarmasoglu et al., 2016). In their study determining students' opinions regarding the simulation method, Terzioglu et al. found that the simulation increases students' self-confidence and satisfaction levels (Terzioglu et al., 2012). Weaver investigated the effect of simulation on students' satisfaction and found that simulation significantly increases the students' satisfaction levels (Weaver, 2015). In their study evaluating the effect of simulator use on learning using a student satisfaction and self-confidence scale, Zapko et al.

found the self-confidence and satisfaction levels are high in the student group using the simulator (Zapko et al., 2018).

This study found that simulation use had positive effects on the perceived learning levels of the students (4.77 ± 0.552). Similarly, a study by Tiwari et al. indicated that simulations have positive effects on perceived learning (Tiwari et al., 2014). In their study investigating the relationship between students' learning attitudes, level of knowledge before simulator-based training, education type, and perceived learning, Winberg and Hedman stated that simulator-based training has positive effects on the participant's learning levels (Winber & Hedman, 2008).

Conclusion: Simulation use has increased in pediatric nursing education due to the importance of patient safety and the standardization of education. Clinical conditions can be created in a realistic and safe environment with simulation training, which significantly enhances students' skills. In this study, students indicated increases in their critical thinking and clinical decision-making, and problem solving skills increased their satisfaction, self-confidence, and perceived learning levels.

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