RESEARCH ON EDUCATION AND PSYCHOLOGY (REP)

Received: September 21, 2017
Revision received: November 17, 2017
Accepted: November 29, 2017
OnlineFirst: December 7, 2017

e-ISSN: 2602-3733
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http://journalrep.com
December 2017 ◆ 1(1) ◆ 38-46

Research Article

The Use of Simulation in Nursing Education: The Example of Myocardial Infarction

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Abstract

This study was conducted to analyze the effect of simulation on student success in teaching of nursing care in myocardial infarction which is given within the scope of the internal medicine nursing course. In the case of myocardial infarction, the 100-point academic achievement test was applied before the simulation application based on the nursing care scenario. The same achievement test was applied again after the simulation application. Frequency, percentage, chi-square, t-test (Paired Samples t test) were used in the evaluation of the data. The level of significance was accepted as 0.05. The mean of the academic success test scores of the students was found to be 44.22 before the simulation while it was found to be 63.77 after the simulation on the scale of 100. This difference was statistically significant (p<0.05). The creation of the environments which are close to real environment and the learning it by the students by experience are thought to increase the permanence of the education.

Key Words

Simulation • Nursing Education • Student Success

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Citation: Çayır, A., & Özkal, F. (2017). The use of simulation in nursing education: The example of myocardial infarction. *Research on Education and Psychology (REP), 1*(1), 38-46.

Simulation is defined as imitation of actual tasks, relationships, equipments, behaviors or some cognitive activities. Video, DVD display, computer aided simulation, computer controlled simulators, interactive patient simulators, and simulated/ standardized role playing with patients are within the scope of the simulation applications used in nursing education (Karadağ, Çalışkan, & İşeri, 2015; McCaughey & Traynor, 2010).

Nursing education is a combination of theoretical and practical components including cognitive, emotional and psychomotor domains of learning, it needs to integrate theory and practice. For this reason, the education process should make a contribution to the internalisation of the knowledge, skills, attitudes and ethical standards of their own disciplines by the students and making them as a part of their behavior (Boztepe & Terzioğlu, 2013; McCaughey & Traynor, 2010; WHO, 2016).

The professional nursing education is based on cultural and professioal knowledge, clinical and conceptual skills and the individual's system of values. In this educational process, students learn the necessary theoretical knowledge for the school and try to transform these knowledge to the clinical judgement in the field of practice and behavior (Hakverdioğlu-Yönt, Zehirlioğlu, Akın-Korhan, & Çevik, 2015; WHO, 2016).

The simulation, which is thought to be useful in the development of these skills, is used in nursing education as an educational strategy. The simulation has a role as a bridge between clinical practice and theoretical academic program, is defined as "a method which represents a clinical situation as much as real to make easier to understand and manage this condition when this condition is actually encountered" (Sunal, 2013). Students need to increase their clinical competence in a virtual or laboratory environment before the actual patient care environment. The previous studies indicated that that pre-clinical instructions and laboratory environments are not sufficient, and students can not apply their learned theoretical knowledge sufficiently in the clinical environment; in other words, they find themselves insufficient (Terzioğlu et al., 2012).

Therefore, it is necessary to establish the laboratory environments in which the students actively participate in the education process, and the simulation education is given. The technical equipments and devices should provided in these laboratory environments, thus the students can experience patient care. These professional skills laboratories help to close the gap between clinic and theory via providing the environments which are similar to clinical practice, help the preparation of the students to the clinical environment and help them to use their knowledge, skills and attitudes in practice (Gürol, Akpınar-Balcı, & Ejder-Apay, 2016). It is known that the simulation applications used in medical skills education improve the relations between the theory and the clinic, the development of psychomotor skills, decision making, critical thinking and therapeutic communication methods (Cantrell, 2008; Chronister & Brown 2011). Simulation education facilitates medical skills education without exposing patients to certain risks, allows students to gain experience without anxiety and provides a safe environment for education (Rhodes & Curran, 2005).

The World Health Organization (WHO, 2016) has published the gold standards in nursing education. WHO recommends the use of electronic learning and simulation methods in the programs of nursing schools for learning and teaching according to these standards (WHO, 2009). The American Association of Colleges of Nursing (AACN, 2005) and the National Council of State Boards of Nursing (NCSBN) have reported that the use of simulation and online learning methods in nursing education is useful. The National League for Nursing (NLN, 2005) recommends the use of information technology (computer programs, simulations, web, etc.) to

facilitate the learning of the students and to support the learning process in the basic competencies of nurse educators (NLN, 2005; WHO, 2016).

It is thought that simulation has an important role in the development of many cognitive, emotional and psychomotor behaviors in nursing education which is based on reflection of scientific knowledge into practice. In this way, the study was conducted to show how the simulation affect the student's success on the basis of the idea which suggests learning occurs more effectively in this way.

Aim: This study was conducted to analyze the effect of simulation on student success in the education of nursing care in myocardial infarction given in internal medicine nursing course.

Materials and Method

Design of the Study

This study was conducted as a semi-experimental pretest and posttest design study in the direction of purpose.

Study Group

The universe of the study is consisted of sophomores in a nursing departments of state universities. The sample was not selected, because all of the universe will be included in the study. The nursing sophomeres, the students who took internal medicine nursing course and who accepted to participate in the study were included in the study. A total of 48 students who fulfilled these conditions were included in the study.

Data Collection and Data Collection Tools

In addition to the questionnaire which contained the students' introductory characteristics and literature scan, the academic achievement test, which is evaluated over 100 points, was prepared by researcher taking the expert opinion and accordance with the scenario goals with the subject of nursing care in myocard infarction . Multiple-choice and short-answer open-ended questions were prepared to measure academic success. The data were collected by applying the success test before and after the simulation.

Analysis of Data

The data were analyzed and interpreted using SPSS 15 package program. Frequency, percentage, chi-square, t test (Paired Samples t test) were used in the evaluation of the data. The level of significance was accepted as 0.05.

Application

A questionnaire on socio demographic characteristics and an achievement test were applied to all students who agreed to participate in the study. Before the simulation application, students were randomly selected and all students were actively involved in the simulation. The same achievement test was reapplied to all students 3 weeks after the application. The data were analyzed.

Table 1

Proces of Aplication

	Pre-Test	Educatıon Process	Post-Test
Group	Student Introductory Questionnaire and Success Test	Simulation Application with the scenario of Nursing Care in Myocardial Infarction	Success Test

Findings

When the introductory characteristics of the students were analyzed, it was determined that 43.8% of the students were 20 years old, 83.3% of them were female, and most of the mothers and fathers (59.6% - 60.4%) were primary school graduates.

Table 2

Educational Characteristics of Students

Educational characteristics	**Number**	**%**
Nursing Preference Status		
I Voluntarily Preferred	29	60.4
I InvoluntarilyPreferred	19	36.6
Liking Nursing Profession Status		
Like	30	62.5
Not Like	18	37.5
Effective Method in Learning		
Direct Instruction	6	12.5
Discussion	20	41.7
Question-Answer	10	20.8
Demonstration	21	43.8
Demonstrate-Apply	15	31.3
Sample Case	29	60.4
Practice	35	72.9
Self Learning	7	14.6
The Status of Having Knowledge about Simulation Before		
Yes	33	68.8
No	15	31.2
The Efficacy of Simulation in Nursing Education		
Yes	44	91.7
No	4	8.3

60.4% of the students stated that they preferred the department of nursing voluntarily and 62.5% of them sated that they like the nursing profession. The students stated that the most effective teaching methods in nursing education were practice (72.9%), sample case (60.4%), demonstration (43.8%), discussion (41.7%) and demonstrate-apply (31.3%), respectively. 91.7% of the nursing students stated that simulation is a useful method for nursing.

Table 3

The Comparison of Pre-Test Post-Test Total Success Scores within the Scope of İnternal Medicine Nursing Course (N:48)

	The Means of Total Success Scores	± x̄-ss	Statistical Analysis (t)	Significance (p)
Pre Test	44.22	21.55±3.11	-7.388	.000
Post Test	63.77	16.75±2.41		

When Table 3 is analyzed, total success test scores of the students related to myocardial infarction were determined as 44.22 before simulation education and 63.77 after simulation education. According to the statistical analysis, the difference between pre-test and post-test results was statistically significant (p<0.05).

Table 4

Comparison of Educational Characteristics of Students with the Efficacy of the Simulation (N:48)

Introductory Characteristics	The İndividuals Who Think That Simulation is Effective		Analysis	*p*
Age	Number	%		
19 years old	14	87.5	X^2=0.218	p=0.530
20 years old	20	95.2		
21 years old	8	88.9		
22 years old	2	100		
Gender				
Female	37	92.5	X^2=0.218	p=0.530
Male	7	87.5		
Nursing Preference Status				
Voluntarily	28	96.6	X^2=2.289	P=0.164
Involuntarily	16	84.2		
Liking Nursing Profession Status				
Like	30	100	X^2=7.273	p=0.016*
Not Like	14	77.8		
The Status of Taking Knowledge about Simulation Before				
Yes	28	84.8	X^2=2.537	p=0.111
No	15	100		

When the introductory characteristics of the students were compared with the efficacy of simulation (Table 4), a statistically significant correlation was found between the liking nursing profession status and the individuals who think that simulation is effective (x^2= 7.723, p<0.05). No statistically significant correlation was found between age, gender and nursing preference status of the students.

In our study, no statistically significant difference was found between the introductory characteristics of the students in terms of age, gender, mother-father education status, nursing preference status, liking nursing profession status, effective learning method in learning, the efficacy of simulation for nursing education and the difference between the success test scores before and after the simulation education (p>0.05).

Discussion

The use of simulation in nursing education provides the active participation of the students in education. With the simulation technique, the student learns not only the complex patient scenario, but also has the opportunity to practice the real situation (Rhodes & Curran, 2005). In addition to this, it allows that the students are able to apply what they learn recently in a comfortable and supportive environment, it allows an improve in their performance, and it allows to gain experience without feelings such as anxiety, fear of making mistakes, lack of confidence (Alinier, 2007). In the study of Hope, Garside, and Prescott (2011), nursing students stated that the simulation is useful for humanistic and problem-solving and that it provides technical skills, psychomotor development and trust. Özkal and Çayır (2016) stated that simulation is effective to gain technical and intellectual skills in a safe, controlled environment and to provide effective learning. In our study, it is thought that the results of the simulation of Hope et al. (2011), Özkal and Çayır (2016) 's studies, which simulate the academic success and positive effect of the simulation, are thought to be influential.

In the study of Becker, Rose, Berg, Park, and Shatzer (2006), they compared simulated patient and traditional method. The students assessed the contribution of the education with simulated patient to learning as too effective. In another study, it was stated that education with a simulated patient contributed positively to learning experiences of the students while it contributed negatively to learning experiences of the students in only one study according to a 10-year literature review of simulated patient use (Bremner, Aduddell, Bennett, & VanGeest, 2006). Roche, Schoen, and Kruzel (2013), two different methods were used in the training of new graduated nurses, orientation to the hospital, communication skills, emergency care practices, and evaluation. At the end of the training there was no difference between simulation and classical education. Karadağ et al. (2015) reported that education with a simulated patient makes more contribution to determine the nursing diagnosis and to the planning of interventions. In another study, it was reported that the mean scores for the determination of nursing problems and nursing care of the group which was trained with the simulated patient were higher than the conventional education group (Yoo & Yoo, 2003). McCormick, Slavy JR., and Fuller (2013) compared the traditional education and simulation with the approach to the parkinsonian patient, and as a result, the technological developments have a positive contribution to the education, and it is emphasized that these types of comparisons are used to guide instructors. In our study, the increase in the knowledge test after the simulation supports the previous studies, and most of the students stated that simulation was useful. It is thought that this thinking enhances the readiness of the students, which in turn affects academic success positively. While the majority of the simulation training on the students is positive development, it is stated that there is no difference in the graduate nurses and it is thought that the reason for this is negatively affecting the adaptation which is education. On the other hand, testing of the technological developments included in nursing education with such studies, finding out deficiencies and delivering solutions will ensure that current and more qualified nursing education is given.

In the study of Robinson-Smith et al. in 2009, it was stated that the students figured practice with a simulated patient as funny and informative. In the study of Ebbert and Connors in 2004, it was stated that simulation is realistic and useful. In our study, the nursing liking situation, it seems that the simulation is beneficial in the positive direction. The situation of loving the profession, it is thought that the perspective of the educational activities that are being done is also influenced positively.

Conclusion and Recommendations

The use of simulation in nursing education makes important contribution to transformation of knowledge to skill, enables the application to be made in a secure and controlled environment, the evaluation and immediate correction of errors. At the same time, the simulation gives an opportunity to the students to practice many applications that they can not do in the real clinical environment, as a result it was thought that it provides an opportunity to learn by experience. The integration of the simulation into the nursing education in the direction of these results is thought to increase the student's success in the positive direction.

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