ORIGINAL ARTICLE

Effect of simulation-based learning on first clinical day stress and anxiety levels of nursing students in Turkey

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Abstract

Objective: To determine the effect of simulation-oriented skills training on first clinical day stress and anxiety levels in nursing students.

Methods: The quasi-experimental study was conducted from April to June, 2016, in Istanbul, Turkey, and comprised first year nursing students who were divided into two groups. In Group 1, students measured vital signs on simulated patients before their first clinical practice. In Group 2, the students performed this application on each other. Then, on the first day of their clinical practice, the students evaluated the vital signs and then filled out Clinical Stress Questionnaire and the State-Trait Anxiety Inventory. Data was analysed using Number Cruncher Statistical System version 2007.

Results: Of the 41 subjects, 16(39%) were in Group 1 with a mean age of 19.31±3.2 years, and 25(61%) were in Group 2 with a mean age of 18.92±0.86 years ($p>0.05$). There was no significant differences in state-trait anxiety inventory and clinical stress questionnaire scores between the groups ($p>0.05$). There was a significant difference with respect to benefit subscale of the clinical stress questioaanire ($p=0.049$).

Conclusion: The use of simulation in nursing education provided relief and confidence during clinical practice.

Keywords: Anxiety, Clinical practice, Nursing student, Simulation, Stress.

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Introduction

Nursing education is a stressful process in general and clinical practice areas, which are inevitable in the development of basic knowledge and skills, and are one of the important stress sources of students during the education process.[1-5] As long-term and uncontrollable stress may reduce success and efficiency in students' educational experience, it can also lead to psychological and mental deterioration.[1,6] In clinical practice, it is stated that students intensely experience the fear of making mistakes and having little confidence in themselves.[2,5,7] Students need to be supported with innovative training methods to reduce their fear of clinical practice and improve their self-confidence.

Simulation, which is one of the most effective teaching methods for giving cognitive and psychomotor behaviours to students, allows the students to gain artificial or virtual experience without taking the risk of a real situation.[8] Simulation contributes to the development of both cognitive and dynamic skills by allowing students to experience clinical situation in a realistic learning environment. There are many types of simulations used in health education. These are partial task trainers, low-tech simulators, simulated patients, screen-based computer simulators, complex task trainer and full-scale simulation with medium to high fidelity.[9,10]

Simulated patients are stated to be among simulators cosest to actual patients.[7] Simulated patients are often used in the development of basic communication skills, taking medical history and physical examination.[11] In trainings, repetitive experiences are created with simulated patient use and students can show active participation. These activities can provide safe practice opportunity by reducing the students' anxiety without a risk of threat.[12]

In simulated patient interviews, students gain experience similar to clinical environment, and simulated patient use is beneficial in improving communication skills.[13-15] Nurse educators recommend improving laboratory practices to reduce students' pre-clinical anxiety levels and improving skills by giving simulations a place in practices.[3,8]

There has been limited research investigating the effect of simulation practice on the level of stress and anxiety experienced by the students. The current study was planned to determine the level of stress and anxiety experienced by nursing students during their first clinical practice and to identify the effect of teaching with simulation on their stress and anxiety levels.

Subjects and Methods

The quasi-experimental prospective study was conducted from April to June, 2016, in Istanbul, Turkey, and comprised first year nursing students at a foundation university. The pretest-posttest design was adopted to demonstrate

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causality between the intervention and its outcome.[16] After approval from the institutional ethics committee, all first year nursing students were approached which is called the full count method.[17]

Students who had graduated from vocational school of health and associate degree programmes because of their previous experience, and students who did not undertake the first experience of taking vitals under the supervision of researchers during clinical practice were excluded. The students were divided into two groups by simple random method using Random Allocation Software 2.0.0. Students, measured vital signs with a simulated patient were in Group 1, and students who performed the measurement of vital signs by applying to each other were in Group 2. Post-hoc power analysis was performed to check the sample size after the study and it was found to be sufficient at 0.9618851 power score.[18]

Simulated patient was used during the simulation scnerio. Before the scenario, the patient room was simulated with the same quality as the hospital room. The degree to which a simulated experience approaches reality, fidelity and realism increases proportionately.[19] Students were asked to carry out their expected skills in line with the scenario objectives.

In the context of simulation scenario, students were asked to communicate with the patient, measure and record the vital signs including blood pressure (BP), pulse, respiratory rate and body temperature. Scenario implementation was planned to last for 10 minutes for each student. Pre-briefing stage and 45 minute debriefing stage were carried out. During the debriefing phase, sessions with 8-10 students were held.

After this application, on the first day of practice, students who would evaluate the vital signs in a case for the first time were asked to fill out the State-Trait Anxiety Inventory (STAI)[20] and the Pagana Clinical Stress Questionnaire (CSQ)[21] before entering the case rooms.

Data was collected with descriptive characteristics form (DCF), STAI and CSQ. Considering the fact that students may experience anxiety independently from the clinical practice, the Trait Anxiety Inventory (TAI) was administered to both groups in order to determine their constant anxiety levels before applications (pretest).

Data collection was carried out by 5 faculty members and staff in charge of clinical practice within course. During clinical practice, all students were accompanied by a guiding faculty member while evaluating the vital signs of a case, and students were requested to fill the relevant data collection tool after the application (posttest).

The DCF consisted of 6 questions about age, gender, school preference order, clinical practice area, average success and preference of profession.

The validity and reliability study of STAI was carried out in 1977 in Turkey and it is frequently used in similar studies in the country.[20] There are two types of statements in STAI. Direct expressions indicate negative emotions and reversed expressions indicate positive emotions. Once total weight of direct and reversed expressions are separately found, total weight score of reversed expressions are subtracted from the total weight score of direct expressions. A predefined and unchanging value is added to this number. This unchanged value is 50 for State Anxiety Inventory (SAI) and 35 for TAI. the last obtained value is the anxiety score of the individual.

Turkish validity-reliability of CSQ was done in 2008, and it consists of 20 items evaluating the emotions of threat, challenge, harm, and benefit. The threat scale has six emotions; worried, anxious, overwhelmed, apprehensive and fearful. The challenge scale includes seven emotions; stimulated, exhilarated, hopeful, pleased, eager, excited and happy. The harm scale includes angry, sad, guilty, disgusted and disappointed emotions, while the benefit scale has two emotions; relieved and confident.

In this Likert type scale, each item is scored from 0 to 5 (0- "not at all", 1- "slightly", 2- "moderately", 3- "very", 4- "extremely") and total score ranges from 0 to 80. An increase in the score indicates high level of stress. Cronbach alpha value of the scale was reported as 70 in the Turkish validity reliability study.[21]

Data was analysed using the Number Cruncher Statistical System (NCSS) 2007 software. In the evaluation of data, independent t test was used for comparison of groups, paired t test was used for evaluating measurements before and after the application, and chi-square test was used for comparison of qualitative data as well as descriptive statistical methods. Results were evaluated at $p<0.05$ significance level.

Results

Of the 59 stuents approached, 41(69.5%) were included. There were 16(39%) in Group 1 with a mean age of 19.31±3.2 years, and 25(61%) in Group 2 with a mean age of 18.92±0.86 years ($p>0.05$). The overall mean TAI scores were 45.94±5.26 in Group 1 and 47.28±4.13 in Group 2. There were no significant differences between the groups for age, gender, TAI levels, place of residence, education status, and preferance status for the department (Table 1).

On the day of clinical practice, students' mean CSQ scores were 30.63±10.87 in Group 1 and 31.2±11.85 in Group 2

Table-1: Distribution of Nursing Students' Descriptive Characteristics (n=41).

Characteristics	Experimental Group Group-1	Control Group Group-2	p-value
Age	19.31±3.2	18.92±0.86	0.562
General Weighted Grade Average	2.79±0.61	2.5±0.35	0.064
Preference Order	5.63±8.36	2.48±3.85	0.110
Trait Anxiety Scores	45.94±5.26	47.28±4.13	0.367
	Group-1 n (%)	Group-2 n (%)	
Gender			
Female	12 (75)	21 (84)	0.478
Male	4 (25)	4 (16)	
Place of Residence			
City	13 (81.25)	22 (88)	0.551
State	3 (18.75)	3 (12)	
Education Status			
Classic High School Graduate	5 (31.25)	3 (12)	0.121
Anatolian High School Graduate	11 (68.75)	22 (88)	
Preference Status For the Department			
Own choice	12 (75)	22 (88)	0.281
At the request of family	4 (25)	3 (12)	
Status of Liking the Profession			
Likes	14 (87.5)	24 (96)	0.308
Dislikes	2 (12.5)	1 (4)	
Total	16 (39.02)	25 (60.98)	

Table-2: Students' Clinical Stress Questionnaire Mean Total and Subscale Scores On the Day of Clinical Practice (n=41).

Clinical Stress Questionnaire	Group 1 Mean ± SD	Group 2 Mean ± SD	p-value
Total	30.63±10.87	31.2±11.85	0.876
Threat Subscale	5.5±4.91	5.44±4.72	0.969
Challenge Subscale	14.19±6.52	13.88±5.56	0.873
Harm Subscale	5.69±2.98	6.96±3.59	0.245
Benefit Subscale	5.25±2.27	4.92±2.75	0.691
State Anxiety Score	39.38±4.87	39.6±3.77	0.869

*p<0.05 SD: Standard deviation

Table-3: Mean Score of Clinical Stress and State Anxiety Score Before the Simulation and Before the Clinical Practice For Students in Group 1 (n=16).

Scale Dimensions	Prior to Simulation Mean ± SD	On the Day of Clinical Practice Mean ± SD	p-value
State Anxiety Score	40.13±4.83	39.38±4.87	0.409
Clinical Stress Total Score	29.31±10.71	30.63±10.87	0.583
Threat Subscale	6.44±4.72	5.5±4.91	0.335
Challenge Subscale	11.88±5.02	14.19±6.52	0.135
Harm Subscale	7.19±4.13	5.69±2.98	0.119
Benefit Subscale	3.81±2.14	5.25±2.27	0.049*

*p<0.05 SD: Standard deviation

(Table 2). Likewise, mean SAI scores were 39.38±4.87 and 39.6±3.77 in Groups 1 and 2, respectively (p>0.05). There was a significant difference only with respect to the benefit subscale of CSQ (p=0.049) (Table 3).

Discussion

Students are faced with many situations that cause anxiety and stress during the nursing education.[1,2] Nursing education aims at transfering theoretical knowledge to clinical practice, and the nurses might cope with stress during this period. For this purpose, in nursing education, clinical practice areas are also intensively used as well as laboratory studies. While clinical practice areas improve the cognitive, affective and psychomotor skills of students, it provides the professional socialisation of student at the same time.[4,21]

Anxiety and stress levels of nursing students might increase in clinical practice due to fear of making mistakes and causing harm to patients, while insufficient level of knowledge and skills might lead to communication problems with patients.[1,22] High-level stress may affect the academic performance of nursing students. To decrease stress, especially first experiences of clinical practice, simulation models might be used in nursing education. Simulation models represent a new era in nursing education programmes.

Nursing students take steps to clinical practice education with existing stress and anxieties. Nursing students' anxiety and stress levels are higher on the first day of their clinical practice compared to other periods.[23] While mild anxiety is motivating in education, anxiety levels may increase due to problems experienced in clinical practice. Therefore preparing the nurse students for clinical practice is very important.[24] Methods to reduce existing stress and anxiety is very important for educators to increase the targeted achievement of students. Turkish nursing students' stress levels in clinical practice were found to be higher than the stress levels achieved in studies conducted using the same scales in other countries.[25] The current study evaluated the effects of simulation programme on the first day of clinical experience of students. In the study, total scores of CSQ determined on the clinical practice day of nursing students were found to be at moderate levels. Nursing students' age, gender, place of residence, preference order and educational status did not affect their anxiety and stress levels. This situation can be explained by the fact that most of the nursing students loved their profession (92.7%) and therefore they prepared themselves for the education process. Also in our study, CSQ mean subscale score of students who chose their profession at will were significantly higher in "threat", "challenge" and "benefit" subscales. This condition might be associated with higher expectation of students who have the aim of being sensitive to the profession and being a good healthcare professional in the future, and their clinical stress levels may increase compared to other students because of their effort for self development. Similarly, the "challenge" subscale of regular high school graduates was significantly higher than

Anatolian high school graduates in the current study. This result is usual considering the education and success grades of nursing students in high school.

In nursing education, simulated patient method is used to develop skills such as communication, interview and diagnosis.[26] Simulated patient use in nursing education allows the student to go through a realistic clinical learning experience in a structured simulated environment and learn nursing skills effectively before being in the clinical setting.[27] Students might integrate what they learn about patient care and management of clinical situations with practice as during the simulation, they might encounter situations that can be experienced in the hospital.[27] Simulation training with simulated patient reduces anxiety and stress that may occur prior to clinical practice.[7,23,28,29] Thus, simulation positively contributes to the learning process of students.[7] Karadag et al.[27] reported that students provided feedback as "provides effective learning" at the end of the education applied with simulated patient method. However, Bremner et al.[30] could not find any significant difference in anxiety levels of students. Similarly, in our study, no statiscally significant difference was found between STAI and CSQ scores of students in the two groups. However, statistically significant difference was found in the "benefit" subscale of CSQ belonging to nursing students receiving education with simulated patient. In accordance with these results, students receiving education with simulated patient perceived clinical practice environment more beneficial than 'threat' environment. This result is thought to be due to the similarity of education with simulated patient to clinical practice environment and communication with a real patient before going out for clinical practice. In terms of limitations of te current study, the planning state of the research, the results and generalisations apply only to thr study sample and not to the entire population.

We believe that the study will guide the researchers since there are limited number of studies on the subject avaiable.

Conclusions

The use of simulation in nursing education provided relief and confidence during clinical practice. Simulation strategy can decrease clinical stress and anxiety.

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