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The effect of simulation based education on patient teaching skills of nursing students: A randomized controlled study

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ABSTRACT

According to the literature, main problem in the education of nursing students in patient teaching about application of inhaler medication is ineffective and inadequate class and cannot be applied to the live patients. Also the literature shows that the main obstacle for teaching nursing students to provide inhaler instruction is inadequate in-class practice.

In this study, comparison of the effectiveness between standard patients (SPs) usage and theoretical lecture on improving the patient teaching skills of nursing students for inhaler drug use for live patient is aimed.

This study was conducted as a randomized controlled and single-blind trial. Total patient teaching skill score for control group was 26.73 ± 5.63 and 39.08 ± 5.49 for SP group which causes a statistically significant difference ($p \leq 0.01$). The students' self-confidence mean score was 8.48 ± 0.88 for SPs group and 7.07 ± 1.33 in the control group for a statistically significant difference ($p \leq 0.01$). The patient teaching skill scores of the students included in the group receiving simulation teaching with the SPs were found to be higher than the control group. The students included in SPs group were found to feel more confident while teaching a live patient on inhaler drug use.

Introduction

Chronic diseases of the respiratory system are considered to be important diseases which cause serious morbidity and mortality in the world (Ozpulat & Yildirim, 2014). According to World Health Organization, in 2016, the prevalence of Chronic Obstructive Pulmonary Disease (COPD) is 251 million, and it is reported that COPD causes 3.17 million deaths every year (WHO, 2017). The increase of the prevalence of COPD in the next 30 years due to the growing number of smokers in developing countries and the increasingly aging population in developed countries, is anticipated. Deaths from COPD and related causes will be 4.5 million every year by 2030 (Turkish Thoracic Society's View of the GOLD, 2017). In the examination of mortality rates among all causes of death in Turkey, respiratory diseases take the 3rd place with 11.9%. Cardiovascular diseases are in the first place (39.8%) and malignant neoplasms are in the second place (19.7%) (Turkey Statistical Institute, 2016).

Asthma and COPD guidelines are largely based on pharmacological treatment with inhaler medications (Kang-Hua, Chien-Ying, Lotus, Yeh, & Shu-Ling, 2016; Melani et al., 2011). Inhaler bronchodilators in COPD are in the basis of the therapy and are often used to prevent or reduce symptoms. Also, inhaler bronchodilator treatments should be preferred to oral bronchodilator treatments. However, it is pointed out that improper and excessive use of drugs in COPD in Turkey is very high (Turkish Thoracic Society's View of the GOLD, 2017). According to a study conducted in Turkey, to examine the inhaler using skills of COPD patients and asthma patients, the rate of good application of techniques were found to be 33% in metered dose inhalers (MDI), 53% in turbuhalers and 50% in discus type devices (Cam & Gocemen, 2006).

The effectiveness of the inhalation drugs that constitute the most important part of the treatment of respiratory tract diseases depends on the proper administration of the required dose of the drug to the bronchial mucosa. However, many studies have revealed that patient mistakes are common during the usage of inhaler drugs (Batterink, Dahri, Aulakh, & Rempel, 2012; Hale, Costello, & Cowman, 2014; Sestini et al., 2006; Takemura et al., 2010). The main limitation in the effective usage of inhaler drugs is the patient's inability to use the inhalation devices correctly (Aydemir, 2015). This reduces patient compliance to the treatment, especially in COPD. As a result, disease control cannot be ensured, excessive drug is used, more side effects are experienced, frequent acute episodes are seen, the hospitalization rate is high, and there is an extra burden on health expenditures (Poudel, Shrestha, & Piryani, 2016).

Using inhaler devices is difficult and requires very good teaching of

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the patients. Inadequate patient teaching leads to the inability of patients to use the inhalant correctly and increases the mortality and morbidity of respiratory diseases (Basheti et al., 2015). However, patients often report that healthcare professionals do not teach them the correct usage of inhaler drugs (Hale et al., 2014). Patient mistakes have been reported to decrease after patient teaching on inhaler drug use in the literature. Choi and Cho Chung (2011) found an increase in the ability to use inhalers after they provided teaching on inhaler drug use to 101 asthma patients. Press et al. (2012) found that 82% of the COPD patients administered the inhaler using incorrect steps before the teaching and this rate decreased to 25% after the teaching.

Nurses have been reported to be the most suitable healthcare professional for teaching the patient for inhaler drug use (Lareau & Hodder, 2012; Tratto et al., 2014). However, studies have shown that even the nurses do not have sufficient knowledge on inhaler drug administration. A study showed that 30% of nurses working at the hospital did not use the inhalers correctly (Lalani, 2012). Determining the gaps in nursing knowledge, regarding appropriate inhaler device usage for patient teaching and to planning the necessary interventions are very important.

One of the reasons for the deficiency of nurses' education on inhaler device usage is that they are not given a proper education before graduation (Tratto et al., 2014). Basheti et al. (2015) found that the main obstacles for inhaler teaching are inadequate in-class practice lack of practice on live patients in their study.

Ensuring competency of student nurses in the use of inhaler drugs during the pre-graduate period is quite important for the success of post-graduate practices. Nurse educators should use simulation based education which is one of the most appropriate teaching techniques. One of these teaching techniques is the using standardized patients (SPs).

Using SP is a teaching method in which the educator plays a facilitating role in a student-centered and controlled environment. The International Nursing Association for Clinical Simulation and Learning (INACSL Standards Committee, 2016f) defined a SP as “a person trained to consistently portray a patient or other individual in a scripted scenario for the purposes of instruction, practice, or evaluation.” SPs allow simulated live patient interviews by presenting the same scenario and SPs provide a reliable way of teaching and evaluating each student. One of the advantages of the use of SPs for teaching is ensuring evaluation of the students objectively (Becker, Rose, Berg, Park, & Shatzer, 2006; Bosek, Li, & Hicks, 2007; Yoo & Yoo, 2003).

Although SPs have been used as a learning and evaluation tool in medical education since the early 1960s, its use in nursing education is relatively new (Bornais, Raiger, Krahn, & El-Masri, 2012). Studies have shown that SP is used effectively in medical education to improve communication skills and clinical knowledge, and to teach psychomotor skills (Jin & Choi, 2018; Hsu, Chang & Hsieh, 2015). Similarly, SP has been shown to be effective in the development of psychomotor skills such as blood pressure measurements in nursing education (Bornais et al., 2012; Gibbons et al., 2002). The use of SP in nursing education has also been reported to increase the communication skills and self-confidence of the student to encourage critical thinking, cultural competency and patient-centered care and to help coping with stress and anxiety (Ha, 2018; Hsu, Chang, & Suh-Ing, 2015; Ndiwane, Koul, & Theroux, 2014; Slater, Bryant, & Ng, 2016; Webster, 2014).

The aim of the study is to compare the effectiveness of SP and theoretical lecture in terms of improving the patient teaching skills of nursing students in inhaler drug usage for live patient teaching. Although the effectiveness of SP using method has been shown in many studies, any study evaluating its effectiveness in inhaler drug usage teaching could not be found.

Methods

Design

This study is conducted as a randomized controlled, single-blind trial between April, 15th 2017 and June, 30th, 2017.

Two hypotheses were formed for this study:

(1) The SPs group will have significantly higher clinical performance scores for patient teaching related to inhaler drug administration than the students in the control group.
(2) The self-confidence scores of the SPs group will be significantly higher than those in the control group while providing patient teaching for inhaler drug administration.

Population and sample

This study is conducted with the 2nd year students ($n = 132$) of a nursing school. All the students were female and the mean age was 19.50 ± 0.57 years. Inclusion criteria for the study were (1) voluntary acceptance of study participation, (2) to be participated in theoretical and practical teaching of inhaler drug use included in the second-year curriculum program, (3) a planned rotation in the clinical practice teaching program at the department of Chest Diseases.

71 students, meeting the study inclusion criteria, are included to the study population. These 71 students were randomly grouped for the study and control groups by a computer program. (https://www.e-picos.com/apps/calculation/rapg). For the power analysis of the study, the mean and standard deviation values of the performance scores of the groups (control group: 26.73 ± 5.63, SPs group: 39.08 ± 5.49) were used and the Type-1 error was calculated as 5%. The calculated power was $(1 - \beta) = 1$.

(http://www.e-picos.com/apps/power/powers.php?id=tisg_c).

Setting

The design, implementation and evaluation of the Simulations, conducted in this study were based on the standards published by the International Nursing Association for Clinical Simulation and Learning Standards Committee (INACSL Standards Committee, 2016a,b,c,d,e).

A scenario, suitable for the backgrounds of the students included in the study, was prepared considering their curriculum. Scenario learning objectives are shown in Box 1.

Two SPs with similar socio demographic characteristics and disease history were used in the scenario. A meeting with the SPs was held

Box 1
Learning objectives.

- Maintain appropriate communication during patient teaching
- Use a clear and understandable language when communicating with the patient
- Explain to the patient how to use the inhaler device
- Demonstrate how to use the inhaler device correctly to the patient
- Pay attention to patient teaching principles regarding inhaler drug use
- Request feedback from the patient for the teaching

three days before the simulation. SPs were informed about the scenario, their roles, responsibilities, the tips to be used in the scenario and consistency was ensured at this meeting. In addition, a pilot study was conducted with SPs one day before the simulation.

Inhalation treatment is usually performed with inhalers. The most common inhalers are pressurized metered dose inhalers, dry powder inhalers, Turbuhaler and Diskus type inhalers, and other similars to Flexhaler (Basheti, 2014). Turbuhaler and Diskus devices were used in this study. A COPD patient who started the treatment with Turbuhaler and Diskus devices was impersonated in the simulation. Patient education room in the chest diseases outpatient clinic was used for this study and inhaler drugs and teaching guidelines were placed for use in the demonstration. This clinic is visited by nearly 35.000 patients a year.

Data collection tools

Student Satisfaction and Self-Confidence in Learning Scale (SSSC)

The original version of the scale which was developed by Jeffries and Rizzolo (2006) has 13 items. The total number of items was decreased to 12 items during adaptation to Turkish. The Turkish validity and reliability study was conducted by Unver et al. (2017). The scale is a 5-point Likert-type scale which includes the "satisfaction with current learning" and "self-confidence in learning" subcategories. The satisfaction with current learning subcategory consists of 5 items and the self-confidence in learning subcategory 7 items. A higher score on the scale indicates increased student satisfaction and self-confidence. While the Cronbach alpha value of the scale for "satisfaction with current learning" was 0.85, it was 0.77 for "self-confidence in learning. The total scale Cronbach alpha value was 0.89 in this study" (Unver et al., 2017). In our study the total scale Cronbach alpha value was 0.88.

Simulation Design Scale (SDS)

The original version of the scale was developed by Jeffries and Rizzolo (2006). The Turkish validity and reliability study was conducted by Unver et al. in 2017. SDS consists of 20 items in the 5 subcategories of: "objectives and information", "support", "problem solving", "guided reflection or feedback" and "fidelity". The "Objectives and information" subcategory has 5 items, the "support" subcategory has 4, the "problem solving" subcategory has 5, the "guided reflection or feedback" subcategory has 4, and the "fidelity" subcategory has 2 items. The total Cronbach alpha value of the scale is 0.90. The scale is evaluated in 2 sections. In the first section, possibility of the application of the best simulation design elements is evaluated. In the second section, the importance of the simulation design elements for the students is evaluated. The first section is evaluated using "Definitely disagree", "Disagree", "Undecided", "Agree" and "Strongly agree" for each expression. The second section is evaluated as "not important", "Partially important", "Undecided", "Important", and "Very important". Cronbach alpha values of the subcategories of the scale were 0.77, 0.73, 0.76, 0.75, and 0.86, respectively. The total scale Cronbach alpha value was found to be 0.90 in this study (Unver et al., 2017). In our study the total scale Cronbach alpha value was 0.86.

Evaluation performance checklist of patient teaching skills of the students

This checklist was created by the investigators based on the literature and contained teaching steps on inhaler drug administration. While the checklists were being developed, the opinions of three nurse educators who were experts in their field and working at different universities were obtained. In addition, pilot studies were performed on 10 students, not included to the study. This checklist consisted of 15 procedural steps and each step was evaluated as 0: not performed, 1: insufficient/weak, 2: moderate, 3: good. The checklist had the three subdimensions of "communication", "demonstration" and "feedback". The minimum score possible was 0 and the maximum score was 45.

Feedback form

This form is semi-structured and consists of 5 questions. One of the questions is about how students, who was evaluated using a visual analogue scale, perceive their self-confidence during teaching with a live patient. A 10 cm scale with "very inadequate" written on one end and "very good" on the other was used. Other questions concerned student experiences during and after the patient teaching. What was felt during the patient teaching, the physical reactions, the difficulties experienced, and the contribution of theoretical education to the experience with a live patient were queried with these questions.

Data collection procedure

This study was carried out in three stages.

Stage 1: A total of 2 hour theoretical and 2 hour practical teaching on the use of inhaler drugs was provided to all students included in the study. Demonstration and video display techniques were also used for this purpose. The principles of patient teaching on the use of inhaler drugs were also explained. After the theoretical course, students were divided into two as the intervention and control groups using a randomization method (Fig. 1).

Stage 2: While the intervention group is taking simulation application, regular curriculum lesson is applied to the control group.
Intervention Group (SPs): All students in the intervention group received simulation practice individually after undergoing pre-briefing on the scenario. A time period suitable for the student was scheduled for the simulations to be carried out. Each simulation lasted for approximately 20 min, followed by an average of 40 min of debriefing. The plus delta method was used as the debriefing method. Immediately after the debriefing session, students were asked to evaluate the simulation performed, with "SSSC" and "SDS". It took about 10 min to complete these scales.
Control Group: Planned curriculum lecture is applied to the control group.

Stage 3: During the clinical practice, the students' performances and their feedback about the practice were evaluated.

Approximately 1 week after the simulation, the students, consisting of thirteen subgroups with mixed control and intervention group subjects, were taken to clinical practice teaching at the chest diseases unit during usual rotation in the curriculum. The clinical teaching of the students was carried out by two instructors between 08.00 and 16.00 for 4–5 days on average. The students were asked to realize their clinical practice goals and provide inhaler drug usage teaching to a patient. The checklist was given to students in advance so that they all know how they would be evaluated.

A suitable room in the chest diseases outpatient department was reserved for patient teaching. An appointment for the patients who need inhaler teaching was determined by the physician according to the students' availability in the clinic. A random chosen student in the clinic was asked to teach the patient. The evaluation of the performance of the students during the patient teaching process was performed by using a checklist by the instructor who did not know whether she was in the control or the intervention group. After the teaching period is over, any detected missing points, were completed by the instructor. Patient teaching on inhaler drugs continued for about 20 min. After the patient teaching, the students were asked to complete the feedback form.

Data analysis

The data were evaluated using the SPSS 21 (Statistical Package for the Social Sciences). Median ± standard deviation was used as descriptive statistics. A Kolmogorov-Smirnov test was used in order to examine the normal distribution of variables. The *t*-test was used to

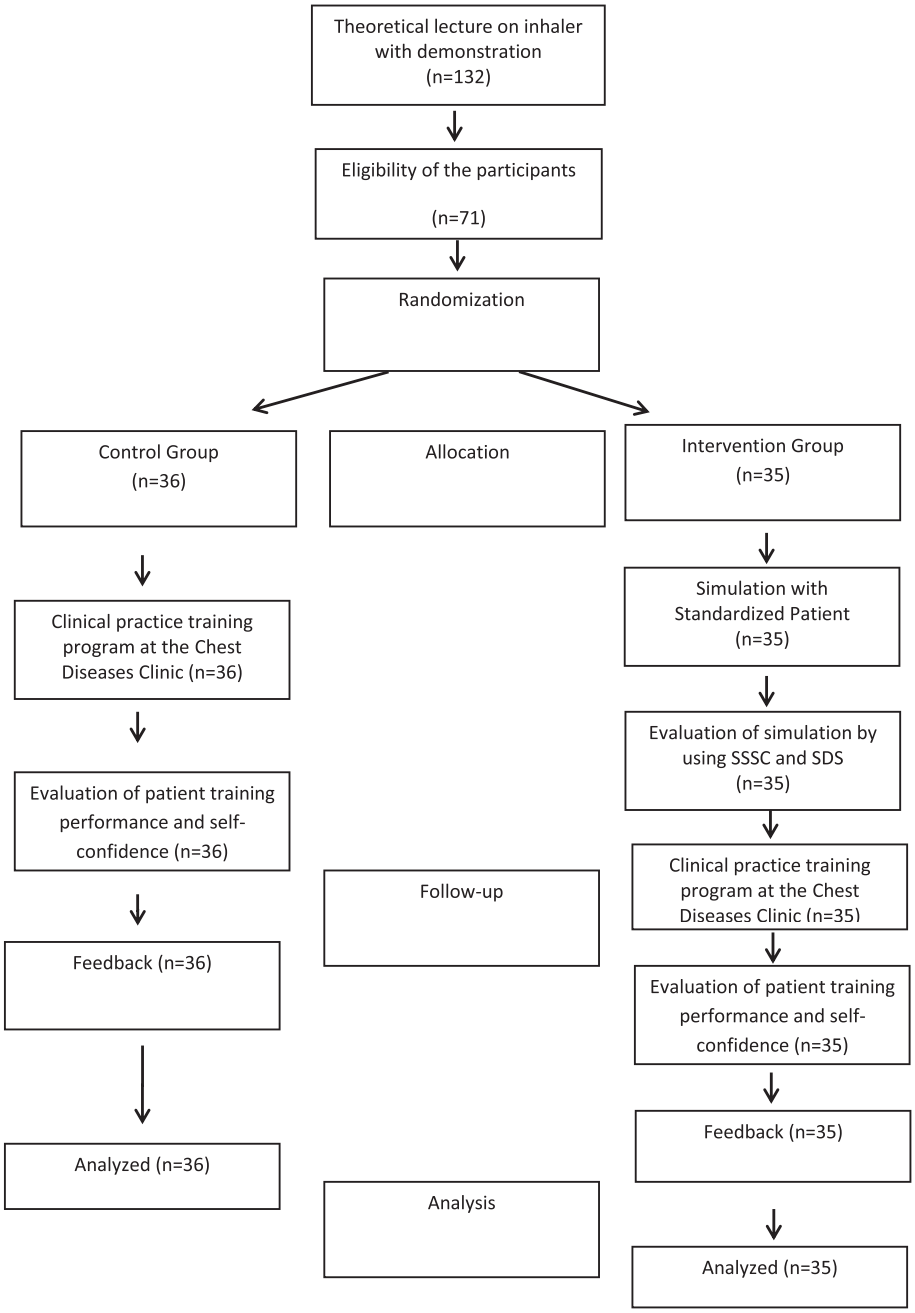


Fig. 1. The flow diagrams of the study.

compare performance scores between the two groups. Correlations were used to show the relationship between self-confidence scores and total patient teaching skill performance scores during the clinical practice of the students. A p value < 0.05 was accepted as a sign of significant difference in statistical decisions.

Ethical considerations

The study protocol was approved by the Ethics Commission of Kecioren Training and Research Hospital in Ankara (April 2017, number 2012 – KAEK – 15/1397) In this study Helsinki Declaration on Human Rights is complied. All students and patients participated in this study are informed about the aim of the study and their roles. Their informed written and oral consent are taken. Students were informed about their academic achievement scores would not be affected in any way due to the participation to the study.

Results

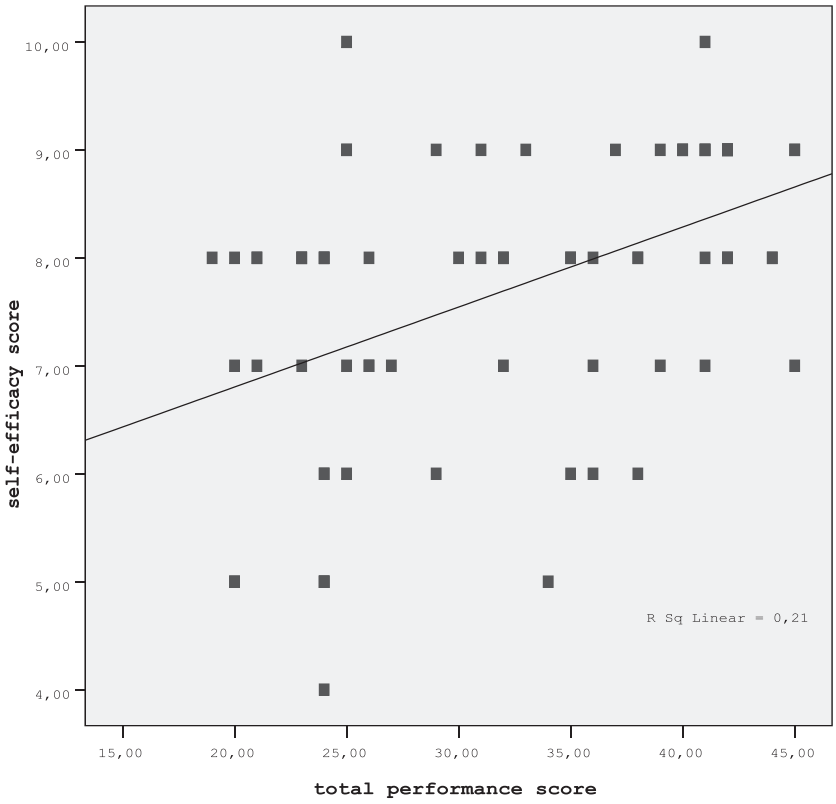
The patient teaching skill total score was 26.73 ± 5.63 in the control group students, 39.08 ± 5.49 in the SPs group and the difference was statistically significant ($t = -9.63, p < 0.01$). The difference between the two groups was also statistically significant ($t = 6.21$, $p < 0.01$; $t = 9.24$, $p < 0.01$; $t = 4.16$, $p < 0.01$) when the scores the students obtained from the communication, demonstration and feedback subscales were compared (Table 1).

When students' self-confidence was evaluated with the visual analogue scale (1 to 10) during patient teaching for inhaler drug use, the mean score was 8.48 ± 0.88 for the students in the SPs group and 7.07 ± 1.33 in the control group and the difference was statistically significant ($t = 5.34$, $p < 0.01$) (Table 1). A statistically significant moderate positive correlation ($r = 0.459$, $p < 0.01$) was found between students' scores of feeling confident while teaching a live patient

Table 1
Comparisons of students' clinical skill total performance and self-confidence scores for patient training according to control and intervention group (n = 71).

	Control group (n = 36)	Intervention group (n = 35)	Statistical tests[a]
	M ± SD[b]	M ± SD[b]	
Communication	5.17 ± 3.39	9.57 ± 2.66	6.21 $p < 0.01$
Demonstration	23.88 ± 3.24	16.14 ± 3.94	9.24 $p < 0.01$
Receiving feedback	4.75 ± 1.19	5.82 ± 1.01	4.16 $p < 0.01$
Total Score	26.73 ± 5.63	39.08 ± 5.49	9.63 $p < 0.01$
Self-confidence Score	7.07 ± 1.33	8.48 ± 0.88	5.34 $p < 0.01$

[a] *t*-Test.
[b] Mean ± Standard Deviation.



Graph 1. The correlation between clinical skill performance scores and self-confident scores of the students.

and the patient teaching skill performance scores (Graph 1).

SSSC and SDS scores of the students regarding simulation implementations performed in the intervention group are shown in Tables 2 and 3. The average satisfaction score was 4.66 ± 0.38, self-confidence score 4.68 ± 0.96, and total simulation design score 4.58 ± 0.43, respectively for these students.

When feedback is given immediately after the patient teaching evaluation, the majority of the students in the intervention and control groups were excited during the practice. The physical reactions experienced in the groups were similar and consisted of symptoms such as mixing the words while speaking, stuttering, talking fast, hands shaking and experiencing palpitation. However, when the emotions while the live patient teaching were evaluated, the students in the intervention group were found to have more positive emotions than the control group. These positive feelings were as follows: not experiencing difficulty during patient teaching, being happy that there is no lack of knowledge, increase in self-confidence, being happy as it was possible to communicate well with the patient, and also, with the simulation teaching with SPs in the class, feeling safe, being comfortable, and feeling and developing self-confidence. When the feelings of the students in the control group were evaluated, negative feelings, such as, regretting for not being able to implement the patient teaching correctly, fearing to say something wrong to the patient, having difficulty in patient teaching, and being sad because of giving incomplete information to the patient, were dominant. The students of the intervention group felt a positive reflection of the simulation teaching performed with SPs on the live patient teaching and expressed satisfaction with experiencing such a practice. They also recommended other course skills practice to be provided through this teaching method. The control group students said they were happy to practice with a live patient, but they also expressed their feelings as "…..*I would not be so excited if I had more practice experience and if I had trained patients previously*…..".

Discussion

For the reason that informing the patients about their illness is difficult, Patient teaching is an important issue for nurses to deal with and constitutes the most important part of nursing practice. For this reason, it is necessary for nurses to prepare for these roles before graduation. Nurse educators should prepare the students for live environments using various learning techniques to ensure effective patient education (Richard, Evans, & Williams, 2018).

Table 2
SSSC scores of the students regarding simulation implementations performed in the intervention group (n = 35).

	M ± SD[a]	Min–Max
Satisfaction with current learning		
1. The teaching methods used in this simulation were helpful and effective.	4.71 ± 0.45	4.00–5.00
2. The simulation provided me with a variety of learning materials and activities to promote my learning the medical surgical curriculum.	4.48 ± 0.56	3.00–5.00
3. I enjoyed how my instructor taught the simulation.	4.71 ± 0.45	4.00–5.00
4. The teaching materials used in this simulation were motivating and helped me to learn.	4.68 ± 0.52	3.00–5.00
5. The way my instructor(s) taught the simulation was suitable to the way I learn.	4.74 ± 0.50	3.00–5.00
Total	4.66 ± 0.38	3.80–5.00
Self-confidence in learning		
6. I am confident that I am mastering the content of the simulation activity that my instructors presented to me.	4.42 ± 0.60	3.00–5.00
7. I am confident that this simulation covered critical content necessary for the mastery of medical surgical curriculum.	4.40 ± 0.69	3.00–5.00
8. I am confident that I am developing the skills and obtaining there quired knowledge from this simulation to perform necessary tasks in a clinical setting.	4.60 ± 0.55	3.00–5.00
9. My instructors used helpful resources to teach the simulation.	4.45 ± 0.50	4.00–5.00
10. It is my responsibility as the student to learn what I need to know from this simulation activity.	4.77 ± 0.42	4.00–5.00
11. I know how to get help when I do not understand the concepts covered in the simulation.	4.45 ± 0.61	3.00–5.00
12. I know how to use simulation activities to learn critical aspects of these skills.	4.57 ± 0.55	3.00–5.00
Total Score	4.68 ± 0.96	3.57–5.00

[a] Mean ± Standard Deviation.

In this study, the effects of simulation implementations, performed by using SPs on the skills of student nurses, teaching live patients on inhaler drug use, were evaluated.

The use of SPs is one of the teaching methods that provides an important opportunity for the students to transfer and integrate their theoretical knowledge with practical (Yoo & Yoo, 2003). SPs allow simulation of live patient interviews in a safe and controlled environment where a controlled and reproducible encounter can occur (Becker et al., 2006; Defenbaugh & Chikotas, 2016). Therefore, using SPs is a reliable method for teaching and evaluation by presenting the same scenario to each student (Bornais et al., 2012). The total score and subscale scores of patient teaching skills on inhaler drug use of the students in the group trained by using SP were higher than in the control group in our study. Students remembered the scenarios they have encountered in teaching and accurately recall successful behavioral strategies (Dwyer, Sear, McAllistera, Guerin, & Friel, 2015). The success of the education with SP is also pointed out in the literature.

Bornais et al. (2012) found that student health assessment performances in the group using SPs to be higher in their study where they evaluated the effectiveness of SPs use in health assessment skills development of nursing students. Unver et al. (2013) found that medication administration performances of nursing students improved in the simulation which they conducted by using SPs. Basheti (2014) found that SPs were found to improve the skills of the pharmacy students on using inhalers significantly in the simulation performed with a live patient. The findings we obtained were similar to these studies.

The self-confidence scores of the students included in the SP group during teaching with a live patient were found to be higher than the students in the control group in our study. A positive relationship was found between the students' “mean scores of performance” and “mean

Table 3
SDS scores of the students regarding simulation implementations performed in the intervention group (n = 35).

	M ± SD[a]	Min–Max
Objectives and ınformation		
1. There was enough information provided at the beginning of the simulation to provide direction and encouragement.	4.28 ± 0.75	3.00–5.00
2. I clearly understood the purpose and objectives of the simulation.	4.80 ± 0.40	4.00–5.00
3. The simulation provided enough information in a clear matter for me to problem-solve the situation.	4.45 ± 0.65	3.00–5.00
4. There was enough information provided to me during the simulation.	4.51 ± 0.65	3.00–5.00
5. The cues were appropriate and geared to promote my understanding.	4.45 ± 0.65	3.00–5.00
Support		
6. Support was offered in a timely manner.	4.22 ± 0.75	3.00–5.00
7. My need for help was recognized.	4.24 ± 0.97	3.00–5.00
8. I felt supported by the teacher's assistance during the simulation.	4.28 ± 0.89	3.00–5.00
9. I was supported in the learning process.	4.37 ± 0.84	3.00–5.00
Problem solving		
10. Independent problem-solving was facilitated.	4.51 ± 0.56	4.00–5.00
11. I was encouraged to explore all possibilities of the simulation.	4.48 ± 0.65	4.00–5.00
12. The simulation was designed for my specific level of knowledge and skills.	4.60 ± 0.49	4.00–5.00
13. The simulation allowed me the opportunity to prioritize nursing assessments and care.	4.68 ± 0.47	4.00–5.00
14. The simulation provided me an opportunity to goal set for my patient.	4.62 ± 0.49	4.00–5.00
Feedback/guided reflection		
15. Feedback provided was constructive.	4.65 ± 0.80	300–5.00
16. Feedback was provided in a timely manner.	4.57 ± 0.81	3.00–5.00
17. The simulation allowed me to analyze my own behavior and actions.	4.77 ± 0.42	4.00–5.00
18. There was an opportunity after the simulation to obtain guidance/feedback from the teacher in order to build knowledge to another level.	4.80 ± 0.40	4.00–5.00
Fidelity (Realism)		
19. The scenario resembled a real-life situation.	4.74 ± 0.44	4.00–5.00
20. Real life factors, situations, and variables were built into the simulation scenario.	4.74 ± 0.44	4.00–5.00
Total Score	4.58 ± 0.43	3.75–5.00

[a] Mean ± Standard Deviation.

scores of self-confidence during patient teaching". This relationship suggests that students who feel more confident during the patient teaching have higher performance scores. This finding indicates a similarity between the instructor and the student in terms of the evaluation and thus supports the reliability of the study.

The SSSC and SDS scores of the intervention group for the simulation were high in the group receiving teaching with SP in our study. The SSSC and SDS scores for high-fidelity simulations were also found to be similarly high in the literature (Basak, Unver, Moss, Watts, & Gaioso, 2016; Keiser & Turkelson, 2017; Koo et al., 2014; Tawalbeh, 2017). Oh, Jeon, and Koh (2015) reported simulations with a SP to affect the self-confidence of nursing students while acquiring clinical skills positively in a meta-analysis study evaluating the effectiveness of simulations using SPs. The students were satisfied with the simulation conducted with SP and it positively affected their self-confidence in our study. Besides, the students' perception of the simulation design was quite positive. Slater et al. (2016) stated that positive student perceptions of simulation design may be due to the realistic experiences provided by SPs.

The most important aim of the nursing education is to make sure that students are ready for the real environment. Nursing students were reported to feel better prepared for live patients after the simulations conducted with SPs in various studies (Andrea & Kotowski, 2017; Slater et al., 2016). Although the intervention and control group students gave similar physical reactions while teaching a live patient on inhaler drug use, the students in the intervention group reported to have more positive feelings about these experiences. Besides, after the study, intervention group students recommended SP method to be used in other courses as an effective teaching method. Similarly, Slater et al. (2016) found the teaching given with the SPs to be preferred by the students as a learning method.

The success of patient teaching depends on how the interpersonal communication skills are used. The students in the intervention group expressed being able to establish a more comfortable communication with the patient in the feedback they provided in this study. SPs make it easier for students to establish communication and increases their skills related to interacting with the patients and thus improves patient care in the literature (Andrea & Kotowski, 2017; Felton & Wright, 2017). It was also found that teaching, performed by using SPs, can help students learn how to use their interpersonal communication skills and develop critical thinking skills (Andrea & Kotowski, 2017). The intervention group students were found to notice a positive contribution of SPs for their communication skills in our study.

Limitations

There were several limitations in this study. First, due to the short clinical practice time in the curriculum, only the performances of the students with a live patient were evaluated. Second, the profiles of the live patients that required teaching were not standardized for all students in the teachings conducted. Third, the teaching skills of the students could only be evaluated for discus type and turbo inhaler devices.

Conclusion

This is the first randomized controlled study evaluating the effectiveness of SP use in improving skills of nursing students in patient teaching for inhaler drug use. This study is also valuable as it demonstrated in a short term that the gains of SP usage had positive effects on live patients teaching. The patient teaching skill performance scores of the interventions students found to be higher than the control group. The students included in SPs group were found to feel more confident while teaching a live patient on inhaler drug use. In addition, the students in the SPs group provided positive feedback regarding their real life experiences.

The use of SPs may be a valuable method for increasing pre-graduate nurses' competence related to patient teaching skills for inhaler technique and transferring their theoretical knowledge to clinical practice. Researchers recommend nurse educators to use the SPs in providing patient teaching skills for inhaler drug use.

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None.

Conflict of interest statement

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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