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Effectiveness of pediatric nursing simulation practices: The students' views and recommendations to improve

Pediatri hemşireliği simülasyon uygulamalarının etkinliği: Öğrencilerin görüşleri ve geliştirmeye yönelik öneriler

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ABSTRACT
Purpose: The purpose of the study was determination of the opinions of the nursing students about the effects of the simulation-based laboratory practices, students' recommendations for the laboratory practices, and the effect of simulation training on their stress levels.
Method: This quantitative-descriptive study was conducted with 54 students who were in the pediatric nursing course. Simulation-based laboratory practices were conducted with five scenarios. Students participated in simulation practices weekly, then given posttests at the end of courses. Data were collected using the descriptive characteristics data form, opinion data form on laboratory practices, and the Clinical Stress Questionnaire (CSQ). All forms except the descriptive characteristics data form and the CSQ were given to the students before and after the practice part of the pediatric nursing course
Results: The knowledge level of students increased from 4.22±0.92 to 4.53±0.84 (W= -2.236, p: 0.025) out of five and feeling of competence level increased from 3.85±0.87 to 4.24±0.79 (W= -2.335, p: 0.020). Most expectations of students about pediatric simulation practices were, "the time of the simulation practices should be longer and numbers of practices should be more". In addition, students stated that laboratory practices with simulation sessions encouraged their critical thinking and enhanced their motor skills. The CSQ mean score was determined to be 33.2 ± 10.5 at the end of the practices means low stress.
Conclusion: According to this study, students' clinical stress level was found low. Knowledge and competency level were increased after the stimulation laboratory practices.

Keywords: Laboratory; nursing; pediatric; practices; simulation

ÖZET
Amaç: Araştırmanın amacı, hemşirelik öğrencilerinin simülasyon temelli laboratuvar uygulamalarının etkinliğine yönelik görüşleri, iyileştirilmesine yönelik önerileri ve simülasyon temelli uygulamaların öğrencilerin stres düzeylerine etkisinin belirlenmesidir.
Yöntem: Tanımlayıcı türdeki bu araştırma pediatri hemşireliği dersi alan 54 öğrenciyle yürütülmüştür. Simülasyon temelli laboratuvar uygulamaları beş senaryo ile uygulanmıştır. Öğrenciler uygulamalara haftalık olarak katılmış ve derslerin tamamlanmasından sonra son testler uygulanmıştır. Veriler tanımlayıcı özellikler veri formu, laboratuvar uygulamalarına ilişkin görüş formu ve Klinik Stres Anketi (KSA) ile toplanmıştır. Tanımlayıcı özellikler veri formu ve KSA dışındaki tüm formlar, öğrencilere çocuk hemşireliği dersinin uygulama kısmından önce ve sonra uygulanmıştır.
Bulgular: Öğrencilerin bilgi düzeyleri (4.22±0.92; 4.53±0.84 W= -2.236, p= 0.025) ve yeterli hissetme düzeyleri (3.85±0.87; 4.24±0.79 W= -2.335, p= 0.020) laboratuvar uygulamaları sonrasında artış göstermiştir. Pediatrik simülasyon uygulamaları ile ilgili öğrencilerin en çok beklentisi "Simülasyon uygulamalarının süresi daha uzun ve uygulama sayısı daha fazla olmalıdır" şeklindedir. Ayrıca öğrenciler simülasyon seanslarının olduğu laboratuvar uygulamalarının eleştirel düşünmelerini teşvik ettiğini ve motor becerilerini geliştirdiğini belirtmişlerdir. Uygulamalar sonunda öğrencilerin KSA ortalama puanı düşük olduğu belirlenmiştir (33.2 ± 10.5).
Sonuç: Bu araştırmaya göre öğrencilerin klinik stres düzeyleri düşük bulunmuştur. Stimülasyon laboratuvarı uygulamalarının ardından bilgi ve yeterlilik düzeyi artırılmıştır.

Anahtar Kelimeler: Laboratuvar; hemşirelik; pediatri; uygulama; simülasyon

Introduction

Nursing education involves an educational system that encompasses cognitive, affective, and psychomotor learning domains in which theoretical knowledge and practical skills are combined (Broussard, Myers & Lemoine, 2009). Nursing education aims to enable student nurses to gain competence to provide safe and holistic care (Bultas, 2011).

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World Health Organization (WHO) recommends that nursing schools should have adequate resources, including clinical skill laboratories, to provide theoretical and practical competence in nursing programs (WHO, 2018). Skill laboratories provide an environment similar to the clinic, thereby preparing students for real clinical practice (Seray-Wurie, Hawker & Chitongo, 2020).

Pediatric nursing is a specialized branch of the nursing profession that requires special attention and skill in the clinic. Providing appropriate care according to developmental stages, communicating and interacting with children, and evaluating children may be difficult because students have limited experience (Broussard et al., 2009; Davies, Nathan & Clarke, 2012). Students are expected to have competence in psychomotor skills as well as develop cognitive and affective skills that allow them to appropriately approach children in clinic and provide safe patient care in several different clinical areas. If the skills for clinical practice are not learned or reinforced correctly, this situation may cause serious health risks for children and increase medical errors caused by nursing interventions (Bowling, 2015).

Studies have shown that clinical skill laboratories using simulation are safe learning environments for students to develop their knowledge and skills (Bultas, 2011; Houghton, Casey, et al., 2012; McCaughey & Traynar, 2010). Simulation-based training in skills laboratories can develop the psychomotor skills of nursing students, increase their self-esteem and self-confidence, and are effective in developing better therapeutic communication with the patient (Houghton et al., 2012; Ter Beest, van Bemmel & Adriaansen, 2018). Such training also facilitates the transfer of acquired skills to clinical practice (McCaughey & Traynar, 2010).

Simulation-based scenarios are tools that improve the students' critical thinking, problem solving, planning, flexibility, and adaptation skills (Romero, Usart & Ott, 2015). Fonseca et al. (2016) found that there was a significant increase in the cognitive learning of students who participate in simulation and computer-based laboratory practices. In addition, students considered this practice as a positive learning experience and stated that their self-confidence increased (Fonseca et al., 2016). Simulation could also become an optimal experiential learning method when quality of clinical teaching opportunities are inadequate. With an emphasis on reality, simulation can facilitate the integration of practicable professional knowledge, skills, qualifications, confidence, communication, and collaboration that students can easily transfer to the clinical environment (Gamble, 2017).

Simulation-based clinical skill laboratories provide an opportunity to students to develop their skills in all domain of learning required to care for newborns and children. It is important to evaluate the nursing students' expectations on simulation-based practices. Studies which is evaluated students' perceptions of simulation based training mostly focus on students' learning experience and some of them investigate the effects on students' confidence, satisfaction etc. (Davies et al., 2012; Fonseca et al., 2016; Baptista et al., 2014; Doğru & Aydın, 2020; Cantrell, Meyer & Mosack, 2017). There are limited studies that were investigating the effects of simulation from the perspective of students' and their recommendations to improve the pediatric nursing simulation practices. Therefore, determining the perceived benefits and limitations of skills laboratories for pediatric nursing students and soliciting their recommendations for their use will increase the quality of education and practice.

Aim of the Study

The aim of the study was to determine the opinions of undergraduate nursing students about the effects of simulation trainings, solicit recommendations for the laboratory interventions and the effect of simulation training on their stress level.

Study Questions

- What are the expectations of the students from the simulation laboratory before and after the course?

- What are the strengths and weaknesses of the simulation laboratory practices according to the students' views?
- What is the students' mean score on the clinical stress questionnaire after the simulation laboratory interventions?
- Are there any differences between self-evaluation checklist mean scores of students before and after the simulation laboratory interventions?

Methods

Design

The quantitative-descriptive study with pre-post survey.

Participants

The study was conducted as descriptive research and was carried out in the spring semester of the 2016-2017 academic year. In this period, the number of students enrolled in pediatric nursing course was 68. The initial sample consisted of 68 students enrolled in the pediatric nursing course at the University during one semester. Inclusion criteria for the study were: (a) students enrolled in the pediatric nursing course, (b) students taking this course for the first time, and (c) students who wanted to participate in the study. Students who missed any part of the simulation laboratory were excluded from the study. Four students who did not complete the entire forms, nine students who did not complete the entire interventions, and one student who took the course before were excluded from the data analysis. All other students wanted to participate in the study. Fifty-four students participated in all simulation interventions and completed the pre- and post-data collection forms during the study process (n = 54, participation rate 79.4%) (Fig 1).

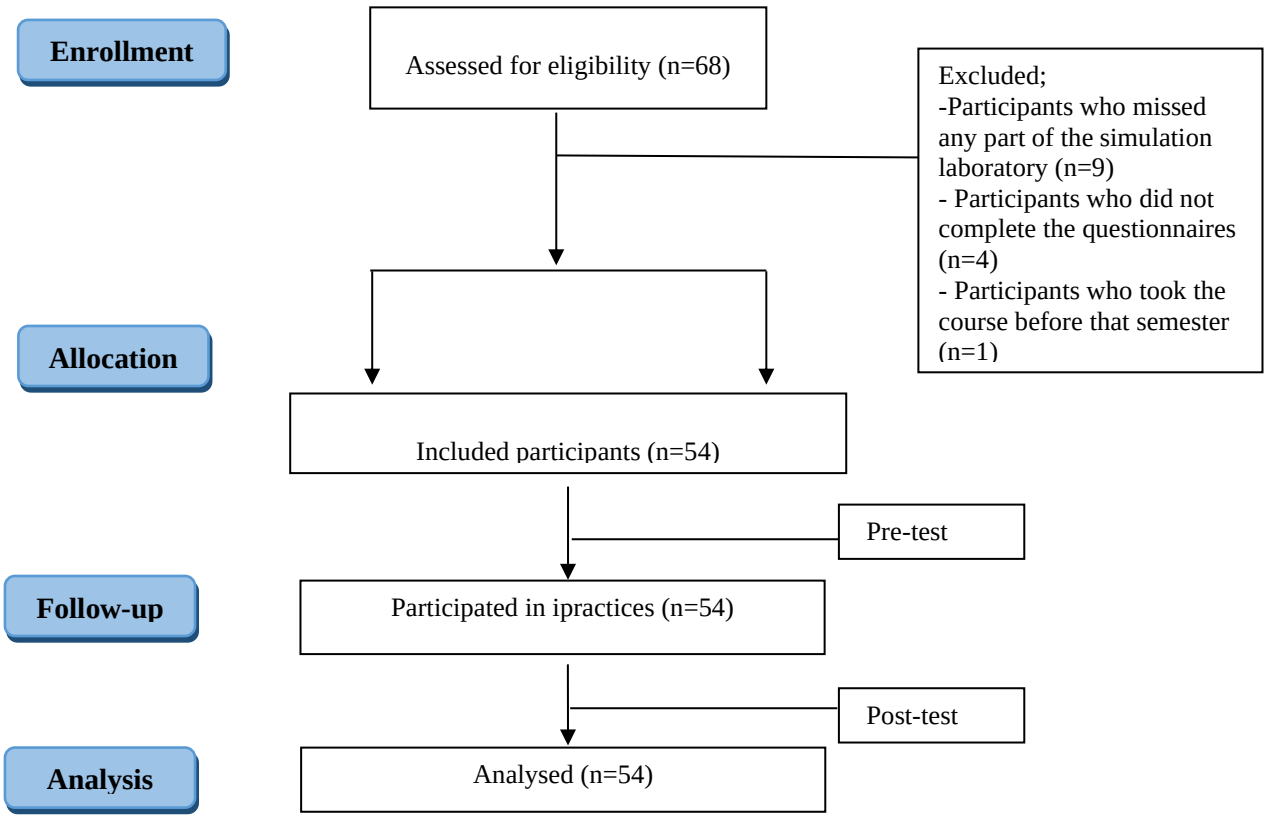

Fig 1. Flow diagram of the inclusion procedure and implementation of the study

Procedures

Simulation laboratory practices

Pediatric nursing education is a combination of theoretical and practical components, which include the cognitive, affective, and psychomotor domains of learning. The pediatric nursing course is 15 credits (ECTS - European Credit Transfer and Accumulation System) (6 hours theoretical and 8 hours practice per week). Simulation laboratory practices comprise 40% of the total practice (clinical and laboratory practice: 112 hours/14 week /one semester). Students went to pediatric clinics of the university hospital after they completed their laboratory practices. Simulation laboratory practices were conducted with five scenarios. Scenarios were constructed by the research team and addressed data collection from children and families (communication and interaction), physical assessment, medication administration, fluid and deficit therapy and CPR. Each practice consisted of the following subjects:

1. Data collection: assessment of patients'/children's medical history, assessment of children's functional health pattern, determination of children's and family's needs and identifying nursing diagnosis. In this scenario, two moderate fidelity mannequins were used to collect data from an infant and a child. Also, live actors were in this scenario to provide an interview with parents.
2. Physical assessment: general systemic physical assessment of children for each age group (0-1, 1-3, 3-6, 6-12, 12-18), evaluation of growth and developmental parameters, identification of problems that exist in children according to the scenarios, and determination of the correct systemic vital signs. Physical assessment was performed on moderate fidelity child and infant simulation mannequins.
3. Medication administration: preparation of children for medication administration procedure, explaining how to administer medications and administration of oral, topical, intravenous, intramuscular (IM), and subcutaneous (SC) medication according to checklists. In these scenario, moderate fidelity child simulation mannequins were used according to scenarios.
4. Fluid and deficit therapy: assessment of fluid input, output, and balance over the previous 24 hours, physical examination and determination of clinical features of dehydration, calculate IV fluid needs for children using body weight and body surface area, and IV fluid initiation and management. The fluid and deficit therapy scenarios were applied on moderate and low fidelity child mannequins.
5. CPR: applying CPR to children aged 0-1, 1-8, and 8 years and over. Scenarios were applied on midlevel fidelity simulation mannequins.

Each scenario was completed in one day in the simulation laboratory and the practices were performed between 8:00 a.m. and 5:00 p.m. Student groups were formed in such a way that every student could be involved in each scenario. Each group had a maximum of five students. All five students entered the simulation room at the same time and each of them was assigned different roles for each scenario. They were expected to perform their role in this time. While the student group was in the simulation room the instructors adjusted the variables according to the scenarios and monitored the students in the control room. At the end of each scenario, the student's skill was evaluated by the instructors using a standardized checklist and feedback was given to each student. The students who wanted to enhance their skills were offered the opportunity to use the simulation laboratory beyond the planned schedule.

Data collection

All forms except the CSQ were applied before the simulation-based practice. As indicated in the literature clinical stress level of students was similar (Cantrell et al., 2017) Therefore we aimed to measure the stress levels of students after their awareness of pediatric nursing practice was established. After completion of the pediatric nursing practice, students completed all forms except the form related to descriptive characteristics. The forms were distributed to the students by the researchers before and after the

intervention (at the end of the all practices), and they were asked to fill in and return them within 1 or 2 days. The completion of the forms took approximately 15 min.

Five forms were used to collect the data as follow;

Descriptive characteristics for students form

In this first form there were four questions about the descriptive characteristics of the students (age, gender, grade average, semester).

Opinion form about simulation interventions

The second form included two open-ended questions to determine the views of the students about the strengths and weaknesses of the simulation laboratory practice.

Expectations form from simulation interventions

The third form consisted of 16 closed-ended questions to determine expectations of students from the simulation laboratory practices. An "other" option was available to collect the students' opinions.

Self-evaluation checklist for students

The fourth form was a checklist of seven defined statements about self-evaluation (knowledge, communication, stress, self-confidence, willingness, competence, decision making) of students. The response of each statement on the checklist was recorded by students on a 5-point scale. Students were asked for each statement to mark one option out of five (1 = "I do not agree", 2 = "I agree a little", 3 = "I am undecided", 4 = "I agree", 5 = "I completely agree". Forms which are related to simulation laboratory practices were developed by researchers according to the nursing literature on the subjects of simulation based training guidelines and text-books, simulation laboratory forms and previously developed scales (Mahoney, Hancock, Iorianni-Cimbak, & Curley, 2013; Roh, Lee, Chung & Park, 2013; Tosterud, Hedelin, & Hall-Lord, 2013; Haraldseid, Friberg, & Aase, 2015). After an item pool was created, forms were sent to five experts (specialized in pediatric nursing and simulation based training) for content validity. The Davis technique was used to evaluate the experts' opinions on the relevance of the terms. The experts were asked to examine every item in the scale and to rank each on a 4-point scale: "very appropriate" (4 points), "item needs to be put into an appropriate form" (3 points), "appropriate but needs minor changes" (2 points) or "not appropriate" (1 point). The content validity index was calculated by dividing the total score of each item by the total number of experts in a given technique. The experts did not advise excluding any item. All items were between 0.84 and 0.94.

The Clinical Stress Questionnaire (CSQ)

The CSQ is a 5-likert instrument that assess the students' stress value at the begining of clinical experience (Pagana, 1989). Scale consists of 20 items and four sub-dimensions as follow: threat, challenge, harm, and benefit. The scores that can be obtained from the scale vary between 0 and 80. The higher the score, the greater the stress level. The internal consistency for the challenge, threat, harm, and benefit scales was $\alpha = .85$, $\alpha = .84$, $\alpha = .71$ and $\alpha = .70$ respectively (Pagana, 1989). The Turkish validity and reliability of the CSQ was established by Sendir and Acaroglu, 2008 (Cronbach's $\alpha = .70$) (Sendir & Acaroglu, 2008). All data collection forms and their features used in the study are given in Table 1.

Table 1. Data collection tools and features used in the study

Instrument	Definition	The Time of Data Collection
1. Descriptive Characteristics for Students Form	This form was used to in order to determine the sociodemographic characteristics of the students. A total of 4 questions regarding the sociodemographic characteristics (age, gender, grade average, semester) of the students were included in the form	At the beginning of the study
2. Opinion Form about Simulation Interventions	The form was used to determine the views of the students about the strengths and weaknesses of the simulation laboratory practice. The form consisted of two open-ended questions.	At the beginning and at the end of the study
3. Expectations Form from Simulation Interventions	The form consisted of 16 closed-ended questions to determine expectations of students from the simulation laboratory practices	At the beginning and at the end of the study
4. Self-evaluation Checklist for Students	The form consisted of seven statements about self-evaluation (knowledge, communication, stress, self-confidence, willingness, competence, decision making) of students.	At the beginning and at the end of the study
5. Clinical Stress Questionnaire (CSQ).	The form was used to determine the initial stress value of nursing students in their first pediatric simulation practice experience. The form which is a Likert-type instrument inclued 20 items. These items are divided into four categories: threat, challenge, harm, and benefit.	At the end of the study

Ethical considerations

Institutional and ethical approvals were obtained from the University Ethical Commission (No: 2017-145) and confidentiality of the students' data were maintained throughout the study. Written consent of the students was obtained for the study.

Statistical analysis

Frequency and percentage distributions related to the data were obtained. The Kolmogorov-Simirnov test was used to analyze the distribution of data. Non-normally distributed data were analyzed by Wilcoxon Z test. The significance level was accepted as $p < .05$ for the statistical tests. The answers of open-ended questions were classified according to related literature (Broussard et al., 2009; Bultas, 2011; Tosterud et al., 2013; Haraldseid et al., 2015; Cato, Lasater, & Peeples, 2009). The first and second authors performed the topics of the scenarios independently. They then compared and checked the topics. No corrections were needed following this comparison and the scenarios were finalized.

Results

The mean age of the students was 21.01 ± 1.47 and most of them were female (92.6%). The students' descriptive characteristics are shown in Table 2. Students' expectations were specified in six main topics including teaching staff, physical environment, tools/materials, content of practice, time, and preparation pre-simulation laboratory practices. Expectations of students from the simulation laboratory practices and fulfillment of expectations are given in Table 3. The first four expectations of students before the practices were the size and comfort of the simulation laboratory (74.0%), provision of a long practice period (66.6%), an understandable approach of teaching staff (59.2%), and lighting, heat, ventilation, and cleanliness of the simulation laboratory (59.2%). Students indicated that their expectations were met for most items.

Table 2. Students' descriptive characteristics (N=54)

Descriptive Characteristics	M±SD	Min-Max
Age (year)	21.01±1.47	20-30
Grade* (out of 4)	2.97±0.35	2-3.6
	n	**%**
Gender		
Female	50	92.6
Male	4	7.4
Semester		
5th semester	4	7.4
6th semester	49	90.7
8th semester	1	1.9

*According the students' expressions; M=Mean; SD=Standard Deviation

Expectations that were partially met after the practices included: communication and interaction with teaching staff (40.7%); lighting, heat, ventilation, and cleanliness of the laboratory environment (51.8%); quantity of tools in the laboratory (24.0%); the long practice period (22.2%), and a quiet environment with few people (16.6%). Only compliance with the specified time expectation of students increased post-simulation laboratory practices (14.8% vs. 24.0%).

Table 3. Expectations of students before and after simulation lab practices and fulfillment of expectations (N=54)

Items*	Expectation (Before) *n* (%)	Fullfillment (After) *n* (%)
Teaching staff		
Understanding	32 (59.2)	32 (59.2)
Communication and interaction	26 (48.1)	22 (40.7)
Knowledable	23 (42.5)	23 (42.5)
Supportive	13 (24.0)	13 (24.0)
Physical environment		
Size, comfort	40 (74.0)	40 (74.0)
Lighting, heat, ventilation, cleaning	32 (59.2)	28 (51.8)
Quiet, few people	17 (31.4)	9 (16.6)
Tools-materials		
Quality	31 (57.4)	31 (57.4)
Quantity	17 (31.4)	13 (24.0)
Easily accesible	4 (7.4)	4 (7.4)
Content of practice		
Informative	23 (42.5)	23 (42.5)
Easy, understandable, attractive	15 (27.7)	15 (27.7)
Compatible with theorical information	12 (22.2)	12 (22.2)
Including a systematic approach	5 (9.2)	5 (9.2)
Time		
Long practice period	36 (66.6)	12 (22.2)
Compliance with specified time	8 (14.8)	13 (24.0)
Preparation period before practice	1 (1.8)	1 (1.8)
Preparation before simulation lab		
Giving information	24 (44.4)	24 (44.4)
Having clinical guidance	10 (18.5)	10 (18.5)
Preparation of teaching staff and materials	5 (9.2)	5 (9.2)
Preview	4 (7.4)	4 (7.4)

*Percentages are given according to $n = 54$ for each item.

Opinions of students about the strengths and weaknesses of the simulation laboratory practices are shown in Table 4. Students indicated the strengths to include: increased practical and communication skills, knowledge, self-awareness and confidence; reinforcement of knowledge and skills; compliance with and

preparation for clinics; and working individually. Student opinions about self-awareness/self-confidence increased after the practices (16.6% vs. 31.4%), as did working individually (0.0% vs. 12.9%). Students' opinions about the weaknesses of the simulation laboratory practices focused on stress, excitement, fear, unwillingness to participate, boredom, and time management. Opinions about stress and excitement decreased (9.2% vs. 3.7%) after the laboratory practices. Students' views about time management (5.5%) as a weakness emerged after the practices.

Table 4. Opinions of students about strengths and weaknesses about simulation lab practices

Opinions of Students	**Before** ***n* (%)**	**After** ***n* (%)**
Strengths**		
Increasing practical skills	32 (59.2)	31 (57.4)
Increasing knowledge	19 (35.1)	21 (38.8)
Reinforcement of knowledge and skill	16 (29.6)	18 (33.3)
Increasing communication skills	15 (27.7)	14 (25.9)
Compliance and preparation to the clinics	11 (20.3)	13 (24.0)
Increasing self-awareness and self-confidence	9 (16.6)	17 (31.4)
Working individually	-	7 (12.9)
Weaknesses**		
Distress, excitement	5 (9.2)	2 (3.7)
To be afraid	3 (5.5)	-
Unwillingness	3 (5.5)	-
To be bored	2 (3.7)	-
Time management	-	3 (5.5)

*Percentages are given according to n = 54 for each item; **Percentages show the number of students indicating this statement

The students' self-evaluation checklist and CSQ mean scores are shown in Table 5. Self-evaluation scores of students including knowledge, communication, stress, self-confidence, willingness, competence, and decision-making levels increased post-simulation laboratory practices. However, differences between beginning and ending mean scores were only found to be statistically significant for knowledge and competence levels (p=0.02). The CSQ mean score was determined to be 33.2±10.5 out of 80 at the end of the practices which means low stress.

Table 5. Students' self-evaluation checklist and clinical stress questionnaire mean scores

Items	**Before**		**After**		**Test**	
	M±SD	**Min-Max**	**M±SD**	**Min-Max**	**W**	**p**
Knowledge Level	4.22±0.92	1-5	4.53±0.84	1-5	-2.236	0.02*
Communication Skill	4.22±1.07	1-5	4.38±0.87	1-5	-0.800	0.42
Distress Level	2.98±1.57	1-5	3.00±1.08	1-5	-0.106	0.91
Self-confidence Level	4.12±0.97	1-5	4.29±0.86	1-5	-0.913	0.36
Willingness Level	3.72±0.91	1-5	4.01±0.81	2-5	-1.862	0.06
Competence Level	3.85±0.87	1-5	4.24±0.79	1-5	-2.335	0.02*
Decision Making Skill	4.00±0.89	1-5	4.24±0.75	1-5	-1.489	0.13
CSQ**	-	-	33.2±10.5	9-61	-	-

*p < 0.05; ** The CSQ was assessed only after the students had attended the pediatric clinics and was evaluated at the end of the semester; CSQ=Clinical Stress Questionnaire

Discussion

As indicated in previous researches, students were satisfied with the simulation learning experience (Roh et al., 2013; Ostovar et al., 2018). In their study Oh, Jeon, & Koh (2015) suggest that simulation-based learning could positively affect the students' motivation which is contribute knowledge and clinical skill acquisition (Oh et al., 2015). In order to improve this satisfaction and provide effective learning, the conditions of simulation practices must be improved, and the expectations of students must be met. When students' expectations about the application have been examined, they report that physical (facilities, materials, standard procedures etc.), psychosocial (expectations), and organizational (faculty resources)

factors affect their learning (Haraldseid et al., 2015). They expect to able to access the facilitated equipment (Haraldseid et al., 2015), have adequate time (Roh et al., 2013), and receive constructive feedback and positive reinforcement from the instructor (Roh et al., 2013; Rowbotham & Owen, 2015). In this study, results showed that students mostly expected a comfortable physical environment, indulgent/understanding and supportive instructors, qualified equipment, and informative education material. Most of these expectations were met after the simulation practices.

Evidence suggests that well-designed and implemented simulation improves students' knowledge and skills (Fey & Kardong-Edgren, 2017; Torkshavand, Khatiban & Soltanian, 2020). Saied (2017) stated that knowledge scores of pediatric nursing students were significantly higher after participating in a simulated experience (Saied, 2017). One of the significant findings of this study is a statistically significant increase in students' knowledge according to self-evaluation after the simulation practices. Students stated that simulation practices reinforced their knowledge and psychomotor skills, which is a strength of simulation training. In addition to theoretical education, repeated practical education, in which they take in a realistic simulation environment, undoubtedly increases students' knowledge level and skills.

In our study, stress/excitement was specified by students as a weakness of the simulation practices. After simulation, there was a decrease in the number of students who expressed stress as a weakness and there was no significant difference in students' stress levels between the pre- and post-self-evaluation checklist. In addition, the CSQ mean score was low (32.9 ± 10.6) at the end of the practices. Altay & Toruner (2013) showed that students' CSQ scores after a pediatric clinical experiences practice was higher without simulation (42.6 ± 9.8) (Altay & Törüner, 2014). Megel et al. (2012) supported that simulation could reduce the pediatric nursing student's anxiety (Megel et al., 2012). Likewise, Khaila (2014) explored the effectiveness of simulations in reducing anxiety and results revealed that anxiety scores decreased after participating in simulation (Khalaila, 2014). On the other hand, some studies showed that students reported stress associated with simulation (Cantrell et al., 2017; Cato et al., 2009; McGuire & Lorenz, 2018; Sarı et al., 2018). However, in this study few students (before n = 5 and after n = 2) expressed the simulation practices stressful, most of the students' stress level decreased after the simulation practices. The simulation experience with realistic scenarios and situations can lead to students to think about how they will intervene in real situations in the clinic and may cause them to feel stressed about it.

Students who experienced simulation practice felt that they are developing competencies. Thus, they will be more self-confident and improve their skills in clinical practice (Baptista et al., 2014; Martins et al., 2016). Similarly, in this study student's competence level scores showed statistically significant increases after simulation practice. As an active learning environment, simulation practice allows students to think critically and act without worry and without perceiving any risk. It could be effective in building students' sense of competence.

Previous research demonstrates that simulation-based training for pediatric nurses also improves students' communication skills (Oh et al., 2015; Yeh et al., 2019), self-confidence (Martins et al., 2016; Pereira-Salgado, Philpot, Schlieff, O'Driscoll, & Mills, 2019), critical thinking, and decision-making skills (Andrew & Baxter, 2019; Hustad et al., 2019). However, in this study there was no statistically significant differences in these parameters. To enhance these skills and support their self-confidence, repetitive practice and sensitive evaluation could be beneficial.

Strengths and limitations

This study contributes to the current literature on students' views about a pediatric simulation/simulation-based clinical skill laboratories in undergraduate pediatric nursing education. This is one of the few studies addressing many aspects of the subject in Turkey. However, a few limitations should be noted. First, the

study was conducted with a small sample from a single school of nursing, and it may be difficult to generalize the results beyond this population. Second, there is no standardization in simulation scenarios and use of simulations, content, and objectives may be different in each school. Also, experts' recommendations did not received for the scenarios before the implementation. Third, students were asked to fill the questionnaire within 1 or 2 days. This may cause students to be affected by each other. Fourth, the clinical stress level of the students was measured only after the laboratory practices. Not knowing the stress levels before the application constitutes the limitation of the findings. Another limitation is the use of student self-evaluation, so results may vary depending on perceptions, beliefs and vulnerability to being students.

Conclusion

The findings of this study demonstrate that students' expectations were fulfilled regarding effective communication and interaction with instructors, comfort of the physical environment, informative content about practices, quality of the equipment, and receiving information in order to prepare for the simulation session. Students reported that simulation practices improved their knowledge and skills, gave them a chance to working individually and increased their self-awareness and self-confidence. Laboratory practices using simulation seem to be effective in pediatric nursing education and support students in achieving more efficient nursing practices before clinical practice. Future studies should examine the impact of different types of simulation experiences over time with a control group and the effects on real clinical situations in terms of safe and effective care.

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