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THE EFFECT OF PEER MENTORING MODEL USED TO TEACH PERIPHERAL INTRAVENOUS CATHETER PLACEMENT ON KNOWLEDGE, SKILLS, SELF-CONFIDENCE, SATISFACTION AND FEAR OF NURSING STUDENTS: A RANDOMIZED CONTROLLED TRIAL

AKRAN MENTÖRLÜĞÜ MODELİNİN HEMŞİRELİK ÖĞRENCİLERİNİN PERİFERİK İNTRAVENÖZ KATETER UYGULAMASINDA BİLGİ, BECERİ, ÖZGÜVEN, MEMNUNİYET VE KORKU ÜZERİNE ETKİSİ: RANDOMİZE KONTROLLÜ ÇALIŞMA

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ABSTRACT

Objective: The aim of this study is to evaluate the effect of peer mentoring model used to teach peripheral intravenous catheter placement on knowledge, skills, self-confidence, satisfaction and symptoms of fear of nursing students.

Method: This is a controlled, randomized, parallel group and single center study. The Shapiro-Wilk Test, Wilcoxon Signed Rank Test, Mann-Whitney U Test were used for the analysis of the data. The EtaSquared value was used for the effect value of the data.

Results: When peripheral intravenous catheter knowledge and skills of students were evaluated, there was no statistical difference between the knowledge and skill mean scores of the students in the peer mentoring model group (n=50) and the students in the traditional teaching model (n=51) (p=0.389). When the scores for satisfaction about peripheral intravenous catheter insertion procedures were analysed, a significant difference was found between the groups with an effect value below the medium level (p=0.048, η2=0.038). When the students' self-confidence scores were evaluated, a significant difference was found the groups with an effect value the medium level (p=0.004, η2=0.078). The students in the control group experienced more often symptom of feeling tense compared to the students in the experimental group (p=0.004).

Conclusion: This study found that the peer mentoring model was as effective as the traditional teaching model in gaining skills of peripheral intravenous catheter placement, and the students' self-confidence and satisfaction were higher.

Key Words: Mentoring, Nursing Students, Intravenous Catheter, Knowledge, Skills

ÖZ

Amaç: Bu çalışma, periferik intravenöz kateter uygulamasının öğretiminde akran mentörlüğü modelinin hemşirelik öğrencilerinin bilgi, beceri, özgüven, memnuniyet ve korku semptomlarına etkisini değerlendirmek amacıyla yapıldı.

Yöntem: Randomize kontrollü, paralel gruplu ve tek merkezli bir çalışmadır. Verilerin analizinde Shapiro-Wilk Testi, Wilcoxon Signed Rank Testi, Mann-Whitney U Testi kullanıldı. Verilerin etki değeri için Eta kare değeri kullanıldı.

Bulgular: Öğrencilerin periferik intravenöz kateter uygulamasında bilgi ve becerileri değerlendirildiğinde, akran mentörlüğü modeli grubundaki öğrenciler (n=50) ile standart öğretim modelindeki öğrencilerin (n=51) bilgi ve beceri puan ortalamaları arasında istatistiksel olarak fark bulunmadı (p=0.389). Periferik intravenöz kateter uygulamasında öğrencilerin memnuniyet puanları değerlendiğinde gruplar arasında orta düzeyin altında etki değeri olan anlamlı bir farklılık bulundu (p=0.048, η2=0.038). Öğrencilerin özgüven puanları değerlendiğinde gruplar arasında orta düzey etki değeri olan anlamlı bir farklılık bulundu (p=0.004, η2=0.078). Kontrol grubu ve deney grubu karşılaştırıldığında Kontrol grubundaki öğrencilerin, deney grubundaki öğrencilere göre kendilerini daha fazla gergin hissettiği belirlendi (p=0.004).

Sonuç: Bu çalışmada periferik intravenöz kateter uygulamasında öğrencilere beceri kazandırılmasında akran mentörlüğü modelinin standart öğretim modeli kadar etkili olduğu, öğrencilerin özgüven ve memnuniyetlerinin daha yüksek olduğu bulundu.

Anahtar Kelimeler: Mentörlük, Hemşirelik Öğrencisi, İntravenöz Kateter, Bilgi, Beceri

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INTRODUCTION

Nursing education which consists of theoretical and practical education aims to teach cognitive, affective, and psychomotor behaviors to students [1,2]. Teaching of psychomotor skills which constitutes the most important aspect of nursing education is done in Nursing Skills Laboratories (NSL) [3]. NSLs with an environment similar to hospitals allow students to fill the gap between clinical and theoretical education, to experience self-learning, and decrease pre-clinical anxiety and prepare students for the clinical environment [4].

One of the practices that cause anxiety in nursing students in a clinical environment is peripheral intravenous catheterization (PIVC) insertion. PIVC insertion is a practice where students experience the highest level of anxiety and problems while trying to correctly implement the steps of the process [5]. While PIVC is being inserted, students experience high levels of fear, shaking hands and even discontinued the process. The thought of avoiding harm to the patient, lack of professional knowledge and skills, tension in student-instructor relations are contributing factors to the fear [6]. Among the studies that evaluated clinical practice satisfaction of students, some of them show that students are satisfied while others show that students are not satisfied [7]. Therefore, in nursing education, in addition to traditional methods, it is necessary to integrate supportive models into education in the development of laboratory and clinical skills of students [8,9]. Peer mentoring is one of the models used in laboratory and clinical skills training [10,11].

Mentoring, which is thought to have a key role in professional nursing education, is defined as a process where an experienced practitioner (mentor) is a role model to a less experienced practitioner (mentee), and provides him or her consultancy and guidance [12,13]. Meanwhile, in peer mentoring, senior students with similar conditions support the learning process of students in their first years [3,14]. The most important roles of mentors are to help, support, guide, and encourage student nurses to learn new skills, to adapt to new behaviors, to gain new attitudes, to combine theory with practice [9,11,14,15]. Studies report that peer mentoring in laboratory or clinical settings positively affects cognitive, psychomotor, and affective development of the mentee student [8,9], reduces students' fear, stress, and anxiety during the practice of these skills [3,16,17], and provides self-confidence, critical thinking, communication skills and gives opportunities to develop leadership skills [18-21].

The number of instructors in higher education institutes for nursing in Turkey is believed to be insufficient for the number of nursing students and there is only 1 instructor approximately for 60 students [22]. In addition, in the study conducted by the Nursing Education Association and the Council of Higher Education to investigate problems in nursing education, insufficient number of instructors (40.9%) was stated as the second most common problem. Due the insufficient number of instructors, students are believed to struggle to put their skills they learned in NSL conditions into practice [23]. The peer mentoring model is one of the solutions since it decreases the need for instructors [24]. There are only a limited number of studies in the world and in Turkey, in which peer mentoring model was directly used in teaching psychomotor skills and compared with existing teaching methods. Therefore, this study's aim was to investigate the effect of peer mentoring model on the peripheral intravenous catheter insertion skills, knowledge, self-confidence, satisfaction and fear of students receiving training with this method.

Hypotheses of the Study:

Hypothesis 1: The knowledge score of the students in the peer mentoring model group is higher than those in the control group.

Hypothesis 2: The skill score of the students in the peer mentoring model group is higher than those in the control group.

Hypothesis 3: The self-confidence score of the students in the peer mentoring model group is higher than those in the control group.

Hypothesis 4: The satisfaction score of the students in the peer mentoring model group is higher than those in the control group at the end of the training.

Hypothesis 5: The fear symptoms score of the students in the peer mentoring model group is lower than those in the control group.

METHOD

Research Type

This is a controlled, randomized, parallel group (experiment and control), single center study. Students in the experiment group received training using the peer mentoring model whereas for the students in the control group traditional teaching model was used. No change on the method was made after the study commenced.

Participants

The study was conducted between May 02-31, 2018. and the study population consisted of first-year (N=113) students in the department of nursing of a state university in Turkey. No sample was selected since the goal was to have access to the entire population and all students who met the inclusion criteria were included in the sample.

Inclusion criteria

To register for the Principles of Nursing course for the first time; not having experience in intravenous catheter placement and volunteering to participate in the study.

Exclusion criteria

Those who have taken nursing principles course before, those who had experience about intravenous catheter insertion and those who were not present on the pre and post-evaluation days were excluded from the study (Figure 1).

Randomization and Blinding

Students were assigned numbers from 1 to 107 according to their class lists. An Assistant Researcher who did not have any information about the study used the Research Randomizer software program (https://www.randomizer.org/) to randomize students with the simple random sample method and 53 students were assigned to the first group and 54 students were assigned to the second group. Single blind method was used in the study. Only participant blinding was used in the study. In order to provide this, a general explanation of the figure will be made to evaluate the IV peripheral catheter application while informing the students about the study, and the students performed the skill in different laboratory rooms at the same time. In addition, they were asked not to talk among themselves about the laboratory practice so that there would be no interaction between the experimental and control groups. In the post-test, researcher blinding could not be done, as the only assistant researcher observed the PIVC placement practice. Six students who were not present in the school on the post-test day were excluded from the study and the study completed with 101 students; 50 in the experiment group and 51 in the control group.

The population of the study consisted of students (N=103) studying in their last year in the paramedical department of a university. In the study, it was aimed to reach the entire population without choosing a sample. The study was completed with a total of 81 (participation rate: 78.6%) students who voluntarily participated in the study.

Measurements

Student Information Form: It consisted of five questions including students' age, gender, questions about whether they see themselves fit to practice nursing, whether they have chosen nursing profession willingly, and the academic GPA.

PIVC Knowledge Evaluation Form: This form was prepared by the researchers to determine the level of PIVC insertion knowledge of students, in accordance with the relevant literature [25,26]. There are

12 questions in the form to evaluate students' knowledge about IV catheter insertion. In this form, correct answers were given 1 point, while incorrect answers or no answer were given 0 points. Students are expected to have a minimum score of 0 and a maximum of 12 points. There is no cut-off point for scoring and with the increasing scores, students' knowledge also increases. To ensure content validity of this form, opinions of five experts in the field of nursing were obtained and the content validity index was found to be 0.96. The reliability of the form was calculated with the formula of Kuder Richardson-20 (KR-20) and the KR-20 value was determined as 0.74.

PIVC Skill Checklist: The form prepared by the researchers based on the literature [25,26] consists of 33 steps. After applying each step, each student receives 2 points if the insertion is satisfactory, 1 point if it is to be developed, and 0 point if it is unsatisfactory. Students are expected to get a minimum of 0 points and a maximum of 66 points from the PIVC Skill Checklist. There is no cut-off point for scoring and with the increasing scores, students' skill levels also increase. To ensure the scope validity of the PIVC Skill Checklist, five experts in the field of nursing were consulted and the validity index was determined as 0.97. Cronbach alpha reliability coefficient is 0.77.

Visual Analog Scale: Visual Analog Scale was used to determine the level of self-confidence about PIVC and satisfaction level for the method. The students were asked to score their self-confidence about PIVC on the scale. "0" in the scale indicated they lack confidence, and increasing score meant a rising confidence level, and a "10" point showed a full confidence level. In the same way, students were asked to score their satisfaction level about the method used in PIVC teaching. Again, a "0" score meant no satisfaction about the method, increasing scores indicated increasing satisfaction, and a "10" meant full satisfaction.

Symptoms of Fear Scale: The scale was developed by Page et al. in 1997 and it was adapted into Turkish by Khorshid et al. in 2002 [6]. The scale consists of 17 items that aim to determine the symptoms of fear that students feel during the invasive intervention. The rating of the scale in the form is "Yes-No" for each symptom. The percentage distributions of the student for each symptom are given in the scale. There is no cut-off point as there is no total score. The Kuder Richardson reliability coefficient, which was 0.68 in the Turkish adaptation study [6], was found to be 0.90 in this study.

Interventions

Selection and Training of Students Who Are Peer Mentors: Firstly, six students from third year were selected as peer mentors. Students who got good grades from the fundamental of nursing course, had a GPA of 3.00 and above, had good communication skills and volunteered to mentor were determined as mentors. Fourth-year nursing students were not preferred as mentors because they were in hospital internship program within the scope of the internship application course during the conduct of the research (Figure 1). After each of these students signed an informed consent form, they were given 60 minutes of theoretical training on mentorship by the researcher and how to work as a mentor in the laboratory as well as for PIVC insertion. Immediately after the theoretical training, mentor students inserted PIVC at least once on the plastic arm model under the supervision of the researcher in the nursing skills laboratory (Figure 1).

The training was provided in a classroom setting. Before PIVC insertion, all students participating in the study were given 50-minute theoretical training on insertion. The content of the training was developed based on the literature review by the researchers [25,26]. The training included information about the PIVC, its definition, the reasons for PIVC complications, veins used for PIVC, the factors affecting PIVC, PIVC steps, complications related with intravenous treatment and peripheral intravenous catheter care [25,26]. At the end of the training, a summary of the information provided was given and a question-answer session was used to evaluate how much students had learned. The training for mentor and mentee students was given by the same researcher to avoid any difference in training caused by using different teachers (Figure 1).

Five days after the theoretical training, PIVC Knowledge Evaluation Form and Student Information Form were filled in as a pre-test to evaluate the information of the students before PIVC insertion practice in the professional skills laboratory.

Application of the study

The students in the experimental group tried to gain PIVC insertion skills by using peer mentoring model. According to the PIVC insertion instructions, all the students in the experimental group were shown the practice once on the plastic IV injection arm model. Later, each mentee student inserted PIVC together with a mentor at least once and students' questions were answered after students repeated the practice. After PIVC insertion under the supervision of the mentor, students were allowed to practice on their own without any limitation on the time. When the students reported that they were ready and felt comfortable and safe, the study of the experimental group was terminated.

Traditional teaching method was used in the control group. Here, the students made a laboratory application with the lecturers in the course. Each group was shown how to insert PIVC according to the PIVC instructions by the researcher on the plastic IV injection arm model and then each student was given the opportunity to practice it with the researcher at least once during the class. After the students repeated the procedure, the students' questions were answered. The students were allowed to practice their skills after they performed under the supervision of the researcher and there was no time limit for this practice. The control group's study was terminated when the students reported that they were ready and felt comfortable and safe.

After the procedure was completed, in both groups, the symptoms of fear of the students were evaluated using the Symptoms of Fear Scale and their self-confidence about PIVC insertion procedure and their satisfaction level with the method used were determined with the Visual Analog Scale (Figure 1).

Fifteen days after the completion of the PIVC insertion training, before clinical applications, final evaluations of the students were made. At the same time, students were asked to fill the PIVC Knowledge Evaluation Form and immediately after that, their PIVC skills were evaluated. Each student inserted an IV catheter into a plastic IV injection arm model. The skills of the students were evaluated by an independent observer specialized in the Principles of Nursing, who is not a researcher in the study, using the PIVC Skill Checklist. The study was completed with 101 students. Three students from the control group and three students from the experiment group who were not present in the school on the day of the post-test were excluded from the sample at the end of the study (Figure 1). Six students who were not included in the sample at the beginning of the study were given theoretical training and practical training in the skills laboratory by the researcher after the study was completed.

Outcome Measure

Primary Outcome Measure: The primary purpose of this study is to evaluate the effect of the peer mentoring model used in the teaching of peripheral intravenous catheterization on the knowledge and skill level of nursing students. Students were asked to fill out Student Information Forms before the training to learn about their sociodemographics data and PIVC Knowledge Evaluation Form to understand their level of knowledge before and 15 days after the training in the laboratory and PIVC Skill Checklist was used to evaluate their skill levels 15 days after the training in the laboratory.

Secondary Outcome Measure: The secondary aim of this study is to evaluate the effect of the peer mentoring model used in the teaching of peripheral intravenous catheterization on the symptoms of self-confidence, satisfaction and fear in nursing students. The Visual

Analog Scale was used to evaluate self-confidence and satisfaction and the Visual Analog Scale was used right after the training in the laboratory to evaluate fear symptoms.

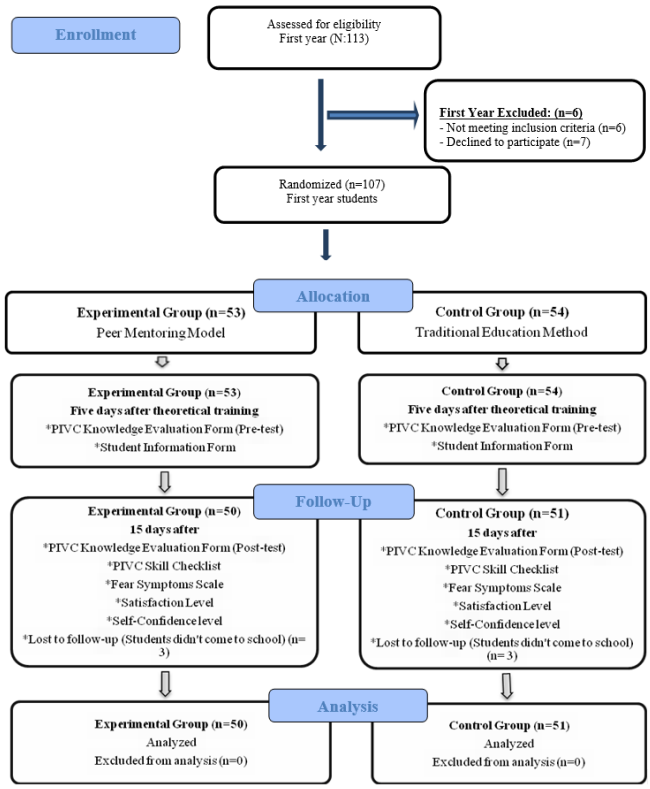

Figure 1. CONSORT flowdiagram

Statistical Analysis

Statistical Package for the Social Sciences (SPSS) 22 package program was used to evaluate the data and the statistical significance level was determined to be $p<0.05$. Shapiro-Wilk Test was used to determine whether the data of the research have a normal distribution or not and it was determined that the data did not have normal distribution. The data related to the sociodemographic characteristics of the individuals included in the study was evaluated by number, percentage test. The Wilcoxon Signed Rank Test was used to determine the difference between the scores obtained before and after the training in the experimental and control groups, and the Mann-Whitney U test was used to compare the scores between the groups before and after the training. In addition, the Kuder Richardson reliability coefficient was used. The Eta Squared value was used for the effect value. In the reporting of effect value was accepted 0.01 small, 0.06 medium, and 0.14 large [27]. Statistical significance level of 0.05 was used in the study.

Ethical Approval

Ethical approval was obtained from the Scientific Research and Publication Ethics Board of Necmettin Erbakan University (Date: 27.04.2018, issue number: 2018/1310) and the permission was obtained from the department where the study was conducted. In addition, the students were informed about the purpose of the study and written informed consents were obtained.

RESULTS

Background information about all participants (50 from the experimental group and 51 from the control group) is presented in Table 1. The results show that there is no statistically difference for sociodemographic characteristics between the experimental and control groups (p=0.444, p=0.774, p=0.429, p=0.436) (Table 1).

Table 1. Demographic characteristics of the students in the experimental and control groups (n=101)

Demographic characteristics	Experimental Group (n=50)		Control Group (n=51)		X^2	p value
	n	%	n	%		
Gender						
Female	37	74	41	80.4	0.587	0.444
Male	13	26	10	19.8		
Appropriate for nursing profession						
Yes	33	66	28	54.9		
No	3	6	6	11.8	1.690	0.429
Partly	14	28	17	33.3		
Preferred the nursing profession						
Yes	24	18	26	51		
No	9	18	13	25.5	1.660	0.436
Partly	17	34	12	23.5		
Total	**50**	**100**	**51**	**100**		
Mean Age	19.12±1.04		19.21±1.18		3.274	0.774

X^2: chi-square test

The students' mean pre-test and post-test scores for PIVC knowledge are shown in Table 2. There was no statistically significant difference between the post-test mean scores of the students in the experimental and control groups (p=0.389), (Table 2). There was no statistically significant difference between the pre-test and post-test mean scores of the knowledge mean scores of the experimental group (p=0.104). In the control group, there was a significant difference between the pre-test and post-test mean scores and this difference was medium level (p=0.006, η2=0.070). When the experimental and control groups were compared, it was found that there was a significant difference between the pre-test mean scores and this difference was the medium level (p=0.008, η2=0.065), there was no difference between the post-test mean scores (p=0.389) (Table 2).

Table 2. Comparison of PIVC knowledge mean scores of the students in the experimental and control groups (n=101)

PIVC Knowledge Mean Scores	Experimental Group (n=50)	Control Group (n=51)
Pre-test	9.04±1.57 (Min=4-Max=12)	8.33±1.73 (Min=5-Max=12)
Post-test	9.44±1.24 (Min=6-Max=12)	9.03±1.73 (Min=5-Max=12)
Test value*	-1.624	-2.748
p	0.104	0.006
η2	0.070	
Comparison of PIVC Knowledge Mean Scores		
Pre-test**	-2.639	
p	0.008	
η2	0.065	
Post-test**	-0.862	
p	0.389	

**Wilcoxon Signed Ranks Test, ** Mann-Whitney U test, η2: EtaSquared value*

The students' mean scores for PIVC Skill Checklist, self-confidence and satisfaction are shown in Table 3. When mean scores for PIVC skills of the students were evaluated, there was no statistically significant difference between the mean scores of the students in the experimental and control groups (p=0.649) (Table 3). There was a significant difference with an effect value below the medium level self-confidence score of the students in the experimental group and control group (p=0.048**,** η2=0.038) (Table 3). There was a significant difference with the medium level effect value was found between satisfaction score of the students in the experimental group and control group (p=0.004, η2=0.078) (Table 3).

Table 3. Comparison of PIVC skills checklist, self-confidence, and satisfaction mean scores of the students in the experimental and control groups (n=101)

Variable	Experimental Group (n=50)	Control Group (n=51)	**Test value	p	η^2
PIVC Skill Checklist mean scores	28.74±9.95 Min=0-Max=51	30.37±10.67 Min=2-Max=53	-0.456	0.649	-
Self-Confidence mean score	8.18±1.99	7.47±1.91	-1.981	**0.048**	**0.038**
Satisfaction mean scores	8.72±1.70	7.23±2.68	-2.904	**0.004**	**0.078**

*** Mann-Whitney U test, η2: EtaSquared value*

When students' symptoms of fear during PIVC insertion were evaluated, there was only a statistically significant difference for feeling tense symptom between the two groups (p=0.004). The students in the control group experienced more often symptoms of feeling tense compared to the students in the experimental group (Table 4).

Harms

The study does not pose a significant risk for the participants and the likelihood of a severe harm is low. In order not to cause any harm to the students in the experiment group, the same researcher provided practical training again after the study was completed. Furthermore, students could anytime withdraw from the study and the results they provided in the questionnaire forms did not affect their academic performances.

DISCUSSION

There is a global paradigm shift from teacher-centered learning to student-centered learning [28]. Besides faculty-led lessons, peer mentoring appeared increasingly favorable as an educational intervention [29]. Accordingly, aim of this study is to evaluate the effect of peer mentoring model used to teach peripheral intravenous catheter placement on knowledge, skills, self-confidence, satisfaction and symptoms of fear of nursing students. This study found that the peer mentoring model was as effective as the traditional teaching model in gaining skills of peripheral intravenous catheter placement, and the students' self-confidence and satisfaction were higher.

In the study, it was determined that the pretest knowledge scores of the students in the control group were lower than the experimental group and there was a moderate increase in the post-test scores compared to the experimental group. Due to the higher academic achievement of the students in the experimental group, the pre-test mean scores may have been higher than the control group. When PIVC knowledge and skills of students were evaluated, there was no statistical difference between the knowledge and skill mean scores of the students who had peer mentoring model and who had traditional teaching model. Review of the studies in the literature, which evaluated knowledge and skill effects of peer mentorship revealed that knowledge and skills of students increased with the help of collaborative learning [7,9,21].

Table 4. Distribution of symptoms of fear in the experimental and control groups (n=101)

Symptoms	Experimental Group				Control Group				p
	Yes	%	No	%	Yes	%	No	%	
Tightness, pain, and discomfort in the chest	6	12	44	88	7	13.7	44	86.3	0.796
Feeling tense	17	34	33	66	32	62.7	19	37.3	**0.004**
Blurred vision	3	6	47	94	4	7.8	47	92.2	0.715
Sweaty and cold hands	13	26	37	74	21	41.2	30	58.9	0.070
Feeling dizzy or dizziness	3	6	47	94	4	7.8	47	92.2	0.715
Feeling of fainting	2	4	48	96	1	2	50	98.0	0.546
Tiredness	15	30	35	70	15	29.4	36	70.6	0.948
Fainting	-	-	50	100	-	-	51	100	-
Dreamlike feelings	6	12	44	88	5	9.8	46	90.2	0.728
Palpitation	7	14	43	86	13	25.5	38	74.5	0.147
Significant restlessness	11	22	39	78	12	23.5	39	76.5	0.855
Feeling like the room is spinning	5	10	45	90	1	2	50	98.0	0.087
Nausea	5	10	45	90	7	13.7	44	86.3	0.563
Sweating	14	28	36	72	18	35.3	33	64.7	0.431
Tension in the muscles	10	20	40	80	18	35.3	33	64.7	0.086
Shivering	17	34	33	66	20	39.2	31	60.8	0.586
Walking distressed	4	8	46	92	5	9.8	46	90.2	0.750

X^2: chi-square test

The study conducted by El-Sayed et al. [8], found that peer mentoring was more effective than the classical teaching method in increasing the knowledge and skills of the students [8]. When mentors and mentees are not suitable for each other, the relationship and bond of mentor and mentee is affected over time due to personal attitudes. This reduces the effectiveness of the mentoring practice [30,31]. Since this was the case in this study, a different result may have been obtained from other studies. In addition, it is thought that this study result is due to reasons such as the anxiety of the mentor students who take the role of trainers

for the first time and the fact that the mentees see the mentors as friends [28].

In this study, it was observed that self-confidence and satisfaction level of the students who had the peer mentoring model when performing PIVC was higher. Different studies on peer mentoring reported that peer mentoring increased students' self-confidence [3,9], gave a sense of independence [32], increased their self-efficacy [10,33], increased their motivation [34,35], increased communication and collaboration [3,21], and that students were satisfied with the peer mentoring model [8,10,17,32]. These results support the findings of the study. In addition, it is stated in the literature that mentors and mentees feel more comfortable than faculty lecturers due to their close age [28]. For this reason, the self-confidence and satisfaction of the students who applied the peer mentoring method may have been found to be higher.

Although students working with peer mentors experienced less symptoms of fear, only the feeling tense symptom was experienced significantly more compared to the control group. Studies on peer mentoring reported that students felt less stress and anxiety during the procedure, which is similar to our findings [3,21]. In addition, another study states that peer mentoring helped reduce stress and anxiety in young people [36]. In addition, the students in the control group may not have experienced more anxiety due to the fear of being judged and evaluated by the instructor.

Clinical skills training is an educational process in which students put their theoretical knowledge into practice. The results of this study suggest that peer mentoring model should not be used alone during the education process but rather supported by teaching provided by instructors and that developing a standard to identify mentor students is important.

Study Limitations

The limitation of the study is that the results obtained are not generalizable since they belong only to this sample group and can only be used for PIVC application skills. In addition, the other limitations of the study are that the students were not assigned by stratified randomization according to their achievement levels and the study was conducted with a single observer.

CONCLUSION

This study found that the peer mentoring model was as effective as the traditional teaching model in gaining knowledge and skills of peripheral intravenous catheter placement, and the students' self-confidence and satisfaction were higher. These results can be used to make revisions in the curriculum in Turkey and use peer mentoring in teaching skills. In addition, these results revealed the importance of student-centered learning and prepared students for their future clinical educator roles. Based on these results, it is recommended to use the mentoring model to support the traditional teaching model to tech other skills in the nursing curriculum and to conduct studies for this model.

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