

Impact of the Peer Education Model on Nursing Students' Anxiety and Psychomotor Skill Performance: A Quasi-Experimental Study

A Bahar, E Kocaçal¹, GB Maraş²

Yukse İhtisas University,
Faculty of Health Sciences,
Fundamentals of Nursing,
¹Izmir Demokrasi University,
Faculty of Health Sciences,
Fundamentals of Nursing,
Ankara, ²Izmir Demokrasi
University, Vocational School
of Health Services, İzmir,
Turkey

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ABSTRACT

Background: Peer-assisted education (PAE) is a collaborative and active learning strategy in which another student or another student group teaches one group of students. This model is quite widely used in social and health science vocational education. **Aim:** This study was carried out to determine the effect of peer education on clinical skill learning and anxiety in nursing students. A quasi-experimental and a single-blinded design were used. **Subjects and Methods:** This study was conducted using experimental ($n = 45$) and control groups ($n = 47$) in a university in the Central Anatolia Region, Turkey. A total of 92 students were included. The experimental group received peer education nursing skills. The control group also received education in the traditional model. An Objective Structured Clinical Examination (OSCE) pretest and posttest were used to assess student performance. **Results:** It was found that the total scores of posttraining exam success in both experimental and control groups increased (35.20 ± 4.63 ; 36.70 ± 5.36 , respectively) and there was no statistically significant difference between the two groups ($P > 0.264$). The posttest scores of anxiety in the experimental group were less than the control group (30.18 ± 2.25 ; 41.21 ± 4.20 , respectively). **Conclusions:** The use of the peer education model in nursing education has been found to reduce the level of learning anxiety and positively affect psycho-motor skill acquisition. It is proposed to be used as an alternative method in vocational skills training within this context in this area.

KEYWORDS: Anxiety, peer education model, psychomotor skill

INTRODUCTION

In recent years, to provide a more suitable educational environment in universities, the use of innovative and collaborative educational methods, in which students are involved in active learning processes, has been increasing.^[1-3] Peer-assisted education (PAE), which is frequently used in higher education programs, is one of these methods. Peer education is a model in which another more experienced student teaches one or more students in the same group.^[4,5] For the first time in history, the peer-assisted education model was used by Aristotle's students, and officially by Topping *et al* (1998)^[2,4,6]

In the literature, although the concept of peer education is used together with the terms of peer counseling,

peer-assisted learning, and peer coaching, it is defined as the improvement of knowledge and skills through active support between people of equal status.^[4,6-8] The peer educator, which is one of the terms mentioned in this model, is the person who is not a professional educator but an experienced person assisting others to learn. Peers are individuals of the same age and similar social status who receive education from a peer educator.^[5,8,9] Unlike traditional models, this model eliminates the possible power imbalance and reward penalty environment caused by hierarchy due to students receiving education from

Address for correspondence: Dr. A Bahar,

Yukse İhtisas University, Faculty of Health Sciences, Department
of Fundamentals of Nursing, Ankara, Turkey.
E-mail: arzbahar@gmail.com

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their peers. It has been reported that this reduces the level of anxiety of students who are receiving education and increases school success, while it is reported that this model also increases the leadership skills and self-confidence of the peer educators.^[10-13] Under the circumstances where there is a decrease in resources and an increase in the number of students, peer coaching is shown as a good alternative for providing an interactive learning environment. This has led to the acceptance of Peer-Assisted Learning by health educators.^[5,14]

Psycho-motor skill learning involved in theory and practice-based nursing education is an essential component of the educational curriculum.^[15-17] Deficiencies or inaccuracies in the psycho-motor skill learning of nursing students lead to application errors and threaten patient safety. Within this context, it is crucial to make the students acquire psycho-motor skills in the best way during undergraduate education.^[17-19] During skill training, which is a highly stressful experience, especially in the early years of nursing education, teaching methods that reduce anxiety should be used.^[11,15,20] At this point, it is regarded as an alternative in education when the advantages of peer education such as consolidating the learning, providing an active, collaborative, and stress-free learning environment, giving the students the opportunity of freely asking questions to their peers, reducing the anxiety and allowing group discussions, are considered.^[5,6,13,21]

In the literature, peer education is mainly used in medicine and physiotherapy in the theoretical learning of physical and neurological examination, cardiac life support skills, and anatomy and radiology courses. This model is also noted to support theoretical knowledge and psycho-motor skill learning.^[1,16,22,23,24,25]

Issues like an excessive number of students per educator, reduced support for clinician nurses due to workload, and lack of equal access to high-cost simulation opportunities lead to problems in nursing primary skill education.^[19,26] For this reason, alternative methods such as peer training are required in nursing skill education. However, peer education, which began to be used in nursing in the 1980s, does not seem to find much space in education due to the adoption of educators into other educational models and their anxiety of not being able to control peer groups.^[5,6,13] Many study results are stating that students experience serious anxiety during skill training. Therefore, although many studies were showing how technical skill training affects performance in peer education, it was important to determine how it affects the level of anxiety in terms of demonstrating the effectiveness of the model.^[18,20,27] In nursing, there are studies in which the peer education model gives

theoretical courses; however, the number of studies in which this model gives psycho-motor skill training is limited.^[28-33]

In these studies, where the impact of peer education was evaluated, it was shown that students gave positive feedback and that the method contributed to nursing education.^[11,28,33] Although its use in education and health sciences is increasing, studies evaluating the effect of the peer education model on nursing skills both teaching performance and anxiety levels were still quite limited.^[10,28,29] Our research aims to determine both the effect of peer education on clinical skill learning and anxiety in nursing students, starting from this perspective.

STUDY DESIGN

This study was conducted in a semi-experimental single-blind layout with a pretest and final test design. In the first phase of the study, 10 senior students who voluntarily wanted to give peer education were identified. Researchers trained these students before being selected as peer educators. For the first time, educators were given 10 hours of theoretical training on peer education and respiratory system applications. A theoretical examination was applied to determine their competencies after training. Students who scored 80 and above during the examination received 10 hours of skills training through the demonstration method. Three weeks after the training, the training results were evaluated by re-training and conducting a Structured Clinical Skills Practice Exam (OSCE) skill proficiency exam by the responsible researchers. After determining four successful students as peer educators by the evaluation, sample selection was made.

Before psycho-motor skill training, students were assigned to practice ($n = 45$) and control groups ($n = 47$) by the random selection method. Nursing skills training was given to the students in the practice group by demonstration method by peer educators. For the students in the control group, the education was given by the instructors of the course. Before the skill training on respiratory system applications was conducted in the laboratory, the OSCE pretest was conducted. After training, an OSCE posttest was performed 2 weeks later [Figure 1].

Sample size determination

The sample consisted of first-grader nursing students ($n = 92$) in a private university in the Central Anatolia Region, Turkey. Students selected by random nonprobability sampling in the study were divided into practice (45) and control groups (47). As a result of the researchers' conducted G power analysis to determine the sample size, the sample power was found to be 0.81.

Data collection

The data were collected through the socio-demographic characteristics data collection form, the OSCE, and the state-trait anxiety scale.

The survey form created by the researchers consists of 20 questions, including the socio-demographic characteristics of the students, such as age, gender, academic achievement, and their views on the peer education model.

The State-Trait Anxiety Scale (STAI) that was used to determine the level of anxiety of students in the study was developed by Spielberger *et al.* (1970) and adapted to Turkish society by Öner and Le Compte (1985).^[34] There are 40 expressions that individuals can use to express their feelings on the scale. The first twenty of them measure the level of anxiety associated with the state and given as follows: “None” (1), “A Little” (2), “A Lot” (3), “Completely” (4). In this section, expressions are divided into direct and inversion types. Inversion type expressions are given in items 1., 2., 5., 8., 10., 11., 15., 16., 19., and 20. State anxiety scores are obtained by adding the number 50, which is the literal value of the State Anxiety Scale, to the value obtained by subtracting the total score of inversion type expressions from the total score of direct type expressions. Items between 21 and 40 of the scale measure an individual’s level of sustained anxiety. In our study, the state anxiety levels of participants were determined using the first 20

items of this scale. 0–19 points obtained from the scale indicate a lack of anxiety, 20–39 points indicate a light state of anxiety, 40–59 points indicate a medium state of anxiety, and 60–79 points indicate a severe state of anxiety. A scaled score of 60 and above indicates that individuals need professional help. The Cronbach alpha value of the scale was found to be 0.81.^[34] However, Cronbach’s alpha value was found as 0.81 in this study.

An OSCE was conducted to evaluate peer educators, and based on peer education and traditional models, the success of the intervention and control group on the psycho-motor skills was evaluated. Three different assessment stations were created in the skills laboratory to evaluate airway application, oropharyngeal-nasotracheal aspiration, and mask and oxygen application skills for conducting the OSCE examination. They were asked to apply their skills at these stations according to the skill checklists prepared in compliance with the literature.^[34,35,36] Skill processing steps in checklists were rated as “1” point for each step performed correctly and “0” for each step skipped or performed incorrectly. The highest score for airway, mask, and oxygen application skills was determined as “12” points, and the highest score for nasotracheal aspiration application skills was determined as “20” points. After a warning sound indicating that the time given for each skill in the examination has expired, the student moved to the next station and completed the practice of all the skills. The evaluations were conducted by another instructor other than the researchers to avoid bias.

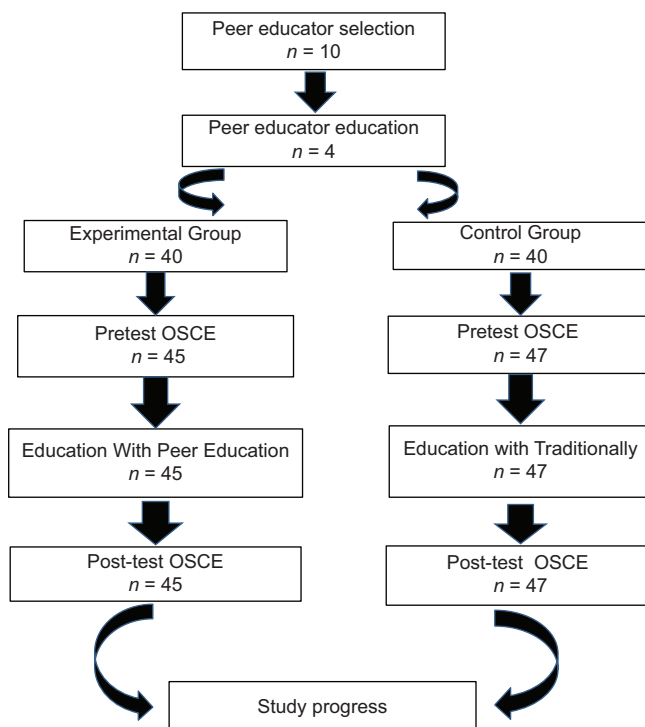


Figure 1: Study progress

Table 1: Characteristics of participants

Characteristics	Experimental group n=45		Control Group n=47	
	n	%	n	%
Gender				
Male	33	73	36	76
Female	12	27	11	24
Age Group				
19-20	21	46	22	48
21-22	14	31	18	38
22 and over	10	23	7	14
Would you like to be educated by your own peers?				
Yes	34	75	41	87
No	11	13	6	13
Do you think that skills training can be provided effectively with peer education?				
Yes	36	80	42	89
No	9	20	5	11
Are you satisfied with the peer education you were provided?				
Yes	37	82	0.0	0.0
Partly	6	13	0.0	0.0
No	2	04	0.0	0.0

Table 2: Effects of peer education on respiratory system nursing administration scores of OSCE

Variables	OSCE Scores		
	Pretest X±SD	Posttest X±SD	Pretest and posttest difference X±SD
Airway application			
Experimental Group	7.03±3.746	10.06±4.25	3.03±2.78
Control Group	7.51±6.27	11.12±3.64	3.61±5.36
P	0.625	0.121	0.074
t/Z	1.72 ^a	4.96 ^a	3.56 ^a
Oxygen application with a mask			
Experimental Group	6.42±3.24	10.68±5.23	4.16±2.64
Control Group	5.91±2.78	9.86±6.25	3.88±3.45
P	0.248 ^a	0.059 ^a	0.084 ^a
t/Z	1.86	2.496	3.25
Nasotracheal aspiration application			
Experimental Group	9.25±4.32	14.46±1.23	5.21±5.22
Control Group	8.64±2.64	15.72±2.82	7.08±4.62
P	0.138	0.076	0.091
t/Z	3.56 ^b	2.36 ^b	4.84 ^b
Total OSCE scores			
Experimental Group	22.70±3.78	35.20±4.63	12.50±7.54
Control Group	22.13±2.96	36.70±5.36	14.57±2.81
P	0.781 ^a	0.264 ^a	0.658 ^a
t/Z	3.410,09	1.85	4.39

^arepresents "Man Whitney U test and, the ^brepresents the "Independent t test"

Table 3: Anxiety states of participants after the pretest and posttest

	Experimental Group n=45 X±SD	Control Group n=47 X±SD	Min	Max	P	T
State Anxiety pretest scores	58.72±5.93	55.44±3.38	34	74	0.58	0.76
State Anxiety posttest scores	30.18±2.25	41.21±4.20	24	68	0.02*	1.24

* Significant, $P < 0.05$

Analysis

Analysis of the data obtained from the study was performed in SPSS (Statistical Package for Social Science) 24.0 program. When analyzing the data, numerical and percentile distribution, t-test, Mann–Whitney U test, and variance analysis were used. The significance level was accepted as $P < 0.05$.

Ethical considerations

The Ethical approval was obtained from the university's scientific, ethical board (IRB: 99950669/11). Written consent was also received from the volunteer nursing students after explaining the study's objectives and the time procedure. A face-to-face interview technique was used to collect data in the laboratory. Questionnaire forms were filled

out based on students' self-notification. The research was conducted following Helsinki Declaration on Human Rights.

RESULTS

It was determined that 73% of the students were male, and 46% were in the 19–20 age group. In addition, 82% of the students in the experimental group reported that they were satisfied with peer-assisted education [Table 1]. The author is strongly advised to crosscheck the values on Tables 1 to 3 and to make sure that the values tally with what is stated in the text for consistency of values.

There was no significant difference between the pretest scores of OSCE in the groups in terms of the applications of the airway ($P = 0.065$), oxygen delivery via a mask ($P = 0.248$), and nasotracheal aspiration ($P = 3.56$). The total OSCE scores were also found to be significantly different ($P = 0.781$) in the groups [Table 2]. The control group's posttest scores of the airway application (11.12 ± 3.64) and nasotracheal aspiration (15.72 ± 2.82) and total scores (36.70 ± 5.36) were higher than the scores in the experimental group. Despite these findings, the results were not significantly different ($P = 0.121$, $P = 0.076$, $P = 0.264$, respectively) [Table 2].

Although the pre-post test scores between the groups in the airway application (3.61 ± 5.36), ($P = 0.074$) and nasotracheal suctioning (7.08 ± 4.62) ($P = 0.091$) are statistically in significant, the total OSCE scores (14.57 ± 2.81) ($P = 0.658$) was higher in the control group than experimental group.

Pre-post test scores differences of oxygen delivery via a mask in the experimental group (4.16 ± 2.64) were higher than the control group (3.88 ± 3.45). However, this finding was not also statistically significant ($P = 0.084$).

No statistically significant difference was found ($t = 0.76$, $P = 0.58$) between the average STAI pretest scores of the experimental group (58.72 ± 5.93) and the control group (55.44 ± 3.38) [Table 3]. A significant difference ($t = 1.24$, $P = 0.02$) was found between the average score of the experimental group (30.18 ± 2.25) and the control group (41.21 ± 4.20) in the posttest OSCE after peer training and traditional psycho-motor skill training. It was determined that both groups had a decrease in STAI score averages after skill training, and the decrease in the experimental group was more significant than in the other group.

DISCUSSION

Peer education is a frequently used educational model in higher education that provides an innovative, active learning environment and increases cooperation. Our study determined that the group of students who

received psycho-motor skill training for respiratory system applications by peer education method had lower anxiety levels. The students were also found to be happy to receive training with this model.

We see that similar results are revealed in studies where the peer education model was used in nursing students and their anxiety level was investigated.^[27,36-39] As a result of their focus interviews with peer-educated students, Ravanipour *et al.*^[39] (2015) reported that participants were satisfied with their peer education and experienced much less stress than the traditional model. In another study ($n = 141$), PAE was found to be effective in reducing the anxiety of nursing students and supporting their clinical self-efficacy.^[38] Similarly, a study by Raymond and Sheppard (2018) showed that peer education creates less stress during learning, positively affecting self-efficacy.^[27] In parallel with our research, these results show that peer education increases collaboration among students, increases their self-efficacy, and reduces negative emotions such as anxiety and stress in the educational environment.

As a result of the OSCE examination in our study, despite the increase in final test scores of both groups, we determined that there was no statistical difference between pretest and final test scores. This result shows that peer education in psycho-motor skill training is as effective as the traditional method and contributes to learning. Dikmen *et al.* (2017) reported that nursing students who received peer education were more successful than control group.^[28] Similarly, Palson *et al.* (2017) stated that there is no difference between peer education and traditional education methods in terms of academic success of nursing students and that the peer education model is effective in increasing students' level of self-efficacy.^[31] Besides these works, Shohani *et al.* (2020) and Fard *et al.* (2020) reported no difference between peer education and the traditional method in terms of students' skill performance and that students are satisfied with peer education.^[29,32] Another study with students studying in different health disciplines found no difference between peer education and the traditional model in terms of their effect on students' skill performance.^[40] These results are consistent with our research.

Study limitations

The study had several limitations. First, it was not possible to compound a particular video for all nursing skills, and just respiratory skills videos were incorporated into the contents of the intervention. Another limitation was the small size of the sample, and the setting was just one institution. Finally, the use of video in the flipped classroom group might have

positively influenced the scores and performances of students. Moreover, to evaluate the effectiveness of the training, the permanence test was not conducted after a certain period.

CONCLUSION

As a result of our study, we found that the peer education model is as effective as the traditional education model in terms of the students' psycho-motor skill level and reduces anxiety. Because of the lack of teachers in parallel with the growing number of students in nursing, the limitations that students experience in finding role models, and the need for flexible models in collaborative and educational environments, the peer education model can be an excellent alternative to traditional education model. Within this context, more widespread use of the peer education model in skills training is believed to contribute to learning. It is recommended to conduct studies evaluating the effect of the peer education model in different sample groups.

Future implications

Given that traditional models in nursing education cannot meet today's educational demands, the integration of peer education into educational programs can be considered an opportunity to increase the quality of education. Additionally, both qualitative and quantitative research designs of this model that will be carried out will assess the students' experiences and attitudes, and recommendations that will enable more effective use of this model can be found. Besides these suggestions, it is believed that planning studies to determine the opinions and recommendations of academicians for providing training on the peer education model will make an essential contribution to the integration of the model into nursing education.

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Conflicts of interest

There are no conflicts of interest.

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