Original Article

The Impact of Peer Support Provided to the First-Year Students of Nursing on the Clinical Stress and Psychomotor Nursing Skills

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Abstract

Background: This study was conducted to determine the impact of peer-assisted learning on the clinical stress levels and their psychomotor nursing skills of first-year nursing students who performed clinical practices for the first time.
Method: Randomized controlled study. The study was conducted between January and May 2019 with the first-year nursing students who were studying at the Nursing Faculty. 120 first-year nursing students (experimental= 60, control= 60). Students of the experimental group performed clinical practices with their peers and professional instructors, and control group performed the clinical practices with the instructor.
Results and Conclusion: Accordingly, the difference between the post-test scores regarding the clinical stress levels and psychomotor skills of the students in both groups was statistically significant (p<0.05). This study indicated that first-year students of nursing who received peer support had lower clinical stress levels and better progress in developing psychomotor nursing skills.

Keywords: Peer-Assisted Learning, Nursing Education Stress, Psychomotor Nursing Skills, Nursing Students

Background

Nursing education consists of theoretical and practical departments that complete one another. Learning the basic psychomotor nursing skills is an important part of nursing curriculum for first-year nursing students and generally a stressful experience for these students (Brannagan et al., 2013). Laboratory and clinical environment for nursing education enables students "to learn by practicing". The negative experiences in this regard adversely affect students due to the stress they cause (Unver and Albayrak, 2013). The studies performed to determine the stress sources for nursing students indicated that students suffered from stress the most during the clinical education (Chen, & Hung, 2014; Wolf et al., 2015). These stress sources include deficiencies in professional information and skills, failure in patient care and practical procedures, fear of making a mistake, problems experienced in using the medical instruments, trainer-related stress, and the relationship between the personnel-students (Sheu et al., 2002; Pulido & Martos et al., 2012; Arabacı et al., 2015; Oner Altiok, & Ustun, 2013; Levett & Jones et al., 2009). Students' exposure to long-term and uncontrolled stress may adversely affect their professional identities, medical states and academic achievements (Edwards et al., 2010; Oner Altiok, & Ustun, 2013; Karaca et al., 2017). Therefore, clinical environment and laboratory should facilitate the process of acquiring information and skill of solving problems (Tiwari et al., 2005).

The increased number of students studying nursing in Turkey, limited number of instructors and higher number of students pers instructor (approximately 1/53) compared to the European and world standards adversely affect students' efforts to acquire clinical skills (YOK (HEC),

2017). It has become a necessity to use alternative methods along with the traditional teaching methods in improving the educational activities for students' clinical skills (Unver and Albayrak, 2013). Peer-assisted learning is one of these alternative methods.

Peer-assisted learning (PAL) is a planned education model used between the groups which consist of students that have social interaction and that are equal to one another in terms of various demographic variables (age, education etc.) to change one another's knowledge and attitudes (Topping, 2001; Gazula et al., 2017; Sancı and Kelleci, 2019). Absence of a hierarchical relationship, authority imbalance and concepts of rewarding and punishing, and ability to ask questions in peer-assisted learning decrease students' stress levels (Waddell, & Dunn, 2005; Gillespie, 2000; Asci et al., 2016). In addition, the studies conducted with peers in the literature report numerous benefits of peer-assisted learning such as increasing students' freedom of speech as students felt more comfortable and safer (Mete et al., 2011; Korkmaz and Kiran Esen, 2012), boosting their motivations, increasing the satisfaction from the educational environment (Yelpaze & Ozkamalı, 2015; Asci et al., 2016), developing team work skills (Chojecki et al., 2010), reducing anxiety (Stenberg, & Carlson, 2015), improving self-sufficiency (Austria et al., 2013; Hellstrom-Hyson et al., 2012) and self-esteem (Kassab et al., 2005), and increasing the academic achievements (Han et al., 2015). Considering the fact that university education contains different stressors and acts as a period requiring adaptation, presence of peer support will increase students' adaptation to decrease their stress levels. This study was planned with the idea that the peer support provided within the nursing education, particularly when first clinical practice skills are learned, will decrease students' stress and be critical in improving their learning skills.

This study was conducted to determine the impact of peer-assisted learning on the clinical stress levels of first-year nursing students who performed clinical practices for the first time and their psychomotor skills.

Method

This study was designed to be an experimental research model with post-test control group.The study was conducted between January and May 2019 with the first-year nursing students who were studying at the Nursing Faculty. The population consisted of first-year nursing students while the sample included 120 students (experimental group = 60, control group = 60) as determined with the Power analysis (two-way importance, 0.5 as impact size, 0.05 as the level of significance, and 0.95 as the power of representing the population). With the idea that some might abandon, 10 more students were selected. Students were selected using the simple random sampling method, and they were randomly assigned to the experimental and control groups using the table of random numbers.
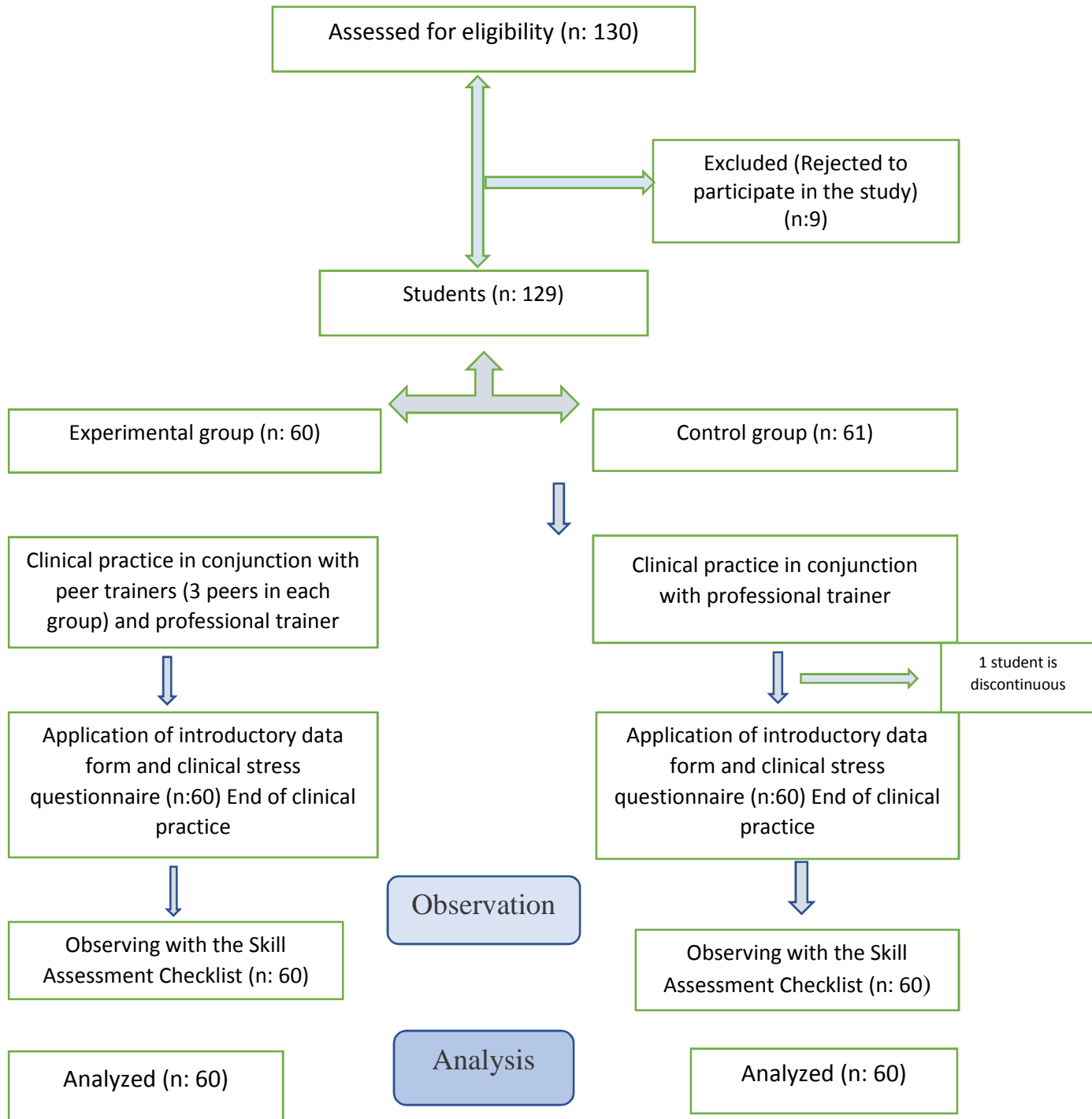
Data collection

The students performed clinical practices for 12 hours a week (1.5 days) for 12 weeks. They conducted these practices as groups with 12-14 students. There were instructors responsible for each group. 5 experimental and 5 control groups were formed (12 students in each group). A distribution of three peers for students from the experimental group was performed. Students of the experimental group performed clinical practices with their peers and professional instructors. They were introduced to their peers on the first week, initiating the communication between them. Students in the experimental group maintained the clinical practices with the peer students. Students in the control group performed the clinical practices with the instructor.

Data were collected from the students in experimental and control groups through the questionnaire and observation methods. Students groups performing practices in two different hospitals were selected to prevent any sorts of interaction between the groups. Following the clinical practices, an introductory information form and questionnaires with clinical stress items were administered to students. Necessary explanations were performed, and necessary duration was granted to them to complete the questionnaires after their verbal or written consents were received. Data were collected using the face-to-face interview method.

Unattended observation was performed to monitor and record students' skills for nine weeks. No observation was done in the first three weeks of clinical practices as skill development was thought to be insufficient. During the next weeks, the researcher completed the checklist while students performed the clinical practices on

the patients. Skills of each student were observed for twice. Mean scores from both observations were used to perform statistical comparison (Figure 1).

Figure 1. The Process of Sampling

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                    ┌─────────────────────────────────────┐
                    │   Assessed for eligibility (n: 130)  │
                    └─────────────────────────────────────┘
                                     │
                                     │        ┌─────────────────────────┐
                                     │───────▶│  Excluded (Rejected to  │
                                     │        │ participate in the study)│
                                     │        │         (n:9)           │
                                     │        └─────────────────────────┘
                    ┌─────────────────────────────────────┐
                    │          Students (n: 129)           │
                    └─────────────────────────────────────┘
                                     │
          ┌──────────────────────────┴──────────────────────────┐
          │                                                      │
┌──────────────────────────┐              ┌──────────────────────────┐
│ Experimental group (n: 60)│              │   Control group (n: 61)  │
└──────────────────────────┘              └──────────────────────────┘
          │                                           │
┌──────────────────────────┐              ┌──────────────────────────┐
│ Clinical practice in      │              │ Clinical practice in     │
│ conjunction with peer     │              │ conjunction with         │
│ trainers (3 peers in each │              │ professional trainer     │
│ group) and professional   │              │                          │
│ trainer                   │              │                          │
└──────────────────────────┘              └──────────────────────────┘
          │                                           │        ┌──────────────────┐
          │                                           │───────▶│ 1 student is     │
          │                                           │        │ discontinuous    │
┌──────────────────────────┐              ┌──────────────────────────┐└──────────────────┘
│ Application of introductory│             │ Application of introductory│
│ data form and clinical    │             │ data form and clinical    │
│ stress questionnaire      │             │ stress questionnaire      │
│ (n:60) End of clinical    │             │ (n:60) End of clinical    │
│ practice                  │             │ practice                  │
└──────────────────────────┘              └──────────────────────────┘
          │                                           │
┌──────────────────────────┐  [Observation]  ┌──────────────────────────┐
│ Observing with the Skill  │              │ Observing with the Skill  │
│ Assessment Checklist (n:60)│             │ Assessment Checklist (n:60)│
└──────────────────────────┘              └──────────────────────────┘

┌──────────────────────────┐   [Analysis]    ┌──────────────────────────┐
│    Analyzed (n: 60)       │              │    Analyzed (n: 60)       │
└──────────────────────────┘              └──────────────────────────┘
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Data Collection Tools: "Introductory Questionnaire Form" containing items questioning students' socio-demographic characteristics and "Pagana's Clinical Stress Questionnaire" were used to collect data, while "Skill Assessment Checklist" formed by the researcher was used to evaluate students' learning skills.

Clinical Stress Questionnaire (CSQ): This questionnaire was developed by Pagana in 1989 (Pagana, 1989). Its Turkish validity and reliability study were performed by Sendir and Acaroglu in 2003. The questionnaire was developed to determine the initial stress levels that concern nursing students in their first clinical practices or that require them to make extra efforts in this regard. This five-point Likert type questionnaire had 20 items. The score to be obtained from this scale ranged from 0 to 80 points. Low scores indicated low stress level while high scores indicated high stress level (Sendir and Acaroglu, 2008).

Skill Assessment Checklist: A particular control list was prepared for each relevant skill by the researchers based on the current control lists in nursing course books and relevant literature (Ay, 2019., Astı and Karadag, 2016; Lowry-Lehnen, 2018). Use of skill-specific checklists ensures the objective assessment of psychomotor skill competence (Lammers et al. 2008). Five skill checklists were formed; if the skill was displayed correctly, one point was given while an incorrect or deficient display meant zero point. Total score was calculated with the scores collected from each checklist. The checklist and scoring were as follows:

13 items for the skill of measuring pulse and respiratory rates (0-13 points), 23 items for the skill of measuring blood pressure (0-23 points), 16 items for the skill of withdrawing medication from an ampule (0-16 points), 18 items for the skill of withdrawing medication from a vial (0-18 points), 20 items for the skill of performing subcutaneous injection (0-20 points)

To assess the contextual validity of control lists, forms were sent to four instructors teaching Nursing Principles via mail, and their ideas were taken into account. Kendall's W analysis – a non-parametrical test – was used to examine the concordance between the experts' ideas (Kendall W=0.240; p>0.05). Accordingly, forms were found to be suitable for using to measure the relevant skills.

Selection and education of peers:

1. Fifteen peers were selected from the voluntary third and fourth-year students who had strong communication skills.

2. Necessary information regarding the peer-assisted learning was provided to the peers: What is peer-assisted learning? Why is it used? What is the purpose in using this method?

3. A theoretical training session was conducted in regard to performing clinical training, students' adaptation to the clinics, measuring vital signs and methods of dispensing medications for four hours.

4. The skills taught to the peers were displayed in the laboratory environment, their skill levels were assessed, and they were provided to opportunity to display their skills once again when they made a mistake.

5. At the last phase, peer instructors' success levels were found to be good.

Data Analysis: The statistical analysis of the data was performed using the IBM Statistical Package for Social Science (SPSS) version 22. While assessing the data, statistical methods such as percentage, mean values and standard deviation were used. To compare the control variables of both groups, chi-square and *t* tests were performed. In addition, *t* test was performed again in independent groups to compare the mean scores of both groups.

Ethical Approval: Ethical Committee of Scientific Studies and Publications within the Institute of Health Sciences at a University gave ethical consent (2019/7-33) for the study. In addition, the deanery of the faculty gave its written approval. The objectives of the study were explained to the participants who were told that they could abandon the study whenever they wished. Then, their written or verbal consents were obtained. They were also informed about the study plan and where the data would be used, and the principle of "Respect to Human Dignity" was observed. A voluntary basis was followed in this study, fulfilling the principle of "Respect to Autonomy". Moreover, the privacy of the data was considered and "Privacy and Protection of Privacy" principle was ensured.

Results

The difference between the socio-demographic characteristics and control variables of the participants is presented in Table 1. According to

the results, the difference between the demographic variables of students was not significant (p>0.05), meaning the groups displayed similar characteristics. Mean age of 91.7% in the experimental group ranged between 18 and 20 years (19.3±1.2). Of the students in this group, 68.3% were female, 70% graduated from an Anatolian high school, and 75% had moderate economic status. Moreover, 26.7% enrolled to the nursing department voluntarily, 35% were happy to study in this department, and 66.7% liked the clinical practices. Mean age of 85% in the control group varied between 18 and 20 years (19.6±1.0). Of them, 76.7% were female, 76.7% were Anatolian high school graduates and 83.3% had moderate economic status. Of the students in this group, 43.3% enrolled to the nursing department voluntarily, 40% were happy to study in this department and 65% liked the clinical practices (Table 1).

The difference between students' descriptive characteristics and clinical stress levels indicated that experimental group had lower clinical stress levels than the control group. The difference between the variables of gender, economic status, voluntary enrolment to nursing department and approval to clinical practices, and mean clinical stress scale scores was statistically significant (p<0.05) for the nursing students in the experimental group. Students who were female and aged between 18 and 20 years, had poor economic status, enrolled to the nursing department involuntarily and thus were unhappy, and disliked the clinical practices had higher stress scores. The difference between the variables of gender, economic status, voluntary enrolment to nursing department and approval to clinical practices, and mean clinical stress scale scores was statistically significant (p<0.05) for the nursing students in the control group. Students who were female, had poor economic status, enrolled to the nursing department involuntarily and thus were unhappy, and disliked the clinical practices had higher stress scores (Table 2).

The inter-group comparisons toward the post-test mean scores of experimental and control groups are present in Table 3. Accordingly, the difference between the post-test scores regarding the clinical stress levels and clinical skills of the students in both groups was statistically significant. The students in the experimental group received 9.4±1.0 points from the skill checklist of measuring the pulse and respiratory rates while the control group obtained 8.9±1.0 points, indicating a statistically significant difference (p<0.05). Regarding the skill scores from measuring blood pressure, withdrawing medication from an ampule and vial, and performing subcutaneous injection, students in the experimental group had higher scores than those in the control group, meaning a statistically significant difference (p<0.05) (Table 3).

Table 1. Comparison of descriptive characteristics and control variables of students in experimental and control groups

Characteristics	Experimental group n=60		Control group n=60		Test and significance
	Number	%	Number	%	
Age					
18-20	55	91.7	51	85.0	X^2=1.214
21 and above	5	8.3	9	15.0	p= .197
Gender					
Female	41	68.3	46	76.7	X^2=1.045
Male	19	31.7	14	23.3	p=.207
Graduated School					
Anatolian high school	42	70.0	46	76.7	X^2=.048
Science high school	18	30.0	14	23.3	p=.500

Economic level					
Good	10	16.7	8	13.3	$X^2=.392$
Middle	45	75.0	50	83.3	p=.822
Bad	5	8.3	2	3.3	
Status of willing to come to nursing department					
Yes	16	26.7	26	43.3	$X^2=3.694$
No	25	41.7	20	33.3	p=.158
I'm undecided	19	31.7	14	23.3	
Are you happy to come to the nursing department?					
Yes	21	35.0	24	40.0	$X^2=.874$
No	7	11.7	9	15.0	p=.646
I'm undecided	32	53.3	27	45.0	
The state of liking clinical practice					
Yes	40	66.7	39	65.0	$X^2=.237$
No	6	10.0	5	8.3	p=.888
I'm undecided	14	23.3	16	26.7	

Table 2. Comparison of the difference between the control variables and clinical stress levels of the students in the experimental and control groups

Characteristics	Experimental group		Control group	
	Clinical Stress Questionnaire **X±SD**	**Test and Significance**	**Clinical Stress Questionnaire** **X±SD**	**Test and Significance**
Age				
18-20	27.8±7.7	MWU: 50.50	36.6±8.3	MWU:229.5
21 and above	26.9±5.3	p=.082	35.9±3.5	p=.720
Gender				
Female	30.6±7.8	MWU:307.0	36.5±6.4	MWU:292.0
Male	27.1±7.9	**p=.038***	33.9±5.8	**p=.025***
Graduated School				
Anatolian high school	26.1±7.5	MWU:288.5	36.9±7.5	MWU:303.5
Science high school	26.2±9.2	p=.705	36.4±8.6	p=746
Economic level				
Good	22.0±6.7	KW:5.316	34.6±7.9	KW:4.008
Middle	26.6±7.6	**p=.032***	36.5±7.6	**p=.013***
Bad	27.1±4.2		39.6±8.2	
Status of willing to come to nursing department				
Yes	24.4±9.2	KW:4.406	34.3±6.3	KW:2.474
No	29.1±7.4	**p=.003***	37.5±6.0	**p=.042***
I'm undecided	26.6±7.2		34.9±5.7	
Are you happy to come to the nursing department?				
Yes	26.2±7.6		34.4±5.9	
No	27.1±6.8	KW:.958	36.2±6.1	KW:2.867
I'm undecided	27.0±7.2	p=.320	35.4±5.7	p=.059
The state of liking clinical practice				
Yes	25.1±8.1	KW:4.866	32.1±6.4	KW:5.394
No	30.0±7.1	**p=.002***	37.6±5.9	**p=.000***
I'm undecided	27.1±6.4		35.8±4.8	

X: Mean, SD: Std. Deviation, KW: Kruskal-Wallis H Test

Table 3. Comparison of the Post-Test Scores of Both Groups from Clinical Stress Scale and Learning Skills

	POST TEST			
	Experimental group (n=60) **X±SD**	**Control group (n=60)** **X±SD**	**t**	**p**
Pagana's Clinical Stress Questionnaire	26.1±7.8	36.6±7.7	-7,330	**.000****
Skill of Measuring Pulse and Respiratory Rates	9.4±1.0	8.9±1.0	2,801	**.006****
Skill of Measuring Blood Pressure	17.3±1.2	15.9±1.8	4,893	**.000****
Skill of Withdrawing Medication from an Ampule	12.1±1.1	11.5±1.2	2,867	**.005****
Skill of Withdrawing Medication from a Vial	13.8±1.0	12.8±1.3	4,254	**.000****
Skill of Performing Subcutaneous Injection*	14.1±1.1	13.2±1.2	2,219	**.033****

*All students failed to perform injection
** p<0.05

Discussion

This study indicated that nursing students who performed practices with their peers during the clinical practice education had less clinical stress compared to the students who traditionally conducted their practices alongside an instructor, and the former was found to have developed better nursing skills.

Students' clinical stress levels were assessed at the end of clinical practices, and they were found to be low. Similarly, the study by Arabacı et al. indicated that students' mean clinical stress scores decreased significantly at the end of clinical practices (Arabacı et al., 2015). According to other relevant studies in the literature, students' clinical stress level which was high at the beginning of clinical practices significantly decreased at the end of these practices (Sirin et al., 2003; Su et al., 2018).

In addition, this study indicated that the mean Clinical Stress Scale score of students in the experimental group who performed practices with their peers was significantly lower than that of the students in the control group. The study conducted by Demir et al. in Turkey found that mentorship program improved students' self-esteem and self-awareness, and that it was

effective for students in coping with the stress arising from the university environment (Demir, et al., 2014). Many relevant studies from the literature that were conducted with students' peers found that peer support (mentorship) was effective in reducing students' anxiety and stress levels (Giordana & Wedin, 2010; Su et al., 2018; Kachaturoff, et al., 2019; Raymond, & Sheppard, 2018; Locken, & Norberg, 2005; Walker, & Verklan, 2016; Carey, et al., 2018). The results of the present study suited the findings of the relevant studies. The social and academic support received from the peers to decrease students' clinical stress level throughout their education, the communication established with the peers, and adaptation to the clinic is believed to have been effective in decreasing students' total stress level in this process.

Nursing students who performed clinical practices with their peers had significantly better psychomotor development compared to the control group. The skill scores regarding the measurements of pulse rate, respiratory rate and blood pressure, dispending medicines and performing subcutaneous injection were significantly higher than those of the control group. A relevant study conducted to assess the importance of peer support in anatomy dissection

course indicated that experiment group's self-assessment scores regarding the learning skills related to upper extremity dissection were significantly higher than those of the students in the control group, and that the students in the experimental group had better academic achievements (Han et al., 2015). Another relevant study reported that the competence on vital signs significantly increased following the practices repeated after the peer mentorship (Ross, 2019). The study by Yoo et al. indicated that the peer-assisted learning group had statistically and significantly higher scores than the control group guided by an instructor in terms of the performances from the practices of permanent urinary catheterization, wearing protective equipment before entering the quarantine room, and disposing the wastes (Yoo, et al., 2017).

Many studies from the relevant literature indicated that peer support was effective in students' psychomotor skill development (Koo, 2019; Kim, 2020; Bensfield, et al., 2008; Carey, et al., 2018; Carey, et al., 2019) and academic achievements (Thompson, 2008; Bayer, 2012; Guerra-Martn, 2017; DeBerard, et al., 2004; Nicpon, et al., 2006). However, there are limited number of studies assessing the skill development using the checklists (Ross, 2019). During the peer-assisted learning period, students' academic achievements and satisfaction increased as they could ask questions to their peers without getting shy, had a stress-free education environment, and received support from their peers (Unver, & Akbayrak 2013). According to a qualitative study conducted in Iran, students reported that peer support was effective in learning better without stress and reducing the concerns of making a mistake (Ravanipour, et al., 2015). The present study suggests that students' stress level decreased and development of their skills improved owing to receiving peer support during the clinical practices, ability to direct questions to the peers, and absence of any concerns regarding grading. Considering the fact that clinical environment increases students' stress levels, peer-assisted learning is important and necessary for decreasing the stress levels and developing psychomotor skills of the students, particularly the first-year ones. Moreover, this learning method should be commonly used in nursing curricula.

The difference between the students in experimental and control groups in regard to the variables of gender, economic status, voluntary enrolment in nursing department and approval toward the clinical practices, and their mean clinical stress scale scores was found to be statistically significant. Male students and those who had good financial status, enrolled to the nursing department voluntarily and liked the clinical practices had lower stress level. A relevant study from the literature indicated that students who enrolled to nursing department involuntarily, disliked their future profession, felt fear as well as stress and anxiety, and did not plan to perform nursing after graduation had higher state-trait anxiety and stress levels (Arabacı, et al., 2015). The intense stress may adversely affect students' clinical performance. Thus, the stress levels experienced by students in the clinical environment and impactful factors should be particularly examined.

Limitations: This study was conducted with the nursing students of a single school. The results can be generalized for the first-year students of this school but they cannot be accepted for all nursing students studying at different schools at different cities.

Conclusion and Recommendations: This study indicated that first-year students of nursing who received peer support had lower clinical stress levels and better progress in developing psychomotor skills such as measuring the vital signs and dispensing medicines. Due to the importance attributed to patient safety in the modern health system, nursing departments should raise students who can ensure patient care from all relevant aspects including the relevant patient care skills. Therefore, it has been a necessity for nursing instructors to use evidence-based teaching strategies that will reduce students' clinical stress level and support skill development to increase the patients' safety in the clinical environment.

Accordingly, this study can help the authorities amend the relevant curricula considering the facts that peer-assisted learning reduces students' stress and positively affects skill development and that peer-assisted learning can be provided based on the needs of schools to form a more quality and safer learning environment.

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