Int J Edu Sci, 16(1-3): 14-20 (2017)
DOI: 10.31901/24566322.2017/16.1-3.03

Effect of Peer Teaching Used in Nursing Education on the Performance and Competence of Students in Practical Skills Training

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KEYWORDS Nursing Education. Nursing Students. Peer Teaching Model. Skills Training

ABSTRACT Peer teaching is an effective educational approach for nursing students. It has been used in nursing as an adjunct to lectures and to support learning in clinical practice. This study evaluated the efficacy of peer teaching model which is used in skills training of student nurses. As an experimental study, it included 57 first years and 10 senior students from the nursing department. First years constituted the interventional group and the control group while seniors made up the peer educators.This study revealed that the experimental group students had obtained adequate skills in nasopharyngeal aspiration, permanent bladder catheterization practices and take blood pressure compare to their counterparts ($p<0.05$).The approach is helpful for improving students' ability in practical training. The study results add to the literature supporting the use of peer teaching approach in nursing training practical education.

INTRODUCTION

Nursing education is a training which is comprised of theoretical and practical learning and teaching experiences. In order to obtain the desired outcomes in nursing education, theoretical and practical training should be conducted together. Practical training constitutes fifty percent of the whole training in nursing. Occupational skill laboratory settings are the environments where nurses learn psychomotor skills (Mete and Uysal 2010). It helps to reduce students' clinical anxiety, improve their communicative skills and combine theory and practice (Baxter et al. 2009; Morgan 2006).

Psychomotor skill training process should be well-planned in occupational skill laboratories in order for the students to combine theory and practice and get prepared for the clinical circumstance (Tiwari et al. 2005; Unver et al. 2011). Students can think seriously, use problem solving ability, cope with anxiety, rely on themselves and perform their skills instead of learning and performing psychomotor skills mechanically (Bradley et al. 2006; Jeffries et al. 2002).

Peer teaching, an efficient educational approach for nursing students, relies on Bandura's social learning theory, which suppose that learning alone restricts one from observing the attitude of others (El-Sayed 2013; Secomb 2008). This enhances learner's individual-effect of learning (Loke and Chow 2006). Meanwhile, it develops a tutor's behavior and proficiency, while improving their teaching skills (Evans and Cuffe 2009). Used as an educational method, peer education model aims to change attitudes and behaviors in the groups that have social interaction, similar language, behavior and attitudes, and that are at the same level. Recently peer education model is suggested as an alternative to customary educational approaches since it is agreed to have many advantages (Unver et al. 2011). In the studies conducted, it is clear that peer education models that are offered as alternatives to traditional methods are used

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for various age and environments with different purposes (Field et al. 2006; Santee and Garavalia 2006; Jones 2007). In nursing education, particularly in occupational skills education, a teaching approach that can prepare the student for his/her future role and that includes approaches providing learning by doing facilitates learning skills (Hughes 2004). The success of peer education model is closely related to the facts that peers support each other, they express themselves more easily, they perform their skills more easily which they cannot put forward under the supervision of an authority and they have a less stressful learning environment. Thus, peer teaching approach aims to use peer effect positively on behaviors (El-Sayed et al. 2013; Field et al. 2007; Malchodi et al. 2003; Jones 2007). Studies showed that matching first years and senior students help them support each other psychologically, reduce the first years' anxiety and fears at practical training and contribute to senior students' professional and personal development and bring their leadership features out (Wilen 2000).

The peer education model has been applied successfully in the skill training of medical and nursing fields in particular. Within the scope of the peer education project carried out at the Royal Free University Medical Faculty in 2001, third year students implemented the peer education programs to first year students in some selected skills, such as taking stories, and measuring bloodpressure (Howman et al. 2002). In a study conducted by Hamrin and colleagues to assess the educational effectiveness of peer support groups, it was stated that the confidence of the nursing students who received peer support increased positively and that these students showed leadership qualities. In Ladyhewsky's study where the effects of peer mentorship on nursing story taking, physical examination, and clinical problem solving skills were evaluated, one of the major conclusions was that peer mentorship had a positive effect on performance and improved problem solving skills.

In Turkey, limited studies have been conducted on nursing students' peer learning performances in clinical practice (Mete et al 2011; Unver et al. 2011). Mete et al. (2011) stated that first year students revealed that they experienced anxiety while attending to their first patients, having a lack of knowledge, and committing an error; however, they stated that the support of fourth year students was efficient in reducing their anxiety. Ünver (2011), in a study conducted with control group experimental design, applied peer education model on second and third year nursing students for the training of some psychomotor skills and implemented the OSCE exam to the experimental and control groups to evaluate the application. According to the results of the study; OSCE test scores of the students in the experimental group were significantly higher than the control group ($p < 0.05$). Thus, it is stated that the peer education model applied in this study is an effective method in laboratory and clinical skills training. This study was conducted in order to evaluate the effect of peer teaching on occupational skill training performances and qualifications of nursing students in laboratory settings.

The research questions of this study are as follows:

1. Is there a significant difference between the test group (peer education model) and the control group (traditional learning method) students' test scores for tympanic body temperature measurement?
2. Is there a significant difference between the test group (peer education model) and the control group (traditional learning method) students' test scores for taking blood pressure measurement?
3. Is there a significant difference between the test group (peer education model) and the control group (traditional learning method) students' test scores for nasopharyngeal aspiration skills?
4. Is there a significant difference between the test group (peer education model) and the control group (traditional learning method) students' test scores for permanent bladder catheterization skills?
5. Is there a significant difference between the test group (peer education model) and the control group (traditional learning method) students' test scores for oxygen application skills?

MATERIAL AND METHODS

Study Objectives and Population

An interventional study was conducted in order to evaluate the efficacy of peer education model aiming to improve student nurses' laboratory and clinical skills training. The sample consisted of first year and senior students of

School of Health at a great urban university in Bolu, Turkey. The researchers used G*power to calculate power for sample sizes. It was calculated that 57 first year students and 10 final year students would be needed in each group for an effect size of 0.5, with eighty perecnt power at a importance level of 0.05. The total sample consisted of 65 first and final year nursing students.

Study Design

In the design of the study, first years were the occupational skills learners and seniors were peer educators. Among the first years, the ones who repeated or transfer students (from laboratory technician or elderly care staff) were excluded since they had learned occupational skills beforehand. Experimental and control groups were chosen among the first years using random sampling method. Interventional group included 30 students and so did the control group; however, three students from the control group did not participate in the practices and control group ended up with 27 first year students. In this study, the efficiency of peer education model was checked on only five occupational skills that are most frequently used in nursing (taking blood pressure, nasopharyngeal aspiration appliance, permanent bladder catheterization practice, taking body temperature from ear and applying oxygen). Skill proficiency of experimental group was evaluated by peer educators, and control group was evaluated by tutors who participated in the study. It should be noted that the success of peer education is closely related to the number of experienced and sufficient professional educators. For this reason, in this study, peer educators were trained in a well-organized training program designed to improve their teaching skills.

Data Collection Methods

Fourth year senior students took part in the study as peer educators. Ten voluntary senior students who had the qualifications of peer educators according to their academic consultants and tutors were chosen as peer educators. A peer education program was arranged for senior peer educators. In this program, theoretical and practical training was given to the students, explaining what peer education is and how it would be implemented. Also, audio-visual sources were used in order to inform the students about the chosen occupational skills (taking blood pressure, nasopharyngeal aspiration appliance, and permanent bladder catheterization practice, taking body temperature from ear and applying oxygen). In the scope of peer education program, the proficiency levels of peer educators on the chosen skills were detected first and skill training continued until full proficiency was achieved.

Interventional group performed their skills training practice under the guidance of peer educators. Skills training were given in three stages;

1. In the stage of skill gaining, peer educators displayed the skill stages one by one.
2. In the stage of gaining competence in skills, the peer educators (senior student) watched carefully while the participants (first year) performed.
3. In the stage of mastering skills, peer educators observed and evaluated the participant.

Tutors who took part in the training of peer educators were also on ground during practice only as supervisors. Control group students performed their skill training practices under the guidance of their tutors. Their skill proficiencies were evaluated by their tutors.

Data were collected by the researchers themselves in the light of relevant literature, using five skills learning guide and a student identification form. Skills practice performances of the first years (experimental and control group) were assessed via Objective Structured Practical Examination (OSPE). Using objectively structured practical exams which were adapted from OSPE enabled an objective assessment (Sontee and Garavalia 2006). OSPE, an approach used to assess clinical skill performance, is a valid strategy used by students to assess their readiness to apply at the desired level of practice and skills expected of them during clinical practice (Jones et al. 2010; Nulty et al. 2011). Tutors applying OSPE attended neither to peer educators' training nor to control group students' skills training. They did not know whether the students were from the interventional group or the control group. Thus, the efficiency of peer education model was evaluated as a single-blind study.

Ethical Issue

Ethical consent for the study was obtained from a mid-size university located in Turkey Human Research Ethics Committee. Principles of Helsinki Declaration were taken as a basis for the study; participation was on a voluntary basis, students were informed about the subject and "informed consent" were obtained as an

ethical principle. Verbal consents from all participants were obtained after being fully informed about the objectives and procedures of the study. The students volunteering to participate in the study were informed that their private information would not be shared with anyone else (adhering to the privacy policy). The principle of "respect to human dignity" was also taken into consideration.

Data Analysis

For the evaluation of the data, number, percentage, mean and standard deviation methods were used for descriptive statistics. Correlation between categorical variables was assessed by chi-square test. To compare the in group and the control group, considering the number of subjects and distribution of data, parametric and non-parametric tests, Independent-T and Mann-Whitney U were used. The analysis conclusion $p<0.05$ was accepted statistically significant.

RESULTS

The results of the study are discussed in two categories: for peer educators and for interventional and control groups.

Findings on Peer Educators

The average age of the senior students who participated in the study as peer educators was 21.8 ± 0.455. It was found out that all of the peer educators had no information on the subject beforehand. Senior students as peer educators found themselves completely sufficient on just one skill, taking blood pressure (100%) before peer education program. The rates of sufficiency on other skills were forty percent for nasopharyngeal aspiration, sixty percent for permanent bladder catheterization, seventy percent for taking body temperature from ear, and sixty percent for applying oxygen. After the program, peer educators found themselves hundred percent sufficient for all the five skills. Post-test was used to evaluate peer educators. They were assessed using the learning guide prepared for those five skills, only eighty percent of them appropriately performed nasopharyngeal aspiration skill in the first practice while they all performed eighty percent for the remaining skills.

Findings on Experimental and Control Groups

The average age of the interventional group was 19.89 ± 0.480 and control group was 19.02 ± 0.896; the two groups were homogenous in terms of age averages (t: 0.221; p: 0.786). All of the students in experimental and control groups were found to have no previous information on peer education. Students in both the interventional and the control groups were assessed by a learning guide prepared for the five skills (Table 1).

The assessment results on skills of taking blood pressure and body temperature from ear were not found to be statistically significant

Table 1: The assessment of students by learning guides

Skills	*Control group*		*Interventional group*		χ^2	p^*
	n	*%*	*n*	*%*		
Taking blood pressure						
1st practice	24	88.9	28	93.3	0.463	0.49
2nd or more practices	3	11.1	2	6.7		
Taking body temperature from ear						
1st practice	20	74.0	22	73.3	1.960	0.08
2nd or more practices	7	26.0	8	26.6		
Nasopharyngeal aspiration						
1st practice	12	44.4	21	70.0	11.321	**0.02**
2nd or more practices	15	55.5	9	30.0		
Permanent bladder catheterization						
1st practice	14	51.9	25	83.3	14.964	**0.01**
2nd or more practices	13	48.1	5	16.7		
Oxygen application						
1st practice	27	100.0	30	100.0	**	
2nd or more practices	-	-	-	-		

[1]Assessment between the groups were carried out by Chi-square test
[2]The number of subjects in the groups were not enough to provide for testing conditions, so statistical comparison was not possible.

unlike in the experimental and control groups ($p>0.05$). For the skill of nasopharyngeal aspiration, 12 of the control group students (44%) performed the skill in the first practice, 15 of them (55.5 %) succeeded in the second one. Twenty-one of the students in the interventional group (70%) were successful in the first trial, 9 of them (30%) were successful in the second. When the two groups were compared, there was a statistically significant difference ($p<0.05$). As for the permanent bladder catheterization, 14 of the students from the control group (51.9%) were successful in the first practice, 13 of them (48.1%) in the second. Twenty-five of the experimental group students (83.3%) were successful in the first trial, 5 of them (16.7%) were successful in the second. There was a statistically significant difference between the two groups ($p<0.05$).

Interventional and control groups were evaluated according to their skills practice performances, OSPE and exam results (Table 2). OSPE score averages of control group students were found to be lower than experimental group students in taking blood pressure, nasopharyngeal aspiration and permanent bladder catheterization. The difference among the average scores of these three skills was found to be statistically significant ($p<0.05$).

DISCUSSION

Demographical information revealed that peer educators were older than first years. In this study, a peer education model was used in which peer educators were older than learners (Field et al. 2004). Carrying out a peer education project in Faculty of Medicine, Glasgow University; fourth and fifth year students took the role of peer educators in improving clinical skills of the first and second years, Goldsmith et al. (2006) made use of student nurses as peer educators. As shown in these studies, peer educators were older than learner groups that practiced under their guidance, this is parallel to our study.

Peer educators had a training program before they conducted the practices. Before the practice, students self-evaluated themselves as they assumed that they were sufficient in the detected skills (taking blood pressure and body temperature from ear, nasopharyngeal aspiration, oxygen application and permanent bladder catheterization) while they concluded that they were 100 percent sufficient after the training program. The achievement of students practicing under peer guidance was closely related with the sufficiency of peer guides. As a result, while applying such models, the process should be constantly evaluated.

Skills qualifications of interventional group students were assessed by peer educators, control group students were assessed by their tutors using skills learning guides. The percentage of achievement in the first practice on skills of nasopharyngeal aspiration and permanent bladder catheterization for experimental group was statistically important compared to control group ($p<0.05$). These results are parallel to the ones found in the study by Unver et al. (2011) in which he used peer education model in nursing education. The high percentage of success in the first practice can be explained by the fact that peer education model accelerates learning.

The OSPE average scores of interventional and control groups were compared in the skills of taking blood pressure, nasopharyngeal aspiration and permanent bladder catheterization, and it was found out that the difference between average scores of the two groups was statistically significant ($p<0.05$). Goldsmith et al. (2006) studied student views on peer-supported learn-

Table 2: A comparison of OSPE score averages of first grade students

Skills	*OSPE scores*				*Statistical evaluation*	
	Control		*Interventional*			
	X	*SD**	*X*	*SD*	*U*	*p***
Taking blood pressure	76.73	14.315	84.32	10.063	2.012	**0.044**
Taking body temperature from ear	75.54	10.543	80.27	13.538	1.678	0.601
Nasopharyngeal aspiration	73.67	11.863	84.41	7.784	2.85	**0.031**
Permanent bladder catheterization	63.51	14.432	74.5	9.144	2.062	**0.043**
Oxygen application	83.541	9.94	86.49	9.801	0.982	0.774

*SD=standard deviation, **comparison of groups, significance test between the two means (Mann Whitney U)

ing and found that 75.2 percent of the first years stated positive views on the contribution of this model on increasing the basic skills performances. Similarly, it was found that peer teaching was more powerful than classic methods for improving the practical ability of students. The findings of this study supports peer-teaching approach contrary to the conclusions of previous studies (Hughes et al. 2010; Mesler 2009).

CONCLUSION

This study's results add to the literature sustaining the use of peer teaching approach in nursing training. The approach is helpful for boosting students' acquiring of skills with better performance, besides improve their teaching abilities, which are supplemental parts of their future nursing role. For this reason, the study approves the implementation of this teaching model in nursing schools.

RECOMMENDATIONS

The practice of a peer training model in nursing education is beneficial for all students. Therefore, in order to precisely interpret the efficacy of this program, longer and more structured peer-education activities should be carried out. Future studies should focus on peer teaching approach in nursing education with student academic and clinical performance in mind.

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Paper received for publication on July 2016
Paper accepted for publication on December 2016