An investigation into the effect of peer-education on learning catheterization skill among nursing students of Medical Sciences Faculty in 2016-17

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ABSTRACT
Background and aim: An effective innovation in education is peer-assisted learning system which has constructive impacts on different aspects of education particularly in the field of medical sciences. The present study was carried out in order to examine the effect of peer-education on learning catheterization skill among nursing students of Asadabad Medical Sciences Faculty in 2016-17.

Methods: In the present quasi-experimental study, 40 nursing students attending Asadabad Medical Sciences Faculty were selected based on the inclusion criteria and randomly assigned into a control group (n=20) and an experimental group (n=20). Using a researcher-designed checklist as a pretest, the method of catheterization in practice was measured in the two groups. To carry out the intervention, the control group was trained by an instructor (in separate genders) and the experimental group by peers (in separate genders). The peers were selected from among higher-semester students who had obtained the highest scores and were trained about the standards of conducting catheterization by an instructor. One day after the intervention, final evaluation of practical catheterization in the two groups was carried out using the initial checklist. The collected data were analyzed using descriptive statistics and paired samples and independent t-tests through SPSS 16.0. Results: According to the results of the present study, the mean score of total catheterization in the peer group was higher than the group trained by the instructor, and this difference was statistically significant (p<0.05). Moreover, with regard to the subfields of correct technique of catheterization and observance of sterilization hints, the results showed that there was no significant difference between the two groups regarding correct technique of catheterization, while they were significantly different in with regard to observance of sterilization hints, with this emphasis that the students who were trained by the instructor obtained higher scores than those who were trained by peers.

Conclusion: Peer-assisted teaching led to an improvement in catheterization skill among nursing students; therefore, this method is suggested to be utilized to teach clinical skills better.

**Keywords:** peer-assisted teaching, catheterization, students, nursing

1. INTRODUCTION

Clinical education is one of the most important manifestation of teaching and learning in professions related to health sciences, which leads to evolution of knowledge, skill, attitude, and in one word clinical competence of learners (Bagherieh and Khalkhali, 2013). In clinical education, the students are provided with an opportunity to turn their theoretical knowledge into a variety of mental and psychomotor skills that are needed to take care of patients (Lindgren et al., 2005). On the other hand, developing clinical skills among nursing students is an essential part of nursing education program, and providing sufficient opportunity to acquire experience in highly significant in gaining necessary professional competence (Ahmadi et al., 2017; Warne et al., 2010).

One of the effective innovations in the field of education is peer-assisted learning that has constructive effects on different aspects of education particularly in the field of medical sciences. This system is a form of peer-assisted education in which students appear as instructors or instructor assistants that accelerate learning among other students (Mardani Hamuleh et al., 2011). Henning et al define mentorship as supporting, guiding, and helping students learn new skills, adopt new behaviors, and obtain new attitudes (Henning et al., 2008). Peer-assisted teaching and learning have recently gained significance in nursing education although this method is considered an informal approach of learning in clinical activities, which is problematic (Stone et al., 2013; Goldsmith et al., 2006). Among the advantages of peer-assisted learning include deepening learning, gaining higher scores on exams, improving managerial skills, improving communicative skills, making the learning environment more interesting, better transferring the materials among individuals of the same age, reducing the students’ stress while learning and taking exams, reducing the professors’ workload and education of the faculties, and completing the instructors’ activities (Alizadeh et al., 2012; Shields et al., 2015). This method also provides the students with a model to play their roles (Stenberg and Carlson, 2015; Kimyai et al., 2011).

Urinary catheterization is one of the main methods of treating and taking care of patients. Advances in surgical techniques and modern medical equipment have led to complex and prolonged surgeries, resulting in an increase in the number of patients who need urinary catheterization (Gould et al., 2010). This procedure is associated with a variety of complications the most prevalent of which is urinary infection. Urinary tract infections are the most important factors causing hospital infections 80% of which is observed after catheterization (Richards, 2017). Given the prevalence of the mentioned complications, it is highly significant to adopt any kind of measures in order to reduce or prevent bacteriuria (Douglas and Batenhorst, 2017). Among effective measures to prevent urinary infection is the nurses’ performance in placing and preserving urinary catheters, and there is no doubt that observing sterilization hints is also one of the most important effective factors.

Due to the importance of clinical training and also the advantages of peer-assisted teaching mentioned above and given the sensitivity of catheterization procedure particularly among women because of anatomical differences, the present study was aimed
at comparing the effects of peer- and instructor-assisted teaching on learning how to conduct catheterization among the female students attending Asadabad Medical Sciences Faculty.

2. METHODS
The present study was quasi-experimental with pretest and posttest, which focused on comparing the effect of instructor- and peer-assisted education on learning how to conduct catheterization among nursing students. This research has been registered with Code 960294 in the National Strategic Research System. The statistical population included the nursing freshmen who studied in Asadabad Medical Sciences Faculty and had inclusion criteria including being a nursing freshman, taking the lesson of Principles and Techniques, not receiving previous training on how to conduct catheterization, and not being transferred from other medical fields of study to nursing. In order to select the sample, nursing female freshmen in 2 academic periods (2 years) were selected, and through random assignment using Random Allocation Software, 50 students were chosen and were assigned into two 25-member groups by drawing lots.

The data collection instruments included a personal information form (age and average of diploma) and catheterization skill form which consists of 32 items 18 questions related to catheterization technique and 14 questions related to observance of sterilization principles. For each item, a 2-point scale is determined, and the individual gets 1 if the skill is carried out correctly and 0 if wrongly. The whole score of the checklist is 32. The checklist was prepared based on the method of conducting each procedure retrieved from the book Principles and Techniques by Taylor and other reputable domestic and foreign resources. In order to confirm the face and content validity of the catheterization skill scale, the views of 5 faculty members were utilized. After receiving permission from the authorities and the participants, the researchers carried out the pretest (conduction of catheterization skill) in both groups. Afterwards, a group was trained by a peer and the other by an instructor. For the peer-assisted learning group, one of the best sophomores who had obtained a high score on this lesson the year before, had acceptable skill of expression and presentation of materials, and was willing to participate in the study and teach other students was selected. That student was provided with necessary explanations on teaching in clinical skills room, and was then taught about the required procedure and was monitored by one of the instructors in order to check her performance. After her performance was approved to be correct, she was given the opportunity to teach the intervention group students in the practical skill class. The teaching content was the same in both groups and taken from the book Nursing Principles and Techniques by Taylor and other resources. The method of teaching was practical presentation in both groups.

Before the experiment, the instructor and the peer were controlled with regard to equal presentation of the materials. The control group was trained by a instructor in the same way of previous years. During training, the peer and the instructor first explained the method of conducting the procedure to the students who could take note if the wished to. After wards, the students started to carry out and practice the skill in the presence of the peer or the instructor. It is noteworthy that the two groups attended the skills and practice room at the same time. However, the method of presenting the materials and the amount of the students’ participation and the method of communication with them were different in the two groups. The training duration for the two groups was 60 minutes per session. Principles related to observing sterilization hints and the method of wearing sterilized gloves and anatomical difference of urinary tract were taught during the first session. During the second session, the method of conducting catheterization skill was taught. During the third session, the students were provided with an opportunity to rehearse and practice the taught skills. Two weeks after the training, all of the students were given a posttest. In the posttest, the checklist was completed for each student by a nursing principles and techniques instructor who did not know to what group the individuals belonged and had no role in training them in the faculty’s clinical skills room. In so doing, the students first prepared the instruments required in each procedure, then they carried out the procedures on dummies, and special considerations were explained during the procedure if necessary. The duration of completing the checklist for each student was about 15 minutes, and about 20 individuals were trained per day. Data collection took a total of 3 days. Data analysis was carried out using SPSS 16.0. To observe moralities in the study, necessary permission was obtained from the authorities of the faculty and informed consent was retrieved from the students, and in case of failure in learning, the students were provided with supplementary training.

3. RESULTS
According to the results of the present study, the mean score of total catheterization skill was higher among the peer group than the group taught by the instructor, and this difference was statistically significant (p<0.05). Moreover, in the two subfields of correct conduction of catheterization technique and observance of sterilization hints, the results indicated that the two groups were not significant in terms of correct conduction of catheterization technique. Although the two groups were not significantly different with
regard to observing sterilization hints (p<0.01), the students taught by the instructor obtained higher scores than the peer-assisted group.

Table 1 Comparison of the students’ scores on the total skill of catheterization, the subfields of correct technique of catheterization and observance of sterilization hints in the two groups

<table>
<thead>
<tr>
<th>Field</th>
<th>Peer Group</th>
<th>Instructor Group</th>
<th>Independent T</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total skill of catheterization after training</td>
<td>34.72±1.96</td>
<td>36.48±1.9</td>
<td>3.22</td>
<td>.002</td>
</tr>
<tr>
<td>The subfield of correct technique of catheterization after training</td>
<td>27.04±1.51</td>
<td>27.4±1.51</td>
<td>.802</td>
<td>.427</td>
</tr>
</tbody>
</table>

Table 2 Comparison of the scores before and after training in the total skill of catheterization and the subfields of correct technique of catheterization and observance of sterilization hints in the two groups

<table>
<thead>
<tr>
<th>Field</th>
<th>Peer Group</th>
<th>Instructor Group</th>
<th>Independent T</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total skill of catheterization before training</td>
<td>(2)28</td>
<td>(2)29</td>
<td>259</td>
<td>.291</td>
</tr>
<tr>
<td>The subfield of correct technique of catheterization before training</td>
<td>(3)22</td>
<td>(2.5)22</td>
<td>271.5</td>
<td>.415</td>
</tr>
<tr>
<td>The subfield of observance of sterilization hints before training</td>
<td>(1.5)7</td>
<td>(1.5)7</td>
<td>282.5</td>
<td>.537</td>
</tr>
<tr>
<td>The subfield of observance of sterilization hints after training</td>
<td>(1.5)8</td>
<td>(1)9</td>
<td>92</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

4. DISCUSSION

The present study was carried out in order to examine the effect of peer-education on learning catheterization skill among nursing students. According to the obtained results, the mean score of total catheterization in the peer group was higher than the group trained by the instructor, and this difference was statistically significant (p<0.05). In other words, peer-assisted teaching helped the students more to learn clinical skills. Research results have showed that in peer-assisted teaching, the trainer acquires more cognitive skill than the learners. This learning method has positive effect on development of psychomotor field in clinical practices.
Among other advantages of this method of teaching are enhanced practical teaching skills, increased self-confidence among the learners, and improved communicative skills. Playing the role of an instructor by a student leads to the integrated attitude of skill and knowledge in the trainer and the feeling of peace in the learners. In addition, peer-assisted learning leads to creation of the feeling of pleasure, skill, and scientific development among learners who played the role of trainers in a small group. In their qualitative study, Loke et al examined the effect of peer-assisted teaching by students on one another. Analyzing the content of the students’ manuscripts showed that students had both positive and negative experiences, but they had more positive experiences (Loeong and Chow, 2007). Leong et al also introduced peer-assisted teaching as a unique approach to teach hemodialysis topic to pharmacy students (Leong et al., 2012). In agreement with the results of the present study, Dennison says: Benefits of a structured mentoring model are mutually agreed on goals, expectations, responsibilities, and discussion of potential barriers (Dennison, 2010).

In disagreement with the results of the present study, in a similar study carried out in order to examine the effect of peer-assisted teaching on learning practical preclinical repair skills among 34 dentistry student, Kimyai et al (2011) indicated that peer- and instructor-assisted teaching methods had similar effect; with no significant difference between the mean ranks obtained by the two groups (Kimyai et al., 2011). Difference in statistical results can be attributed to difference in the methods. Moreover, difference in the students’ fields of study and also in the skills under study in the two studies can cause such differences.

The results related to the two subfields of correct technique of catheterization and observance of sterilization hints indicated that there was no significant difference between the two groups in terms of correct technique of catheterization, while they were significantly different regarding observance of sterilization hints with this emphasis that the students who were trained by the instructor obtained higher scores than those who were trained by peers. It seems that in instructor-assisted teaching, the emphasis is on sterilization principles and consequently an increase in this subfield among the instructor-assisted students than the peer-assisted ones. In other words, in addition to conducting the whole skill correctly, the instructor pays more attention to observance of sterilization hints, and this difference can be related to factors such as the instructor’s more experience and education than the peer. The results of the study conducted by Blank et al (2013) employing peers along with instructor-assisted teaching of clinical examination helped students obtain higher scores. In order words, teaching by instructor as the core of education is a necessity; however, peer-assisted teaching can be utilized along it (Blank et al., 2013).

Among the limitations of the present study is the small size of the study sample, which restricts the generalizability of the results. It is recommended that similar studies with larger sample size and inclusion of male students for other clinical procedures should be carried out.

5. CONCLUSION
The results of the present study showed that peer-education helped the students more to learn the clinical skill. Peer-assisted teaching with less presence of faculty members is used to teach a large number of students is employed in order to minimize the costs. In the managerial services, since medical and nursing managers are the major designers of medical and nursing measures and care and supervising the quality of such care is their responsibility, by providing students with educational courses and familiarizing them with different teaching methods, they can use senior students to supervise students of earlier semesters. Moreover, this educational method prepares nursing students to better carry out their future responsibilities such as taking care of and teaching patients and other students.

REFERENCE


