



Comparing the Effect of Lecture-Based and Clinical Training on Nurses' Knowledge and Skill in Caring for Patients with Angina Pectoris: A Clinical Trial

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Received 2019 July 01; Accepted 2019 October 05.

Abstract

Background: Patients with angina pectoris need the training to control their disease. This training is mainly provided by nurses; therefore, they must be equipped with up-to-date and sufficient knowledge and skills to be capable of caring for patients.

Objectives: This study aimed at exploring the effect of lecture-based training and clinical training on the knowledge and skill of emergency nurses in caring for patients with angina.

Methods: This randomized clinical trial was carried out between 2018 and 2019 on all nurses working at the emergency ward of three hospitals in Mashhad, Iran. Based on their working hospital, the subjects were randomized into three groups of lecture-based education, clinical training, and control. Using researcher-made questionnaires, nurses' knowledge and skill in caring for patients with angina were assessed and compared before, immediately, and one month after the intervention. Data were analyzed by SPSS V. 22 using Kruskal-Wallis, one-way ANOVA, chi-square, and Friedman tests.

Results: Friedman's test showed a significant difference in nurses' knowledge and skill scores of the two experimental groups at three stages of the study ($P=0.001$), such that these scores were lower before the intervention than immediately and one month after the intervention. Moreover, Kruskal-Wallis test revealed a significant difference between the three groups in terms of knowledge and skill immediately after the intervention ($P=0.001$) and one month after the intervention ($P=0.001$), with the clinical training group scoring highest among the study groups in both of these stages.

Conclusions: The results established that while both lecture-based education and clinical training could enrich nurses' knowledge and skill in caring for patients with angina, clinical training depicts a greater efficacy and durability. Hence, it is suggested that health policy-makers adopt clinical approaches in their attempt to enhance nurses' skills and performance. Furthermore, studies with higher sample sizes are needed to evaluate the effectiveness and sustainability of these two educational methods in nursing.

Keywords: Lecture-Based Education, Clinical Training, Angina Pectoris, Knowledge, Performance, Skill

1. Background

Heart disease is currently the leading cause of death worldwide (1). Although the prevalence of coronary artery disease (CAD) appears to have declined with the development of new diagnostic, preventive, and therapeutic approaches, it remains the leading cause of mortality in developing countries, including Iran (2). Evidence suggests that about 78% of all deaths due to CAD occur in these countries (3). Among ischemic heart diseases, angina pectoris is the most common type that frequently results in ICU hospitalization. Angina is one of the CAD manifestations whose timely treatment can prevent cardiac infar-

tion and death (2). Most risk factors for angina are modifiable through lifestyle changes. In this regard, one of the main contributors to amending one's lifestyle is to integrate educational programs into patient care (4), which is mainly implemented by the nursing team (5).

Some patients with angina are more susceptible to stroke and death, and it is crucial to identify these individuals. Educating patients with angina can reduce health care costs, increase the quality of care, help the patient achieve independence and self-sufficiency, promote patient satisfaction, improve the quality of life, ensure continuity of care, relieve anxiety, and decrease complications (6). Despite its enormous positive impacts, education is not well

addressed in health care centers (7), which may be due to a lack of knowledge and skills in the nursing staff (7, 8). Therefore, considering the importance of education and its role in improving the status of patients with angina, it is suggested that in-service training courses be included in nursing education programs to cultivate nurses' knowledge and skills (9). Therefore, besides making appropriate macro-level planning (10), educational planners should strive to provide conditions to expand the knowledge and skills of nurses in caring for patients with heart problems (11).

Nursing education should be one of the top priorities in the education and health systems (6). In this context, as an integral part of health care, nurses need to have up-to-date knowledge and skills. Evidence has established that education can increase nurses' knowledge and skills and, subsequently, improve the quality of care (12). Given the rapid advances in nursing all over the world and the fact that people working in this field are directly concerned with human lives, it seems that revising and upgrading educational programs, especially using new educational methods, can help empower nursing graduates (13). To be fruitful, this training must be provided most efficiently. They should be planned such that they could raise awareness and promote the skills and practice of human resources. Adopting appropriate approaches in educational planning is essential since all types of desirable teaching and learning methods are directly related to one another (14). Choosing the right training method is one of the most fundamental steps in designing and implementing educational programs (15).

There are various approaches to teaching and making the right choice plays a vital role in the success of an educational program (16). In this regard, lecturing is the simplest, oldest, and most common method of education (1). It is based on discussions and explanations of the instructor and learning takes place by listening and taking notes (16). Despite its benefits such as cost-effectiveness, the presentation of materials in a direct, orderly, and logical manner (17), the ability of the instructor to plan and direct learners toward educational goals, and delivering large amounts of information to many students in a short time (16), lecture-based education entails some disadvantages. Thus, it is a passive teaching method not well suited for instructing practical skills and enhancing mental abilities at high levels; it does not take into account learners' differences, and learners are highly prone to forget previously taught materials (17). In contrast, clinical training is critical in developing professional nursing to the extent that it is called the basis of professional education and is one of the most popular teaching methods (18). Asgari et al. reported the positive effect of bedside teaching on improving the clinical ICU skills of nursing students

(19). Also, Bolordi et al. showed the long-lasting impact of clinical training, compared to lecture-based education, on the performance of pre-hospital emergency personnel in treating patients with suspected acute coronary syndrome (20). Clinical training is a unique opportunity for learners to obtain professional recognition (21), hence facilitating the transfer of knowledge to practical situations. Bedside teaching provides the necessary platform for aligning basic scientific information with practice and acquiring a variety of professional skills. Clinical learning involves practicing necessary skills through observation, designing the right treatment method, and applying it while considering all clinical aspects under the supervision of an experienced and knowledgeable instructor (22). The bedside is the only place that combines theoretical knowledge with clinical practice (23).

2. Objectives

Considering the importance of promoting nurses' knowledge and performance in providing better and optimal nursing care, this study aimed at comparing the effect of lecture-based and clinical training on the knowledge and skill of nurses in caring for patients with angina. The participants included emergency nurses working at three hospitals in Mashhad, Iran.

3. Methods

This randomized single-blind clinical trial was performed between 2018 and 2019 on three groups of nurses working at the emergency of three hospitals in Mashhad, Iran. Sixty nurses were recruited based on a census method. To prevent the dissemination of information, the subjects were assigned to three groups based on their working hospital using simple random sampling. The lecture-based training group consisted of nurses working at Thamen al-A'meh Hospital; the clinical-training group included nurses working at the 550 Hospital, and the control group was formed by nurses working at Imam Hossein Hospital. The number of male and female nurses in the three hospitals was approximately equal. It should be noted that the three hospitals are part of military hospitals in Mashhad and are very similar in terms of the working environment, organizational culture, and other parameters. Furthermore, the statistical analyst was not aware of the group to which any nurse belonged. The inclusion criteria were the willingness to participate in the study, having at least a bachelor's degree in nursing, no previous (theoretical and practical) training about angina pectoris in the last six months, and at least one year of clinical experience in the emergency or CCU. On the other hand, the

exclusion criteria were the unwillingness to continue the study, not attending a test stage, and being absent from the educational sessions for more than two hours (24). One nurse in the lecture-based training group was excluded from the study due to inadequate clinical experience. Another nurse in the clinical-training group was disqualified because of skipping the educational sessions. Thus, a total of 58 nurses were finally studied (Figure 1).

Data collection tools included a demographic questionnaire (age, gender, marital status, level of education, clinical experience, and history of theoretical education and practical training), an 18-item researcher-made questionnaire assessing the nurses' knowledge on angina (scored 0 - 18), and a 24-item checklist appraising nurses' skills in caring for patients with angina (scored 0 - 24). The items were developed by the research team based on the latest version of *Brunner & Suddarth's textbook of medical-surgical nursing* by Smeltzer et al. (25) and *medical-surgical nursing: clinical management for positive outcomes* by Black et al. (26). To confirm their validity, the instruments were presented to 10 relevant faculty members and professors. The test-retest reliability of the knowledge questionnaire was established by Spearman's rank correlation coefficient (0.64). Also, Cronbach's alpha coefficient for this scale was 0.78, indicating appropriate reliability. The inter-rater reliability of the skill appraisal checklist was assessed using Cohen's kappa coefficient. The coefficient of agreement between the raters was 0.75, suggesting a high agreement.

This study was approved by the Ethics Committee of the AJA University of Medical Sciences (IR.AJAUMS.REC.1397.036). After introducing himself to the nurses and explaining the study objectives, the researcher obtained their informed consent. Before the intervention, a pretest was applied to the three groups. The demographic and knowledge questionnaires were completed by the nurses and the researcher filled in the skill appraisal checklist by observing the clinical work of the nurses. In the lecture-based training group, educational materials were presented to two subgroups of 9 and 10 members working in the morning shift. This was accomplished in three sessions (90 minutes each) using PowerPoint slides. At the end of the program, a question-answer session was held to answer nurses' possible questions. In the clinical-training group, the materials were taught practically. Clinical training was conducted by the researcher for five hours (24) in five subgroups (three subgroups of four nurses working in the morning shift and two subgroups of four nurses working in the afternoon shift). In one of the subgroups held in the afternoon shift, one nurse was not present and the session was administered for three nurses. Clinical training, beginning with theoretical materials, was carried out in the conference room of the ward. Then, nurses were instructed on how to work with different

devices (ECG, ECT, and monitoring machines, as well as syringe pumps). Also, training was provided on how to take a patient's history, review the symptoms, follow the nursing process, and take home care at the patient's bedside. Then, every nurse performed the clinical tasks as he/she had been taught. The researcher corrected nurses' mistakes and solved their problems. In the process of clinical training, in addition to the medical and nursing equipment available at the hospital, other educational aids such as books, tablets, and PowerPoint were used to present instructional images and videos. The educational content related to angina pectoris, which was similar for both experimental groups, was prepared by the research team based on the latest version of *Brunner & Suddarth's textbook of medical-surgical nursing* book by Smeltzer et al. (25), *medical-surgical nursing: clinical management for positive outcomes* by Black et al. (26), and the manuals of ECG, ECT, and monitoring machines, as well as syringe pump. The instructor (researcher) was a postgraduate student in Emergency Nursing with 15 years of clinical experience in the emergency ward and teaching educational programs. Nevertheless, the teaching materials were reviewed and approved by the research team before training the participants. The posttest was given immediately after training and again one month after training. The two intervention groups completed the knowledge questionnaire and the researcher completed the skill appraisal checklist during the clinical practice of individual nurses in the ward. The control group did not receive any intervention, yet took the two posttests within a month. To respect research ethics, the educational content was provided to this group at the end of the study.

The data were analyzed by SPSS V. 22 using Spearman's rank correlation coefficient, Kruskal-Wallis, chi-square, and Friedman tests. The significance level of the tests was set at $P < 0.05$. The study procedure is shown in Figure 1.

4. Results

The mean age of the subjects was 35.41 ± 6.12 (24 - 48 years), and the mean of their experience in the emergency ward was 11.41 ± 6.56 years. Most of the participants were married (74.1%), had a Bachelor's degree in Nursing (94.8%), and worked in rotating shifts (79.3%). There was no significant difference between the three groups in terms of age, gender, marital status, level of education, history of emergency experience, work shift, job satisfaction, theoretical education, and clinical training ($P < 0.05$); hence, they were homogeneous in these respects. The results suggested a significant difference between the mean score of nurses' knowledge and skill in the three groups at three stages of the study (before, immediately, and one month

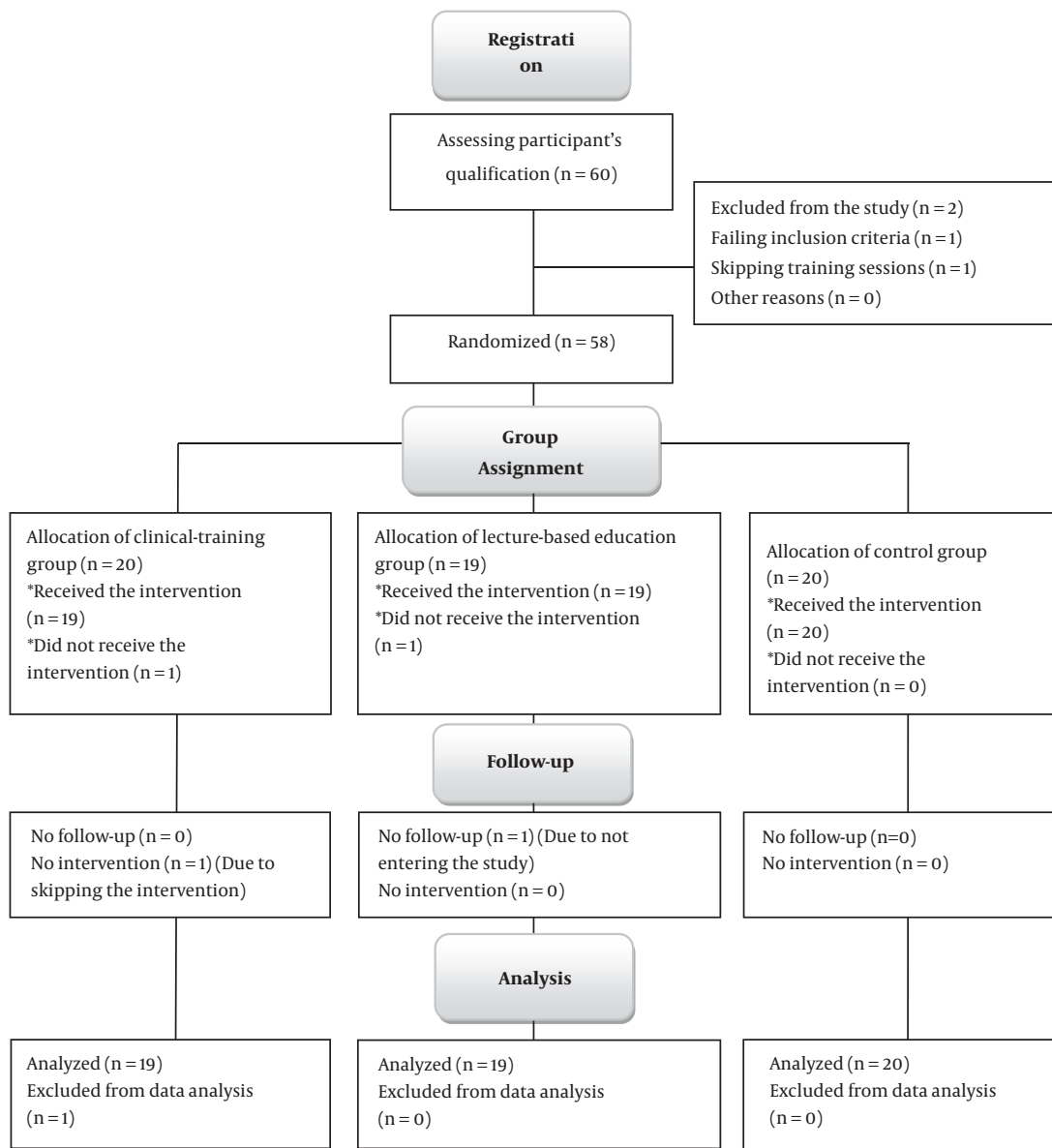


Figure 1. Study procedure

after the intervention). Thus, the scores obtained immediately after the intervention were higher than those in the two other stages (Table 1). Furthermore, while the three groups did not differ significantly in their knowledge score before the intervention, they displayed significant variations immediately and one month after the intervention (Table 2). Similarly, a significant difference was found between nurses' skills before, immediately, and one month after the intervention (Table 3).

5. Discussion

The purpose of this study was to compare the effect of lecture-based education and clinical training on the knowledge and skill of nurses in caring for patients with angina. The results showed that nurses' knowledge and skill scores increased in both experimental groups immediately and one month after the intervention. It could be inferred that lecture-based education and clinical training helped improve the knowledge and skill of both groups,

Table 1. Comparison of Mean Scores of Nurses' Knowledge and Skill Before, Immediately, and One Month After the Intervention in Three Study Groups^a

Group	Lecture-Based Education		Clinical Training		Control	
	Knowledge	Skill	Knowledge	Skill	Knowledge	Skill
Before intervention	1	1	1	1	1.85	2
Immediately after intervention	2.84	2.89	2.50	2.50	2.08	2
One month after intervention	2.16	2.11	2.50	2.50	2.08	2
P value ^b	< 0.001	< 0.001	< 0.001	< 0.001	0.05	-

^aValues are expressed as mean rank.^bFriedman test.**Table 2.** Comparison of Nurses' Knowledge About Caring for Patients with Angina Before, Immediately, and One Month After the Intervention in Three Study Groups^a

Stage/Group	Lecture-Based Education	Clinical Training	Control	P Value ^b
Before intervention	13.26 ± 1.59 (32.71)	12.42 ± 1.02 (22.11)	13.20 ± 0.90 (33.48)	0.05
Immediately after intervention	16.53 ± 0.70 (31)	18 ± 0.00 (48)	13.35 ± 0.99 (10.50)	< 0.001
One month after intervention	15.9 ± 0.96 (30.58)	18 ± 0.00 (48)	13.4 ± 0.99 (10.90)	< 0.001

^aValues are expressed as mean ± SD (mean rank).^bKruskal-Wallis test.**Table 3.** Comparison of Nurses' Skill in Caring for Patients with Angina Before, Immediately, and One Month After Intervention in Three Study Groups

Stage/Group	Lecture-Based Education	Clinical Training	Control	P Value	F
Before intervention	15.21 ± 2.53	13.63 ± 2.03	15.55 ± 1.15	0.009 ^b	5.17
Immediately after intervention	21.84 ± 0.96 (30.50)	24.00 ± 0.00 (48.50)	15.55 ± 1.15 (10.50)	< 0.001 ^c	
One month after intervention	21.00 ± 0.82 (30.00)	24.00 ± 0.00 (49.00)	15.55 ± 1.14 (10.50)	< 0.001 ^c	

^aValues are expressed as mean ± SD (mean rank).^bOne-way ANOVA.^cKruskal-Wallis test.

which is consistent with some other studies discussed in the following.

Kardan Barzoki et al. compared the effect of lecture-based and multimedia training on the knowledge, attitude, and practice of cardiac nurses in caring for patients with a temporary pacemaker. These researchers observed that nurses' knowledge and practice grew better after both types of education (1). Samieerad et al. reported that nurses' knowledge and practice regarding neonatal resuscitation improved after an educational workshop including lecture-based instruction and practical training (14). In their study, Abbas Zadeh et al. confirmed the effectiveness of sustained lecture-based education on nurses' knowledge and practice of documentation (27). Oshvandi et al. explored the effect of pain management training on knowledge, attitude, and pain control methods of recovery nurses. The results suggested a significant difference in the knowledge and practice of nurses regarding pain management before and after lecture-based education. Consequently, the authors supported the positive impact of this kind of education on nurses' knowledge and practice (28). Comparing the impact of e-learning and

lecture-based teaching on the knowledge of nursing students about cardiac dysrhythmias, Sheikh Abu Masoudi and Soltani Molla Yaghobi did not find a statistically significant difference between the mean scores of the two types of education and verified that both approaches enhanced students' awareness (17).

In the present study, knowledge and practice scores in the lecture-based education group decreased slightly one month after the intervention. It could be concluded that the impact of this approach on nurses' knowledge declined over time due to forgetfulness (17). Therefore, it is suggested that lecture-based education be provided at regular intervals, or in conjunction with another method, to instill the materials in learners' long-term memory. Meanwhile, the present study found no remarkable variation in knowledge and practice scores of the clinical training group immediately and one month after the intervention, which may exhibit the more durable effect of this approach to nursing. In this regard, in-service training and updating the knowledge of nurses in all wards, particularly in specialized wards and for those who have graduated a long time ago, must be done clinically and practi-

cally so that learning can be sustained over time.

One of the limitations of this study was that the research team had to categorize nurses based on their working hospital to prevent the dissemination of information among the three groups, which led to a significant difference in the score of nurses' performance in the three groups at the pretest stage. It is suggested that future studies be undertaken with larger sample sizes in other words such as the cardiology ward and ICU to control these limitations.

5.1. Conclusions

Overall, this study demonstrated the long-lasting effects of clinical training compared to lecture-based education. Therefore, we propose that managers, educational planners, and authorities take effective steps to promote the nurses' knowledge and skills by deploying new approaches such as clinical training. It is imperative to prioritize teaching methods that can make learning more sustainable in educational planning.

Acknowledgments

This research is derived from a Master's degree in Emergency Nursing. It was approved and funded by the AJA University of Medical Sciences and registered at the Iranian Registry of Clinical Trials (IRCT2018101015041350N1). The researchers are grateful to the Vice-President for Research of the University, staff of the three involved hospitals, and all nurses who participated in the study.

Footnotes

Clinical Trial Registration Code: The study was registered at the Iranian Registry of Clinical Trials (IRCT2018101015041350N1).

Conflict of Interests: None of the authors has any conflict of interest to declare.

Ethical Approval: IR.AJAUMS.REC.1397.036.

Funding/Support: The AJA University of Medical Sciences funded the study.

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