Original Article Open Access

Design, Implementation and Evaluation of an Operational Program to Improve the Quality of Basic Clinical Skills in Nursing Students in Zanjan University of Medical Sciences in 2017

Zeinab Bahrami Evanaki[1], Saiideh Norouzi [1*], Farhad Ramezanibadr[2], Ali Norouzi[3]

[1] School of Nursing Abhar, Zanjan University of Medical Science, Zanjan, Iran.
[2] School of Nursing and Midwifery, Zanjan University of Medical Science, Zanjan, Iran.
[3] Medical Education Development Center, Zanjan University of Medical Science, Zanjan, Iran.

Article Info

Article history:

Received 24 Jun 2018
Accepted 11 May 2019
Published 22 Sept 2019

Keywords:

Kern's Framework
Clinical Skills
Nursing Students
Kirkpatrick Model

***Corresponding author:**

Saiideh Norouzi, School of Nursing Abhar, Zanjan University of Medical Science, Zanjan, Iran.
Email: norouzi62@zums.ac.ir

Abstract

Background & Objective: Nursing is a practice-oriented profession and one of the main parts of its education is clinical training. Nursing clinical skills will be deteriorated if not used properly. Therefore, this study aimed to design, implement and evaluate an operational program to improve basic clinical skills in BSc nursing students based on the Kern's framework.

Materials and Methods: This study was performed based on the stages of Kern's framework to enhance basic clinical skills in nursing students in Abhar School of Nursing during 2016-2017 using single-group before-after intervention method. To this end, after recognizing the problem of poor clinical skills in nursing students and a primary needs assessment, the operational program and its method of evaluation were performed after being approved in the educational council of the school. During the research, reaction and knowledge of students before the program were compared to after the program based on the first and second stages of the Kirkpatrick model.

Results: In the study, the scores of basic clinical skills test of students and their level of satisfaction significantly increased after the training program. According to the students, their anxiety decreased and their self-confidence increased in the clinical environment after the course.

Conclusion: According to the results of the study, the implementation of the educational program could improve the quality and quantity of clinical education in nursing students. Therefore, it is suggested that this type of program be used by nursing education planners to enhance education quality

Copyright © 2019, This is an original open-access article distributed under the terms of the Creative Commons Attribution-noncommercial 4.0 International License which permit copy and redistribution of the material just in noncommercial usages with proper citation

Introduction

Known as one of the disciplines of medical sciences, nursing has been recognized as practice-oriented in many studies (1). Nursing education contains both theoretical and practical training processes, and nursing students are expected to acquire the necessary knowledge and skills required to perform nursing professional duties after graduation (2). Clinical training is the basis of nursing education, lack of which results in lack of ability to train competent nurses. In fact, no discussion on education of nursing students will be complete without focusing on the clinical field and its features. Any problems in clinical education will reduce the efficiency of this part of education (3). Clinical experience has always been a complementary part of nursing education that prepares students for taking proper measures in the clinic (4). Clinical skills in nursing are acquired gradually and could be forgotten in case of lack of use, in a way that half-life of most clinical skills is only a few months in case of lack of continuous and sufficient practice (5). Students can properly perform their responsibilities and roles at high quality if they achieve clinical skills and are content with their level of competence (6).

Various new methods must be exploited to improve the skills of learners at various stages so that they could learn the necessary skills under the direct supervision of their instructors and receive their

[Downloaded from edujournal.zums.ac.ir on 2026-11-05]

[DOI: 10.29252/edcj.12.34.34]

feedback before providing care to actual patients to ensure lack of damage to patients and not being ashamed of their acts (7). Clinical skills learning centers provide a suitable opportunity for students to improve their clinical and communication skills in a calm and controlled environment before entering the practical environment by using different educational aids and models. In fact, clinical skills learning centers create a link between theoretical content and practical skills (2).

Due to the policies governing the health care systems of countries in the past few years, which mainly emphasize the privacy and human dignity of hospitalized patients, most students cannot implement the nursing procedures on patients in order to attain the necessary skills related to nursing tasks. Therefore, the majority of nearly graduated nursing students believe that they lack the necessary skills and self-confidence to carry out nursing procedures (8). Results of different studies have motivated universities to seek new and efficient methods to teach clinical skills in a way that educational productivity improves in these centers. Result of responding to this necessity has been the establishment of clinical skills centers, where basic clinical skills are taught in the form of behavioral or instrumental skills (24).

Oermann et al. believe that some students are deprived of the opportunity to reach a professional level during the academic year (9). On the other hand, Stayt & Merriman emphasize that irregularities in clinical skill development lead to the training of incompetent nursing students and increased probability of error in procedures (10). Review of the literature revealed that the majority of newly graduated nurses lack the necessary clinical competence to perform nursing duties, the consequences will be prominent in their future careers. It seems that nurses experience a high level of anxiety and stress due to lack of self-efficacy, and the damaging effects of lack of sufficient skills are observed in the practical responsibilities of nurses (11).

Several educational programs and models have been proposed to improve student support in nursing schools and prepare them for work in clinical settings, including internships and apprenticeships supervised by an instructor, preceptorship, mentorship, collaborative model for clinical level determination, feedback practices, and simulated learning environment. All of these methods are primarily used to improve accountability in nursing students after graduation (1). The presence of these educational models is essential to enhance nursing education since according to studies, sense of lack of competence in clinical skills can affect the future career of nursing students and lead to leaving the nursing profession, occupational dissatisfaction, decreased care quality, and increased crimes in newly graduated nurses (12).

One of the major concerns in the nursing educational system of Iran is improving the clinical skills learning programs to make progress in the field of nursing through new, effective strategies. It is assumed that re-training workshops on basic clinical skills can improve the skills of students and increase the quality of educational programs. Given the low level of clinical competency of nursing students after graduation and lack of research on comprehensive evaluation of various factors that could contribute to solving problems in the learning process of nurses in clinical field (1), the present study aimed to design, implement and verify an operational plan for improving the quality of basic clinical skills of BSc nursing students based on Kern's framework so that effective steps could be taken toward the promotion of quality of clinical education for nursing students.

Materials and Methods

In this study, before-after single-group intervention method was performed on 60 nursing students. It is notable that the current research was performed based on the steps of Kern's framework for curriculum development in Abhar School of Nursing affilitated to Zanjan University of Medical Sciences during 2016-2017. The main and specific goals of the model are determining and recognizing problems and assessing the basic needs. In addition, educational strategy, curriculum design and assessment are the stages of the framework.

The opinions of faculty members and educational supervisors in hospitals affiliated to Zanjan University of Medical Sciences determined the lack of sufficient practical skills in nursing students in performing related procedures, mainly caused by short practical exercises of students in clinical skills learning centers and holding few workshops on practical skills in students. In addition, we determined the expected abilities of nursing students in the clinical setting and the necessity of planning to promote clinical skills in these individuals by designing different solutions. It is noteworthy that targeted need assessment was initiated since January 2015. Furthermore, needs assessment was carried out

[Downloaded from edujournal.zums.ac.ir on 2026-11-05]

[DOI: 10.29252/edcj.12.34.34]

by distributing questionnaires among students and using the focus group discussion techniques and electronic sources.

The focused groups included students, clinical instructors, faculty members, educational supervisors of the hospital, and head nurses of wards. The discussions included three sessions on causes of inadequate practical skills, lack of self-efficacy and self-confidence, and high stress level in nursing students in clinical settings. In the end, the opinions of all members were collected and a final conclusion was made. In addition, the questionnaire distributed among the students were collected, followed by data analysis. Eventually, the operational program of improving basic clinical skills of nursing students was approved by the educational council of the school.

The major goal of the current study was designing, implementing and assessing the operational plan to improve the quality of basic clinical skills in BSc nursing students based on the Kern framework. Improving nursing students' self-efficacy in practicing clinical skills in the actual environment, reducing the level of stress and anxiety in nursing students in performing clinical skills in actual clinical settings that are part of the emotional domain of behavioral goals, and improving students' ability to perform procedures such as injections, serum therapy and drug therapy, wound care, catheterization, gastric tube insertion, and airway suction, which was related to the psychomotor domain of behavioral goals, were determined as the specific behavioral goals of the study.

The basic clinical skills promotion program and method of student assessment were approved in a council meeting in the school. In this regard, the curriculum of nursing was assessed for teaching this basic and important course. The related lesson plan was developed with the cooperation of faculty members of the nursing department, the required theoretical and practical topics were determined, and the responsibilities of each faculty member were determined. The lesson plan was developed in collaboration with the nursing faculty members, where the theoretical and practical topics of course units were determined and the responsibilities of each of the faculty members were established. In addition, educational aids and necessary tools were purchased for practice of students at the clinical skills learning center. Practice session schedule was regulated for different student groups by the authorities of clinical skills learning center and issued to the clinical education department and expert of the clinical skills learning center and students. Moreover, the schedule of six educational workshops was regulated in the field of basic clinical skills and notified to students. In addition, five hours of practical exercise to attend the final practical test and internship was obligatory for all students.

To implement the study, five practice sessions (duration=five hours) were held for each student in the presence of one of the nursing faculty members at the end of the practical course of nursing principles and skills as a compulsory session to attend the final examination. Moreover, practical exercise sessions were held in the presence of one of the faculty members before the internship at the beginning of the second semester. It is notable that these sessions were obligatory for students and related license must be obtained to start the internship course.

In addition, in line with promoting the basic practical skills of students, faculty members held workshops on basic clinical skills of nurses (injections, serum therapy, and drug therapy, wound care, catheterization, gastric tube insertion, and airway suction) before the onset of internship of nursing skills and principles. Furthermore, “white coat ceremony” was held in the presence of nursing services managers and training supervisors of the hospitals affiliated to Zanjan University of Medical Sciences in Abhar to familiarize students with hospitals laws and regulations, increase the cooperation field and reduce issues and problems between the school and the hospital. At the end of the course, in addition to the evaluation of the participants’ reaction based on the first level of the Kirkpatrick Model, the practical testing of the trained skills was conducted on the second level of the Kirkpatrick model, followed by comparing the results of before and after the intervention.

Practical tests were also taken by faculty members before and after the intervention to assess the practical skills of students.

A standard checklist was developed for each procedure (based on checklists existing on the acquisition of nursing clinical skills), the result of which included three-section criteria (excellent, satisfactory, needs practice) completed by faculty members. With a total score of 20, practical tests were carried out in the clinical skills learning environment where each student performed nursing procedures on a model. In the next stage, the satisfaction form (checklist) of the program was completed by students before and after the intervention. The checklist included 10 questions

[Downloaded from edujournal.zums.ac.ir on 2026-11-05]

[DOI: 10.29252/edcj.12.34.34]

answered in yes/no format where scores of one and zero were allocated to the items depending on the answer. Reliability of the checklist was determined by test-retest and the Cronbach's alpha coefficient was estimated at 87%. In the end, practical evaluation and satisfaction scores were analyzed before and after implementation using descriptive statistics.

The course was assessed in the educational council of the school before and after implementation, where the opinions of students and faculty members were received and approved and their feedback was informed to the mentioned individuals. The most important strengths and weaknesses of the course included:

1. Improving the basic clinical skills of students due to mandatory training sessions
2. Equipping the clinical skills learning center
3. Having access to books of a checklist of basic clinical methods
4. Increasing students' satisfaction
5. Improving the clinical skills of students in internship
6. Increasing the satisfaction of clinical instructors
7. No time for practice due to intensive theoretical classes (training sessions were held during 12:00-14:00)

Results

The study was performed based on Kern's framework, designed as a comprehensive model to develop a lesson plan specifically to be used for medical education. In general, this comprehensive model improves education and has suitable applicability in research due to proper stages. According to the Kern's framework, the inadequacy of students in performing practical skills, which was the main issue in the present research, was identified, followed by determining the needs in this field after focused group discussions. In addition, the skills that required intervention were determined, such as types of injection, serum therapy, wound care, catheterization, gastric tube insertion, and airway suction. Afterwards, practical classes and workshops were held for students, and the satisfaction of participants and their clinical skills scores were compared before and after the course. At the end of the intervention, focused groups were formed to evaluate the implementation stages and give feedback to faculty members and students. After analysis, the results were indicative of an increase in the mean and standard deviation of score of basic clinical skills in nursing students after the intervention. Table 1 shows the scores of basic clinical skills before and after the intervention. In addition, a significant difference was observed in the level of satisfaction of students before and after the course. In this regard, Table 2 contains the percentage of students' satisfaction with their clinical skills level before and after the educational intervention.

According to the Kirkpatrick four-stage model, in addition to evaluation of participants' reaction based on the first stage of the mentioned model, the scientific test of trained skills was performed based on the second stage of the Kirkpatrick model. After holding a practical test at the end of the course and initiation of internship of students, they reported decreased anxiety level and increased self-confidence and self-efficacy. In addition, the participants experienced less anxiety in performing clinical skills in real clinical settings and identified an improvement in their basic clinical skills after the intervention.

Table 1: Comparison of basic clinical skills scores before and after the process

	Before the process	After the process
Mean and standard deviation	15.06±1.76	17.47±1.41
Minimum score	12	15
Maximum score	19	20

Table 2: Comparison of students' satisfaction before and after the process

	Before the process	After the process
Satisfaction percentage	32%	70%

[Downloaded from edujournal.zums.ac.ir on 2026-11-05]

[DOI: 10.29252/edcj.12.34.34]

Percentage of dissatisfaction	**68%**	**30%**

Discussion

The present study aimed to improve the basic clinical skills in first-semester nursing students studying in Abhar School of Nursing based on the Kern's framework. Given the significant increase in the clinical skills scores of students after the intervention, it seems that the educational program had a positive effect on the basic clinical skills in nursing students. In a research, Shahsavari reported an improvement in basic skills in senior nursing students after holding a three-day re-training program to teach 10 clinical skills (injections, serum therapy, wound care, catheterization, gastric tube insertion, and airway suction), in a way that the students successfully made a transition from the student role to the nurse role (1). In another study, Nash emphasized the necessity of holding re-training courses to improve the professional skills of nursing students (13). Moreover, Bhoi et al. marked that nursing students will never have adequate clinical skills without planning and implementing re-training courses (14). In another research, Everett Thomas et al. reported that application of clinical skills improvement programs, such as short-term re-training courses on basic clinical skills effectively improved the role-playing of nursing students in patient care (15). Watt et al. proposed that three-day re-training courses on basic clinical skills could decrease anxiety and improve self-efficacy in nursing students (16). Our findings are in line with the results of the mentioned studies, showing the considerable impact of the re-training courses on the improvement of basic clinical skills, self-confidence, and self-efficacy in nursing students and decreasing their anxiety level. These re-training courses are held in simulated environments such as clinical skills centers. However, it is noteworthy that while only an educational intervention was performed in the mentioned studies, we carried out the training course after determining and identifying the problems, conducting a basic needs assessment, recognizing the educational needs of students, and designing a suitable program.

According to the results of the present study, there was a considerable increase in students' satisfaction with observing order, method of training, feedback of faculty members and experts, and their own level of basic clinical skills. In other words, implementation of the course led to increased self-confidence and decreased anxiety in performing clinical skills during the internship. Ultimately, the program could be associated with improved quality and quantity of clinical education and students' performance regarding patient care. In 2008, Karabulut and Elsevier conducted a research to evaluate nursing students' viewpoints on basic nursing clinical skills course in a city in Turkey. According to the results, nursing students demanded a higher number of academic clinical trainers and the presence of these trainers in practical training of nursing principles and skills (17).

In another descriptive, analytical research performed to assess solutions to reduce the gap between the theoretical knowledge and clinical performance from the perspective of nursing students in Tabriz, Iran in 2014, selection of students eager to be a nurse and updating nursing instructors by holding workshops to use new educational methods and suitable educational planning were recognized as solutions in this regard (18). In the study, the application of faculty members in training sessions of clinical skills center improved the effective student-instructor relationship and increased the motivation and satisfaction of students. Grobecker et al. showed that senior nursing students experienced a high level of anxiety before entering the workplace and hospital environment, which could be reduced by holding short term re-training courses at the clinical skills learning center (19). Moreover, Higgins et al. marked that the primary source of stress in newly graduated nursing students is lack of clinical self-efficacy in performing nursing duties in the hospital (20). While the simulated environment is not enough to learn clinical skills, it can reduce anxiety in students, reported by Foronda et al. (21).

Another factor affecting the performance of students and nursing graduates is self-efficacy, which can affect the innovative behaviors and determination of individuals to eliminate barriers. Increased self-efficacy in students will improve their self-confidence and decrease their anxiety, which ultimately results in enhanced basic clinical skills. Gobbons et al. proposed that self-efficacy alone can be a compatibility strategy to deal with stress and anxiety (22). On the other hand, Watt et al. reported that self-efficacy can be affected by anxiety (23). Given that the level of anxiety and stress in lower semester students, especially first-semester students and at the time of entering the first undergraduate

[Downloaded from edujournal.zums.ac.ir on 2026-11-05]

[DOI: 10.29252/edcj.12.34.34]

course, is significantly higher than other students, and considering the effect of having sufficient skills in clinical practice in reducing anxiety and stress in nursing students, the study seem to be able to reduce the level of anxiety and stress of students and increase their self-esteem and ultimately improve their performance in internships. It seems that training highly skilled and self-confident students from the very first stages of the course can lead to a more efficient workforce in the future and improve the level of satisfaction with the health system.

One of the major drawbacks of the present study was focusing only on students in Abhar School of Nursing. It is suggested that future studies be performed on students in nursing school of Zanjan.

Conclusion

According to the results of the present research, holding skill practicing sessions and educational workshops in the clinical skills learning center, using faculty members in practice sessions and holding "White Coat Ceremony" to familiarize students with the authorities of the training hospitals enabled nursing students to improve their clinical performance, which ultimately increased their satisfaction and self-efficacy and decreased their anxiety level.

Acknowledgments

Hereby, we extend our gratitude to the vice-chancellor for research and education of the university, head of the Abhar School of Nursing, and students of this university for assisting us in performing the research.

References

1. S Shahsavari H, Ghiyasvandian S, Houser ML, Zakerimoghadam M, Kermanshahi SS, Torabi S. Effect of a clinical skills refresher course on the clinical performance, anxiety and self-efficacy of the final year undergraduate nursing students. Nurs Educ Pract. 2017; 27:151-6.

2. Park S. Effects of an intensive clinical skills course on senior nursing students' self-confidence and clinical competence: A quasi-experimental post-test study. Nurse Educ Today. 2018; 61:182-6.

3. Shahrokhi K. [Barrasiye avamele taneshzaye avalin doreh karamozy]. Proceedings of the 1st conference on midwifery and nursing education, 1995. Iran, Hamadan: Hamadan University of Medicl Science. 20. [Persian]

4. Sharif F, Masoumi S. A qualitative study of nursing student experiences of clinical practice . BMC Nurs. 2006; 4(1): 6.

5. Smeltzer S, Bare B. Brunner and Sudarth: text book of medicalsurgical nursing. 8 ed. Philadelphia, JB Lipincott Co, 1996.

6. Movaghari- Sadat Mahalle M, Soghrati V. Internship nursing students' viewpoints on their clinical skills. Iran J Nurs Res. 2008; 2(7): 45-53. (Persian)

7. Barimnejad L, Azarkerdar A, Hajiamiri P, Rasooly F. [The investigation of the point of view of nursing students in term five and afterward about affective factors on the development of clinical education]. Iranian Journal of Medical Education. 2004; (Suppl 10): 64-65. [Persian]

8. Ozturk, D., Dinc, L. Effect of web-based education on nursing students' urinary catheterization knowledge and skills. Nurs Educ Today.2013; 34: 802–808.

9. Oermann, M.H., Molloy, M.A., Vaughn, J. Use of deliberate practice in teaching in nursing. Nurse Educ. 2015; 35 (4): 535-536.

10. Stayt, L.C., Merriman, C. A descriptive survey investigating pre-registration student nurses' perceptions of clinical skill development in clinical placements. Nurse Educ. 2013; 33 (4):425-430.

11. Joolaee, S., Amiri, S.R.J., Farahani, M.A. Iranian nursing students' preparedness for clinical training: a qualitative study. Nurse Educ. 2015; 35 (10): 13-17.

12. Cantrell, M.A., Browne, A.M. The impact of a nurse externship program on the transition process from graduate to registered nurse: Part II. Qualitative findings. J Nurses Staff Dev. 2005; 21: 249-256.

13. Nash, R., Lemcke, P., Sacre, S. Enhancing transition: an enhanced model of clinical placement for final year nursing students. Nurse Educ. 2009; 29 (1): 48-56.

14. Bhoi S, Thakur N, Verma P, Sawhney C, Vankar S, Agrawal D, Sinha T. Does community emergency care initiative improve the knowledge and skill of healthcare workers and laypersons in basic emergency care in India?. J Emerg Trauma Shock. 2016; 9(1):10.

[Downloaded from edujournal.zums.ac.ir on 2026-11-05]

[DOI: 10.29252/edcj.12.34.34]

15. Everett-Thomas R, Yero-Aguayo M, Valdes B, Valdes G, Shekhter I, Rosen LF, Birnbach DJ. An assessment of CPR skills using simulation: Are first responders prepared to save lives?. Nurse Educ Pract 2016; 19: 58-62.

16. Watt, E., Murphy, M., MacDonald, L., Pascoe, E., Storen, H., Scanlon, A. An evaluation of a structured learning program as a component of the clinical practicum in undergraduate nurse education: a repeated measures analysis. Nurse Educ. 2016; 36: 172-177.

17. Karabulut SD, Ulusoy MF. Students' views on clinical practice of fundamentals of nursing course. Hacettepe University Faculty of Health Sciences Nursing Journal. 2008:26-40.

18. Khodaei A, Mansourian M, Ganjei S, Asgari H. strategies for decreasing gap Between Theory & Clinical Performance from the Viewpoints of Nursing Students in Tabriz University of Medical Sciences. Research in Medical Education.2015; 8(2):49-59.

19. Grobecker, P.A. A sense of belonging and perceived stress among baccalaureate nursing students in clinical placements. Nurse Educ. 2016; 36: 178-183.

20. Higgins, G., Spencer, R.L., Kane, R. A systematic review of the experiences and perceptions of the newly qualified nurse in the United Kingdom. Nurse Educ. 2010; 30: 499-508.

21. Foronda C, Liu S, Bauman EB. Evaluation of simulation in undergraduate nurse education: An integrative review. Clin Simul Nurs. 2013; 9(10): 409-16.

22. Gibbons, C., Dempster, M., Moutray, M. Stress, coping and satisfaction in nursing students. J Adv Nurs. 2011; 67: 621-632.

23. Watt, E., Murphy, M., Pascoe, E., Scanlon, A., Gan, S. An evaluation of a structured learning programme as a component of the clinical practicum in final year bachelor of nursing programme: a pre and post-test analysis. J Clin Nurs. 2011; 20: 2286-2293.

24. razavy SM, salamati p, shahgholi E, et al. the effects of clinical skills learning centers on learning promotion among pediatrics interns iranian. Journal of Medical Education. 2011; 10 (4): 430-438. [persian]

bahrami Z, norouzi S, ramezanibadr F. Design, implementation and evaluation Operational Program for Improving the Quality of Basic Clinical Skills in Nursing and Emergency Medicine Students based on Kern method. J Med Educ Dev. 2019; 12 (34) :34-40

[Downloaded from edujournal.zums.ac.ir on 2026-11-05]

[DOI: 10.29252/edcj.12.34.34]