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Implementation of the integrated educational model on the cognitive and psychological competence in nursing students

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ABSTRACT

Introduction: Since the nurse is the most important member of the medical staff, their cognitive and psychological ability to improve the quality of patient care is essential, so, this study was conducted to determine the effect of integrated educational model on cognitive and psychological competence of nursing students.

Methods: In this quasi-experimental research, the designed educational model is a combination of three methods of group discussion, problem solving, and the use of conceptual maps. In this process, the sampling was done at Imam Khomeini Hospital in Kermanshah in the first half of 2017-2018, and 60 nursing students entered the study. The students' information about nursing care was in burn patients and data were analyzed by IBM SPSS 22.

Results: In this study, the mean age of students was 20.54±14.16 years and most of them (55%) were female students. Pretest and posttest scores in cognitive areas were significantly different (Based on frequency and frequency percent). The other results showed that the level of knowledge and cognitive ability of students after intervention was improved ($p \leq 0.05$).

Conclusion: The present study demonstrates the effect of integrated training on knowledge and skills of nursing students in burn ward, it is suggested this method can be used in these sections as well as conducting other researches on this approach in various nursing settings.

Introduction

The main mission of the universities is to train the human resources needed for the community. The educational system of any profession is the predictive of the ability of its graduates in that profession. In this regard, nursing is of particular importance due to its special status in maintaining and improving the health of the community, so that investigating the nursing education status is considered as one of the requirements of the educational programs (1,2). Nursing education lays the foundation for the effective nursing staffing and it includes both theoretical and clinical education (3). The aim of the clinical education in nursing is to improve the quality of nursing education, provide clinical services, provide a holistic approach in nursing, facilitate learning activities in the clinical settings, and make measurable changes in the students in terms of performing clinical care (4). Clinical education is also crucial in shaping the professional identity of students, so that it is regarded as the heart of the professional education

and forms the basis of the curriculum; the richer the quality of the clinical education is, the higher the quality of nursing education will be (5, 6). In addition, nursing students spend two-thirds of their time practicing clinical work, so linking their work experience with the theoretical learning is of great importance (7). However, despite the importance of clinical education in nursing, the existence of some problems including the low quality of the lecturer's educational method at the clinic, the difficulty of applying theoretical principles in the hospital environment, forcing students to perform the duties of personnel, and lack of proper evaluation of the students by the instructors have reduced the quality of clinical education in nursing students. One of the ways that can increase the quality of clinical education is the use of appropriate educational methods in the clinic; education in the form of active learning significantly improves the correlation between the nursing education and clinical practice (2). Students trained by the traditional methods will continue with the rote memorization of the contents instead of focusing on the understanding of the concepts and their practical application; they will only be the receiver of information presented by the teacher. Such students at the clinic will only be obsessed with the unconscious practice of some habitual works and encounter passively with the new situations, and they would not seek to identify and meet the existing needs through innovation and thinking (4). One of the proposed solutions to eliminate the gap between the nursing education and clinical practice is the problem solving learning. In this learning approach, inductive strategies are used to study the clinical situations or cases, and students are learned to infer the solutions considering the problems. In problem solving learning, clinical problems should be used as a means for students' self-centered learning, and learning occurs through encountering the problems (8). Another active method of teaching is group discussion. Its bases is upon setting some questions by instructor, then the group participates in discussions on how to answer these questions, they discuss them and finally, provide an answer for them; learners will have the same opportunity to discuss the subject matter and give their opinions. Besides the educational dimensions and providing sufficient opportunity to analyze details in discussions, group discussion also has desirable effects on the promotion of the individuals' social culture and communication skills. Group discussion can be implemented in small groups; discussion in a small group allows participants to identify each other and feel belonging to a group, but the most important point in these groups is the participatory learning (9). Since burn unit is one of the most important wards of the nurses' working units, the nurses employed in this center should be highly capable in all fields of nursing; to enhance the ability of nursing students working in the burn units, we decided to use an educational program which leads the nursing students to reach an appropriate learning at the cognitive and psychomotor levels. However, in our review of the literature, we found that studies in the field of clinical education have only focused on the use of one teaching method. In our opinion, clinical education is very complex and associated with much sensitivity. Instead of studying the books in the classroom, nursing students should be trained at the hospitals and learn a lot of contents through communication with patients. Therefore, the use of a single educational method alone is not enough in dealing with such a sensitive issue, and this may lead to the low levels of cognitive and psychomotor competence in students. Clinical education requires the integration of several educational methods so that the students themselves can acquire the skill and knowledge to solve the patient's problems. To this end, we chose an integrated educational program (4-7) to help nursing students achieve proper cognitive and psychomotor competence in the burn units.

Methods

Study type and study purpose

In a quasi-experimental study, the integrated educational model designed in this study is a combination of the three methods of group discussion, problem solving, and the use of conceptual maps. The aim of this program was to improve the cognitive and psychomotor competence of the 6th semester nursing students in the burn units.

Study samples

To this end, 60 nursing students, the research population was all nursing students who were trained in Imam Khomeini Hospital in the first half of 2017-2018, were examined during 3 semesters the students were divided into the 6-8 individual internship groups; the students participated in this internship program have passed the theoretical course of burn in 5th semester. On the first day of the internship, a pre-test was implemented using a researcher-tailored checklist about burn care contents. The validity of the checklist was conducted by content validity approach by consulting experts in fields of burn care and nursing and using related literatures.

Instrument

The tool was taken to assess the students' cognitive competence. The levels of cognitive domain in this checklist include: The first domain of the cognitive level includes: A) patient's awareness level of the types of debridement and the use of any type of debridement; B) students' awareness level of the types of wound dressing and their use; C) students' knowledge about the graft bandage; and D) students' knowledge on the important points regarding the burn wound dressing and infection. The second domain of the cognitive level was related to the students' awareness of the burn medications; this domain totally scored 2 points and included two questions of one point; the questions include: A) students' information level on commonly used drugs (medications) in burn; and B) students' information about the common side effects of drugs used in the burns units. The third domain was associated with the burn concepts; this section had the total score of 2 points and examines the level of students' awareness in 4 domains as follows: A) student awareness of the formula for calculating the percentage of burn with Rule 9; B) student awareness of the way for determining the degree of burns and characteristics of each degree; C) student's knowledge of fluid therapy in burn; and D) the last question in this domain examined the level of student awareness of the types of burns and the problems which are caused by each type. The fourth and the last domain of the cognitive level in this educational process was related to the students' information about the nursing care in burn patients with the total score of 4 points; this section included some questions on the 2 domains of nursing care for the physical problems (3 points) and nursing care for mental problems (1 points); these 2 domains included: A) students' knowledge about the physical care in patients with burns; and B) student information on nursing care for mental support of the patients. In order to assess the level of students' achievement of psychomotor goals, a 14-item checklist was applied (1= poor clinical skills; 2= moderate clinical skills; 3= good clinical skills) to evaluate their psychomotor ability. Content validity was used to determine the validity of this checklist. The instructor, using the observation method in the unit, examined the students' nursing care and their relationship with the patients and completed the checklist based on his observations.

Study method

Then, a 45-minute session was held by the trainer to explain the goals of the internship and how to achieve these goals using an integrated educational program, and an explanation of the problem solving methods, group discussion, and conceptual maps. After that, the students entered the burn unit and each student took the responsibility for the care of a burn patient. First, the students were asked to collect information from the patients using the problem-solving method, then organize the information and determine the nursing diagnoses of the patients and begin to complete their conceptual map at the same time(draw a map of the gathered information at the top and then, write down the potential and actual nursing diagnoses at the bottom, and connect the nursing diagnosis associated with each other by using some lines).Afterwards, they will list different solutions to the patient's problems, choose the best solution, and choose the solution to their conceptual map (attach nursing interventions for each diagnosis). Afterwards, they were asked to list different solutions to the patient's problems, choose the best solution, and transfer the selected solution to their conceptual map (match the nursing interventions associated with each diagnosis). Before the implementation of the selected solution, the students were asked to attend an educational class to exchange their ideas with their team members; each student drew the conceptual map, which was designed by the problem-solving method, and other members of the group examined the conceptual map and the obtained solutions, and noted the weaknesses and strengths of the program. At the end of the discussion, they listed the obtained results and applied some corrections to the conceptual map; then they informed their instructor about the results and in the case of his/her agreement and confirmation, the program could be implemented. During the 2 weeks of attending the burn unit, each student could support 2-3 patients with the integrated program. The nurses of the unit were also asked to transfer the clinical care of these patients to the students under the supervision of their instructors in order to promote the relationship and

trust between the students and patients; in this way, the patients could receive higher quality of care from the students, and the student's self-esteem would also improve. Meanwhile, the observation and question and answer method was applied to evaluate the students' performance; at the end of the second week, the instructor used the post-test checklist to assess the students' cognitive and psychomotor competence.

Statistical analysis

Data were entered into SPSS-22 software and analyzed by descriptive (mean, standard deviation, frequency and frequency percent) and inferential (Wilcoxon test) statistics. The level of significant was considered 0.05.

Results

The average age of the students was 20.54±14.16 years and more than half of them (55%) were female. The results of the present study were evaluated in terms of students' cognitive learning competence through pre-test and post-test. The cognitive domain had the total score of 10 which was divided into 4 categories. The first category was related to the bandaging questions, which were divided into four subcategories and each scored 0.5; the four subcategories are: A) the patient's knowledge about debridement types and the use of any type of debridement; in the pre-test, the students' mean score was 0.14 (17 individuals or 28% of students answered correctly), and in the post-test, the mean score was 0.4 (49 (81%) students answered correctly); B) the students' knowledge about the types of bandaging and the use of each one; in the pre-test, the students' mean score was 0.17 (21 (35%) students answered correctly), and in the post-test, the mean score reached 47.7 (57 (95%) students answered correctly); C) the students' knowledge about bandaging grafts; in the pre-test, the students' mean score was 0.1 (12 (20%) students answered correctly), and in the post-test, the mean score reached 0.39 (47 (78%) students answered correctly); D) the students' information level on the important points of bandaging burning and wound infection; the students mean score in the pre-test was 0.11 (14) (23%) students answered correctly), and the mean score in the post-test was 0.44 (53 (88%) students answered the correct answer); also in other cognitive domains, there was a significant difference between pretest and posttest scores ($P<0.05$) (Tables 1 and 2).

The results obtained from B part

The amount of students' access to psychomotor goals of burn internship are: before the implementation of the integrated program, 25 students (41%) had scored 1 (poor), 24 students (40%) had scored 2 (moderate) and 11 students (19%) had scored 3 (good) in psychomotor skills (Table 3); and after implementation of the integrated program, the obtained scores from checklists were: 6 students (10%) had scored 1 (poor), 16 students (26%) had scored 2 (moderate) and 38 students (63%) had scored 3 (good) which shows a significant difference in the students' psychomotor skills in burn ward (Table 3). According to the results of the pre-test and the students' performance in the ward, at the beginning of each group of students entrance into the burn training, it was revealed that the cognitive and psychomotor skills' level of these students in the burn ward is not at the desired level.

Discussion

Based on the results of this study, it can be said effect of using the integrated educational program (conceptual maps, problem solving and group discussion) on the cognitive and psychomotor competence of the 6th semester nursing students. The findings of the present study showed that the use of

Table 1. Average cognitive competency areas

The scope of questions	Questions	Mean pre test Mean ± SD	Mean post test Mean ± SD	P value
Cognitive	Debridement (0.5 points)	0.14 ± 0.13	0.4 ± 0.103	P=0.0001
Cognitive	Types of dressing and application of each (0.5 points)	0.17 ± 0.13	0.47 ± 0.04	P=0.0001
Cognitive	Gravel Dressing (0.5 score)	0.105 ± 0.109	0.39 ± 0.09	P=0.0002
Cognitive	Burning dressing wound and infections (0.5 scores)	0.11 ±0.14	0.07 ± 0.44	P=0.0001
Cognitive	Common Drugs Used in Burn (1 Score)	0.28 ± 0.27	0.85 ± 0.96	P=0.0001
Cognitive	Common side effects of medications used in burns (1 score)	0.2 ± 0.23	0.73 ± 0.24	P=0.0001
Cognitive	Types of burns and problems that each type (0.5 score)	0.14 ± 0.11	0.49 ± 0.01	P=0.000
Cognitive	Nursing care for physical problems (3 scores)	0.8 ± 0.71	2.55 ± 0.51	P=0.000
Cognitive	Nursing care for mental support from the patient (1 grade)	0.56 ± 0.29	0.96 ± 0.08	P=0.0001

Table 2. Absolute frequency and percent of cognitive competency areas of students

The scope of questions	Question type	Pre-test absolute frequency (Percentage)	Post- test absolute frequency (Percentage)	Question area
Wound dressing	Debridement	17(28)	49(81)	Cognitive
	Types of dressing and application of each	21(35)	57(95)	Cognitive
	Gravel dressing	12(20)	47(78)	Cognitive
	Burning dressing and wound infections	14(23)	53(88)	Cognitive
Medicine	Common medications used in burns	17(28)	51(85)	Cognitive
	Common side effects of medicines used in burns	12(20)	44(73)	Cognitive
Burning concepts	Calculation of burn percentage by law 9	29(48)	60(100)	Cognitive
	Degree of burn and attribute of any degree	32(53)	60(%100)	Cognitive
	Liquid therapy in burn	20(32)	60(%100)	Cognitive
	Types of burns and problems of any kind	17(28)	59(%98)	Cognitive
Nursing care in burn patients	Nursing care for physical problems	16(36)	51(%85)	Cognitive
	Nursing care for mental support from the patient	34(56)	58(%96)	Cognitive
	Nursing care for mental support from the patient	34(56)	58(%96)	Cognitive

integrated educational program could increase the post-test score of students' clinical evaluation in cognitive and psychomotor areas compared to before intervention. Findings of the present study are consistent with the study of Aein and Foruzandeh which examined the effectiveness of conceptual cartography in nursing education process regarding pediatric clinical education. In this qusi-experimental study, 30 nursing students who had passed pediatric nursing apprenticeship course entered the study and were divided into three groups of 10 people. On the first day of internship, after the initial nursing process was presented by the students, the nursing process design method was taught using conceptual cartography. Qualitative assessment of the conceptual maps showed significant progress of students in understanding the nursing process, who improved from the poor level on the first day to the excellent level on the ninth day. According to the findings of the study, conceptual map is a very useful integrating previous knowledge and providing nursing care to the patient based on the nursing process (10). In another study, Mansouri *et al*. examined the effectiveness of education through problem-solving approach on student's academic performance; in this study, the problem-solving method was used to teach the human resources management course of health services management students. The treatment resulted in an increase in the mean score of students from 13 to 16, which indicates the effectiveness of the problem-solving method on student performance (11); this result may confirm the researchers' use of this method. In the study of Asgari *et al*, the effect of teaching the principles of management course through lecture and discussion in small groups on nursing and midwifery students' learning level was compared. In this qusi-experimental study, all non-continues bachelors in the third semester and continues bachelors in the sixth semester of nursing and midwifery in the Gilan University of Medical Sciences who passed the principles of management course during the two consecutive semesters were surveyed with census method (93 subjects). The theoretical issues were presented during eight sessions by two methods of lecture (4 sessions) and group discussion in small groups (4 sessions). The results of the test scores were compared in two teaching methods. The findings of the study showed that the mean score of the group discussion teaching method was significantly higher than the mean of lecture-based teaching method. Regarding the higher mean of student grades in group discussion sessions, it seems that teaching the management course by group discussion method can have more impact on the learning of nursing and midwifery students (12). Also Lake *et al.* made a comparison between two lecture and group discussions teaching methods on 150 physiotherapy students. In this study, 51 people were trained at 4 weekly lectures during three months of fall. During three months of winter, 87 students were taught by group discussion. The scores of midterm and end-of-term tests in the discussion group were higher than that of the lecture group (13). Also, in the present study, an increase in the students' scores was observed at the end of the internship. The findings of the present study are consistent with the majority of the studies (14, 15) regarding the effect of teaching by presenting the conceptual mapping on student learning levels. Yet, in the studies conducted by Ganbary *et al.* and August Brady to examine the effect of different educational approaches on nursing students, the effect of surface learning approach with conceptual map teaching in theoretical lessons was increased in experimental and control groups;

Table 3. Absolute frequency and relative frequency of students psychological competency scope

Motor psychological score	Pre-test absolute frequency (Percentage)	Post-test absolute frequency (Percentage)
Weak (score 1)	25 (41)	6 (10)
Medium (score 2)	24 (40)	16 (26)
Good (score 3)	11 (19)	38 (63)

however, learning increase was higher at higher cognitive levels. The reason for this difference is probably the nature of the lessons taught (16, 17). Rasouli *et al.* in a study named the comparative study of the effect of problem solving and lecture on nursing students' knowledge and performance, concluded that problem-solving method was more effective than lecture method in promoting knowledge and performance; hence, in this way, the instructor manages the discussion process, gives positive feedback and ultimately summarizes that, it looks more effective (18). And Jabari *et al.* in a study showed that education by problem solving and lecture method was able to increase the amount of knowledge of nursing and medical students (19). In a study by Chakraborti *et al*., it was shown that this method promotes learning through understanding the relationship between the concepts of basic sciences and medical knowledge (20). Among the researches consistent with the result of the present study, we can also refer to the study done by Mao, which showed that there was a significant difference between students' knowledge and awareness in favor of the problem-centered group (21). Generally speaking, the use of integrated education is an innovation in nursing students' education; in this method, practical skills are reinforced alongside the theoretical subjects and it motivates students to learn. In this way, students tie in what they learned in classrooms and what they learn during the internship course, and thus the clinical competence of nursing students will be improved. In the traditional method of clinical education, students only do routine works of the ward and have very little interaction with patients, but in this method, the student have responsibility for solving their patients' needs and problems, and with the help of three methods of group discussion, problem solving and conceptual maps, in addition to accurately and scientifically satisfy the needs of the patient, provide good interaction with patients and their classmates. The limitations were related to a lack of appropriate educational facilities such as classroom to discuss about patients problems, and also the shortcomings about time of internships.

Conclusions

The present study demonstrates the effect of compilation training on knowledge and skills of nursing students for caring of burn patients, herewith, it is suggested this approach will be considered in educational settings of burn care and conducted in other clinical wards as research projects.

Ethical disclosure

In this study, tests that threatened the health of individuals were not used.

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Authors' contribution

All the authors have accepted responsibility for the entire content of this submitted manuscript and approved submission.

Conflict of interest

The authors declare that they have no conflict of interest.

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