

Comparison of Lecture and Problem-Based Learning on Learning of Nursing Students

Background: The purposes of this study were to develop a problem-based learning program for nursing student's education and to evaluate the program after its implementation.

Methods: An intervention study carried out on 27 third year undergraduate nursing students in the nursing and midwifery faculty of Kashan University of Medical Sciences. Problem-based learning method was used for one group (n = 13) and the other group were taught with traditional lecture method (n = 14) over 1 semester. In each group there were 8, 2-hour teaching sessions. Finally the two groups passed a same exam. Viewpoints of students in PBL group were also obtained. Chi squared and Mann-Whitney U testes were used in data analysis.

Results: The mean score was 12.76 in problem-based learning and 12.21 in lecture group. However no statistical significant difference was observed in final scores. The mean score of satisfaction was 3.5 ± 0.78 (out of 5) in the PBL group.

Conclusions: This study showed that the problem-based learning had no significant effect on cognitive abilities of these students but on students viewpoints it may improves their communication skills, motivation and interaction abilities.

Keywords: teaching method, lecture, problem-based learning, students viewpoints

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مقایسه مستوی تأثیر اسلوبین فی التعلیم، القول المحاضرہ و الثانی التعلیم المتبحور حول مسئلہ، عند طلاب التمریض

التمهید و الهدف: إن هذه الدراسة صممت بهدف إجراء برنامج تعليمي يتمحور حول المسئلة وتقييم تأثير هذا البرنامج على مستوى التعلیم عند طلاب كلية التمريض.

الاسلوب: اجريت هذه الدراسة على 27 طالب من طلبة السنة الثالثة في كلية التمريض في مدينه كاشان. تم إجراء اسلوب المتبحور حول مسئلة على الفريق الاول المؤلف من 13 طالب و اسلوب المحاضرہ على الفريق الثاني المؤلف من 14 طالب. لقد خضع الفريقين لدوره مؤلفه من 8 جلسات كل جلسة بدمه ساعتين. و بعد ذلك اجري فحص لكل الفريقين. و ايضاً تم تحليل رأي الفريق الاول بنسبه الى الاسلوب المتبحور حول مساله.

تم تحليل المعطيات باستخدام فحص «كاي 2» و «U من ويتني».

النتائج: كان معدل الفريق الاول 12.76 و الثاني 12.21، لكن لمن يكن هناك اختلاف ذو قيمه من حيث المعايير الاحصائية. المعدل العام لمستوى رضا الطلاب نسبة الى المتبحور حول مسئلة كان 3.5 ± 0.78 (من خمسة).

الاستنتاج: تشير هذه الدراسة الى ان اسلوب المتبحور حول مسئلة لم يختلف اختلاف ذو قيمه من حيث الاحصاء. و لكن بنظر الطلاب كان هذا الاسلوب يفضي عليهم قدره اعلى من قبل في المهارات الارتباطيه و التعامل مع الاخرين و الشوق الفائق للاداء العمل.

الكلمات الرئيسية: اسلوب التدریس، المحاضرہ، التعلیم عبر الاسلوب المتبحور حول مسئلة، نظره الطلاب.

نرسنگ طلباء كى تعلیم مین لكچر اور پرابلم بیسڈ تعلیمی روش كا موازنه

بيك گرانڈ: اس تحقيق كا هدف پرابلم بیسڈ تعلیمی روش اور لكچر كے مفید اثرات كا موازنه كرنا ہے۔ یہ موازنه پروگرام لاگو كرنے كے بعد بھی كیا گیا.

روش: اس تحقيق مین كاشان یونیورسٹی آف میڈیکل سائنس مین نرسنگ كے سٹائیس انڈر گریجویٹ طلباء كوشامل كیا گیا جو تیسرے سال مین تھے۔ تیرہ طلباء كے لئے پرابلم بیسڈ روش استعمال كی گئی تھی جبکہ دوسرے گروپ كو لكچر كے ذریعے تعلیم دی گئی تھی۔ یہ تعلیمی روش ایک سمسٹر تك جاری رہی۔ دونوں گروپوں سے ایک ہی طرح كا امتحان لیا گیا اور سب كے نظریات حاصل كئے گئے۔ چی اسكوئرز اور مین وٹنی یو ٹسٹوں كے ذریعے ڈاتا كا تجزیہ كیا گیا۔ پرابلم بیسڈ روش مین بارہ اعشاركہ سات چھبے فیصد تك كامیابی حاصل ہوئی جبکہ لكچر گروپ كی كامیابی كی شرح بارہ اعشاركہ ایک دو فیصد تھی۔

سفارشات: اس تحقيق سے معلوم ہوتا ہے كہ پرابلم بیسڈ روش سے طلباء كی صلاحیتوں پر كوئی خاص اثر نہیں پڑتا ہے البتہ طلباء كی كمیونیکیشن توانائیوں پر اس كا مفید اثر پڑتا ہے۔ یہ روش اسی طرح طلباء كو مہمیز كرنے اور ایک دوسرے سے تعاون كرنے مین بھی مفید ثابت ہوتی ہے۔

كیدی الفاظ: پرابلم بیسڈ تعلیمی روش، لكچر، طلباء كا نقطہ نگاہ

مقایسه تاثیر دو روش تدریس سخنرانی و یادگیری مبتنی بر مساله بر یادگیری دانشجویان پرستاری

زمینه و هدف: مطالعه حاضر با هدف طراحی یک برنامه آموزشی مبتنی بر مسئله و ارزیابی تاثیر اجرای این برنامه بر یادگیری دانشجویان پرستاری انجام شد.

روش: یک مطالعه مداخله ای بر 27 نفر از دانشجویان کارشناسی پرستاری سال سوم در دانشکده پرستاری و مامایی کاشان انجام شد. برای گروه اول (13 نفر) روش حل مسئله، و برای گروه دوم (14 نفر) روش مرسوم سخنرانی اجرا گردید. هر یک از گروه ها طی 8 جلسه 2 ساعته آموزش داده شدند. سپس از دو گروه یک آزمون مشابه به عمل آمد. همچنین نظر دانشجویان گروه حل مسئله درباره کاربرد این روش بررسی شد. آزمونهای کای دو و U من ویتنی برای تجزیه و تحلیل داده ها مورد استفاده قرار گرفت.

یافته ها: میانگین نمرات در گروه حل مسئله 12.76 و در گروه سخنرانی 12.21 بود ولی آزمون آماری این تفاوتها را معنی دار نشان نداد. میانگین کلی رضایت دانشجویان با روش حل مسئله 3.5 ± 0.78 (از پنج) بود.

نتیجه گیری: تحقیق نشان داد که تاثیر تدریس به روش حل مسئله در افزایش یادگیری شناختی دانشجویان از نظر آماری معنی دار نبود ولی از نظر خود دانشجویان، این روش مهارتهای ارتباطی، انگیزه، و توان تعامل با دیگران را بهبود می بخشد.

واژه های کلیدی: روش تدریس، سخنرانی، یادگیری از طریق برخورد با مسئله، دیدگاه دانشجویان

INTRODUCTION

Education is composed of two interrelated processes which are training and learning (1). Teaching and Learning processes include active cooperation and interaction between the instructor and the student. Learning has been defined as changing of the behavior as a result of experience and learning process, creation method, and using the acquired concepts and also discovering, refining and developing scientific concepts by the learner (2).

Creating a background for learning and planning an effective learning environment is one of the responsibilities of the trainers and it is especially of prime importance in teaching nursing, because nurses are expected to check unexpected problems which happen to the patients and solve them by making appropriate and early decisions with the help of other treatment team members (3).

Therefore, nursing trainers should educate their learners in a way that they can use problem-solving skills and manage and solve treatment field problems while taking client-centeredness and revision into consideration (4). This needs developing problem-solving skills in students. These skills lead the learner to autonomy, self-directed decision making, and determining and solving the problems and is based on active information acquire by problem analysis and making an attempt to solve them (5).

Although the advantages of problem-based learning (PBL) have been examined since years ago but there are still further discussions about it and studies have reported various results. Some of the studies such as Carlisle et al. (6) and Stockler et al. (7) have reported that PBL is more effective than traditional method in nursing students. Dochy et al. with studying 43 articles and meta-analysis studies have concluded the PBL has a positive effect on learning skills (8). Neville (9), Wong et al. (10) and Katsuragi (11) studies showed that there is not a great difference between PBL and traditional method. Colliver (12) and Newman (13) in two review studies concluded that PBL did not affect learning basic knowledge and clinical qualifications or had not improved them at least. Some of the studies have shown that exam scores and student learning in traditional method have been further than PBL and there are still not enough evidence prioritizing PBL over traditional method for gaining knowledge (14,15). In Iran because of lack of time or instructor skills, PBL has been used less by nursing trainers. Studies show that most of university instructors are not still familiar with active teaching methodologies and teach with the methodologies with which they have learned themselves. Therefore most of them depend on traditional teaching methods (16, 17), these instructors are usually content-based and prefer a formal learning atmosphere with the least participation of learners. Nursing trainers' dependence on traditional methodologies, induce a kind of schedule based on the necessity of obedience and acceptance to students indirectly and reduces their self-confidence (17,18). Therefore this question still remains that which methodology can be more effective in nursing students' learning. According to these conflicts and the effect of culture and values of the society on thought and learning, this study was done with the purpose of comparing the effect of the two methods of lecturing and

PBL on viewpoints and educational progress of nursing students.

METHODS

This is an intervention study which was done with the confirmation of research committee of nursing and midwifery faculty of Kashan on 27 students who were spending the 6th term of university in 2011. None of the subjects had experienced PBL. Participants were chosen by convenience method and then were divided in to two groups of intervention (13 people) and control (14 people), in this way that on the basis of call roll available in education office, the first person (by heads and tails, and considering heads for intervention group and tails for control group) was put in the first group and the next person in control group. The next people were also divided in to two groups in this way. The dialysis unit from the critical care course of nursing was chosen to be taught. Choosing critical care nursing course, and participation in all class sessions were considered as the including criteria and more than one session absentees was considered as the criterion of getting excluded from the analysis. The researchers had participated in PBL workshops in the previous term and practiced the methodology by teaching 10 learners. In each group there were 8, 2-hour teaching sessions. The first group was taught with traditional lecturing and the second group PBL. In intervention group first in an extra session, the methodology was explained and then teaching was done during 4 2-session periods and each session was 2 hours. In PBL sessions, seats were placed in a way that students could have face-to-face discussions. In this method the teacher (facilitator) expressed a scenario about the learning purposes of that period in the first session, so that students could express the questions and hypotheses with discussions and exchanging ideas and brain storming occurred until material saturation. In case of subject deviation or no taking turns into consideration among the group, the facilitator intervened and led the discussion according to the purposes and subject. All the questions and hypotheses were written on the blackboard by one of the students and questions and hypotheses were replied by individuals and group discussions with reliable reasons and at the end of the class, the topic was pluralized by the facilitator and purposes and learning needs were identified. Then the possible reasons for answering the hypotheses and the remained questions were introduced so that students could prepare themselves for the next session by studying independently. It was announced to students that in case of facing problems in finding resources or guidance, they should refer to facilitator's office in class intervals at assigned hours. In the second session of each period the remained questions and hypotheses from the previous session were discussed and replied by individuals, group discussions, and participants' knowledge gained out of studying. After the identification of all the dimensions of the problem in the framework of purposes and learning needs, that period was finished. In the control group, during 8-2 hour sessions, according to the purposes of the course topics were presented by lecture, PowerPoint, and blackboard. After the end of teaching the two groups, a

similar teacher-made test which was planned by another instructor was taken. For this purpose, after introducing the purposes of the course to another teacher of the same department, he was assigned to plan multiple-choice questions. 20 multiple-choice questions in three levels of knowledge (7 questions), comprehension and application (6 questions) and analysis and assessment (7 questions) were planned and the test was performed for the two groups simultaneously in the same condition. For preventing accidental answers before holding the test, students of the two groups were informed that the test was an experimental one with no negative scores and there was enough time for answering the questions. 1 point was given to correct answers and 0 point was given to wrong answers. In this order the score of the test was between 0 to 20. Content validity of the test was confirmed by 6 faculty members of medical-surgical nursing department of nursing faculty and its reliability was calculated as 84% with the method of Coder-Richardson.

After the test the viewpoints of the participants of the PBL group to this methodology was compared with the lecturing method. For this purpose 11 questions were given to them in the form of an extra questionnaire. The questions included: the effect of PBL in improving communication with others, the effect of PBL and creating a friendly atmosphere among students, helping better comprehension of the concepts, the role of the instructor

in leading the class, the role of PBL on learners' autonomy, the agreement rate of learners in the application of this method in teaching other topics, the rate of practicality according to the facilities, the harmony of presented scenarios with lesson purposes and stress rate during classes. The agreement rate of the students to each one of the above questions was evaluated by Likert scale with 5 choices (including very much=5, much=4, not much=3, little=2, and very little=1). The criterion of satisfaction was 100% agreement with the 11 planned questions. The content validity of this instrument was confirmed by faculty members of medical surgical nursing department and its reliability was achieved by Cranbach Alpha and it was calculated as 0.8. Data was analyzed by SPSS 14 with descriptive statistics and Chi-square and Mann-Whitney U testes.

RESULTS

Out of the whole research participants 67% were females, 81% single, and 73% lived in the dorm and the average age was 21.25. The two groups were not significantly different from the point of average age, total average score, gender, marital status and living place ($P > 0.05$) (table 1). The mean score was 12.76 in PBL group and 12.21 in traditional group but this difference was not statistically significant (table 2).

The total mean of satisfaction and agreement of students with PBL was 3.5 ± 0.78 (table 3).

Table 1: personal characteristics of the research participants

Group	Traditional	PBL	
Demographic characteristics	N (%)	N (%)	P (t-test)
Female	10 (71.4)	8 (61.5)	P>0.05
Single	10 (71.4)	12 (92.3)	
Dorm	11 (78.5)	9 (69.3)	
Average age	21.28	21.23	

Table 2: the comparison of final scores of the held classes with the two methods of traditional and PBL

Group	Number	Score average	SD	P
Traditional	14	12.21	2.77	0.57
PBL	13	12.76	2.2	

Table 3: viewpoints of PBL group students to this methodology

Question	Students agreement percent	Mean of Agreement (5=total agreement)	SD
1. Has it created more motivation in you?	80	4	1
2. Has it improved your communication skills?	81.4	4	0.76
3. Has it made you tired?	32.7	1.62	0.65
4. Has it created a friendly atmosphere?	69.2	3.46	1.4
5. Has it improved your comprehension?	86	4.31	0.85
6. Does the advisor have an important role in this method?	84.6	3.23	1.2
7. Do you agree to learn other courses with PBL as well?	78.4	3.92	0.64
8. I demand to be taught other courses with PBL as well.	69.2	3.46	1
9. How much is the practicality of this method according to the facilities?	64.6	3.23	0.87
10. Were the presented scenarios appropriate?	86	4.31	0.63
11. Were you stressed during the performance of this method?	58.4	2.92	1.6
Total satisfaction of PBL	-	3.5	0.78

DISCUSSION

The average of exam scores of PBL group students was more than the lecture group but a significant difference did not observe between the two groups. This result may be caused because of the low number of the samples, but some studies with larger sample size have also reported similar results (11,12). Rideout et al. in their study compared two groups of nursing students who were trained by PBL and lecture method during 4 years of B.S., and reported that the scores of registration test were not significantly different in the two groups although the PBL group were more independent and satisfied (19). Although a few studies have reported learning improvement with PBL specially in cognitive field but several studies have reported the improvement of other aspects of learning such as developing communication skills, autonomy, motivation development, and increasing remembering the information as advantages of this method (20, 21, 7, 4). Tseng et al. in Taiwan divided 120 nursing students in to two groups and performed PBL in the first group. The results showed that the test group got higher scores in critical thinking and self-directed study, autonomy, reasoning, and communication skills in comparison with the control group (20). In another study, Williams studied autonomy of the students thought by PBL twice with equal intervals with self-direct learning preparation criterion; the two results were approximately average and were not statistically different (21).

In the present study the mean scores of PBL group student agreement with tiredness and stressfulness of the method were 2.92 and 1.62 respectively. This finding seems quite normal because of the novelty of the method for the students. Yuan et al. have also studied two groups of

students from two different faculties. Most of the students reported that the effectiveness of PBL was average and less than 50% reported it as time-consuming and stressful (22). Although using PBL like other novel methods could be unpleasant and stressful to students at first, but the facilitator can improve this condition with appropriate management and support so that students can adapt themselves (16).

In the present study the average of the PBL group students' agreement with if this method has been helpful in better and deeper comprehension of the concepts, was 86%. This result is similar to Chou et al. who reported that PBL improves learning abilities, autonomy, and critical thinking in students (23). In a qualitative study in which all the participants were nursing students who had experienced PBL, it was identified that students found themselves stronger in facing challenges and management roles and expressed their feelings in the form of self-consciousness, critical intellectual, evidence-based care takers (21). Learner's motivation is one of the major and critical factors in the process of learning (1, 24). In Hwang and Kim's study in Korea, nursing students were divided in to two groups of PBL and lecturing and were compared at the end of the term. The motivation and knowledge of students for learning in PBL group was significantly higher than the other group but their point of view toward learning was not much different (25).

Although today the advantages of PBL method cannot be ignored by people in charge of training but according to the large number of students in learning courses and unfamiliarity of nursing instructors with this method, its application is limited and learners suffer from lack of it.

Vahidi et al. have identified obstacles of using PBL as lack of trainers familiar with this method, low level of student skills and knowledge in this method, lack of interactive skills, and its high costs (26).

Research has shown that although the effect of PBL method on increasing exam scores of students has not been statistically significant, but in students' opinion it has had a positive effect on other aspects of learning specially motivation, communication skills, and interaction with others. As the present study has been done just in the case of one course and on trial, its effects on other learning aspects such as critical thinking or evidence-based care was not studied. It is suggested that its application effects on students' function in care taking and especially on evidence-based

care be studied. Also it is recommended to hold educational courses and special workshops to develop instructor skills in the application of this method. Finally it should be noted that the limited number of samples in the present study may affect the results and restricts generalization of them.

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