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ISSN No: 2319-5886

International Journal of Medical Research & Health Sciences, 2016, 5, 8:211-217

Comparison of two methods: TBL-based and lecture-based learning in nursing care of patients with diabetes in nursing students

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ABSTRACT

Learning plays an important role in developing nursing skills and right care-taking. The Present study aims to evaluate two learning methods based on team –based learning and lecture-based learning in learning care-taking of patients with diabetes in nursing students. In this quasi-experimental study, 64 students in term 4 in nursing college of Bukan and Miandoab were included in the study based on knowledge and performance questionnaire including 15 questions based on knowledge and 5 questions based on performance on care-taking in patients with diabetes were used as data collection tool whose reliability was confirmed by cronbach alpha (r=0.83) by the researcher. To compare the mean score of knowledge and performance in each group in pre-test step and post-test step, pair –t test and to compare mean of scores in two groups of control and intervention, the independent t- test was used. There was not significant statistical difference between two groups in pre terms of knowledge and performance score (p=0.784). There was significant difference between the mean of knowledge scores and diabetes performance in the post-test in the team-based learning group and lecture-based learning group (p=0.001). There was significant difference between the mean score of knowledge of diabetes care in pre-test and post-test in base learning groups (p=0.001). In both methods team-based and lecture-based learning approaches resulted in improvement in learning in students, but the rate of learning in the team-based learning approach is greater compared to that of lecture-based learning and it is recommended that this method be used as a higher education method in the education of students.

Keywords: Active Learning, Team-based Learning, Lecture, Nursing Students, Nursing Education

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INTRODUCTION

Learning is the underlying principle of all progress in today's world and it is central to all educational institutions [1]. That any simplistic view about it can lead to loss of all forces, efforts and facilities, but what should be focused on here is that the method of learning has an important effect on the processes of learning activities. Learning plays an important role in developing nursing skills and care [2]. At the moment, all experts are attempting to provide conditions in nursing colleges that result in acquiring nursing expertise [3].

The lecture is the most common method of education in all levels in medical groups [4]. Also lecture is one of the oldest methods of education that is seen in major parts of the educational systems especially in higher education system. This method is teacher-centered and the description and explanation of phenomena and plays an important part in it and it, s main purpose is to transfer knowledge [5]. Among the advantages of the lecture the following can be referred to: being economical, flexibility, strengthening the power of lecture and strengthening students listening skills [6].

In the lecture the teacher more or less speak nonstop in the class, the learners listen to the teacher take notes and then think over teacher's speech. But don't speak with him [7]. Thus, it can be implied that the lecture is not appropriate for all educational objectives [8]. Restricting the ability of students for participation and answering the subjects [9], reduction in the concentration of students over time [10], Reduction in the absorption of the contents, retention and recall [11], restriction in the exchange of information between students and the lecture are among the disadvantages of this method that have caused lecture to be known as one of the least effective methods of presenting information to students [6]. On the other hand, the change made in the methods of responding to information today, have affected the preferred style of students for learning whose reason for this affair is putting the students in the spotlight on the solving the defects of lecture has led to the emergence and advancement of active learning [1]. Active learning strategies play an outstanding role in developing intellectual skills and this is of greater importance, especially in the nursing field that gives importance and focused on critical thinking and the use of theories in clinical status [4]. To ensure active learning, we need creative changes in the educational methods [12]. Therefore, we should search for an appropriate educational model, since if this model is accompanied with suitable educator, can lead to wonderful results [2].

Since the active participation of students is connected with achieving educational objectives [33] active learning approaches can lead to increase in the activity of learners. Change in the professional work and even improvement in the outcomes of health care [13].

Team- based learning is an active learning method designed toward helping students to achieve the objectives of an educational course and how to act in groups [5]. This method can accelerate the change in lecture – based teaching and replace it [14].

Team-based learning can involve students in training discussion more than conventional lecture method [7]. In team-based learning, students first receive the educational content information than in larger class situations, the students are divided into smaller groups and each group is given a problem – solving based scenario to stimulate a debate among students and to exchange information on the given problem and use the presented information to solve the problem using practical exercises [15].

After discussion, they get together to assess and reflect the discussion. Four basic principles should be taken into account in using team-based learning: groups should be formed and managed properly, students should be responsible and accountable for their learning, team-work should expand learning and team cooperation and students should receive immediate and frequent reflection [8].

In the field of nursing, team-based learning increases the workload of the lectures significantly, but lead to reduction in stress and study workload and increase in student's preparedness for the class and this leaves more time for class discussion on complicated issues of nursing [16].

Other advantages of using this strategy include cases such as increase dynamism [3,4], increase engagement in class discussion [2], an increase in the differential diagnosis skills of students, increased daily clinical training experience and reduced economic costs [9]. Given the cases mentioned, present investigation aims to compare two learning

methods that is, team-based learning method and lecture –based learning method of patients care with diabetes in nursing students.

MATERIALS AND METHODS

In this quasi-experimental study third-term nursing students from nursing college of Bukan and Miandoab were included in team-based learning group and third term nursing students from nursing college of Miandoab were included randomly in the lecture-based learning group. Both colleges are located in the western Azarbaijan province and have similar condition and the researcher teaches in both colleges. The study objective was explained to students and participation in the study was voluntary. Before starting the plan, students got familiar with the method, intentions and objectives of team-based and lecture-based learning. Before classes, an exam was given to estimate the knowledge and performance level of nursing students included in the study and a pre-test was given on activities of the diabetes care and was statistically analyzed immediately after pre-test. In team-based learning group, the educational content of diabetic care was given to all students in the form of educational slides and pamphlets in the form a module. Intervention on the students of team-based learning group was conducted in the form of workshop and included following stages:

Stage 1: several days before workshop, students answered the individual readiness confidence test (I-RAT) to assess their understanding of the knowledge and concepts learn in the first stage. Each readiness commitment test consists of 20 items in a variety of formats from educational content of the course. The correct answer to these questions required the use of contents or subjects that the students had to study them in the first stage.

After I-RAT, students were divided into 5 groups of 6 or 7 people in random and the previous exam or test was given to groups. To select the answers of all questions in this stage assessment that is called (G-RAT). The individual in the group must reach an agreement.

Third stage: after collecting individual and group assessment sheets, the group discussed the answers and justified their answer. The lecture also as a facilitator personally participated in the discussion and clarified any unclear concepts. In lecture-based group the educational contents were presented in the form of conventional lectures along with power point to students by the researcher during four 90minute sessions to maintain similar conditions in two groups, all issues related to teaching including emphasis on concepts and key cases, question opportunity, speed and volume of material and time of classes were followed. To assess the results ultimately and after a month, the first test by making changes in order and style of writing questions in the form of scenarios was taken as the post-test in both groups of students. Of course, none of the students in both groups were aware that the questions of the post-test were the same as the question in pre-test. After post-test data were analyzed using Spss software versions 16. Measures on control tendency and dispersion indices were used to present and summarize the data obtained from descriptive statistics. To compare the score of knowledge and performance in each group in the pre-test and post-test stages, paired t-test and to compare the mean of scores in two groups, independent t-test were used.

RESULTS

In team-based learning group, 60.5 percent [23] of subjects were male and 39.5 percent [15] were female. In conventional lecture-based group, 55 percent [11] of subjects were male and 45 percent [9] were female. Chi-square test result did not show significant difference in term of the gender variable between two groups.

In the team-based group, the mean and standard deviation of age and the mean score of the students were (21.50_+2.17, 15.62_+1.46) respectively, and in lecture-based group the mean standard deviation was (21.00_+1.29, 16.75_+1.66) respectively. The result of independent t-test did not reveal significant difference between the age variable of students in two groups but significant difference was observed in the mean score of two groups ($p=0.010$).

Findings indicate that the mean of knowledge total scores and performance of diabetes in pre-test in the team-based learning group was 7.16 with standard deviation of 3.49 (score ranged between 3.67-10.65) and in the conventional lecture-based group 7.40 with standard deviation of 2.45 (score ranged between 4.95-9.85). Independent sample t-test for two groups showed the mean difference of 0.242 in the scores and no significant statistical difference between two groups in the pre-test ($p=0.784$). That is the two groups had the same level of diabetes care learning

before the study. The mean score of diabetes knowledge in the pre-test in the team-based learning group was 4.42 with standard deviation of 2.37 and in the lecture-based group 5.30 with standard deviation 1.86.

Independent sample t-test for two groups showed the mean difference of 0.879 in the scores and no significant difference between two groups in pre-test (p=0.157). That is the two groups had the same level of diabetes care learning before the study.

The mean score of diabetes performance in pre-test in team-based group was 2.74 and standard deviation of 1.41 and in lecture-based group was 2.10 and standard deviation of 1.07. Independent t-test for the groups, the mean difference of 0.637 in the scores indicates the no significant statistical difference between two groups in the pre-test (p=0.086). That is both groups had the same diabetes care level prior to study.

The mean of total knowledge and performance scores of diabetes in the post-test in team-based group was 14.61 and standard deviation of 2.51 (score ranged from 12.10 to 17.12) and in the lecture-based group 10.35 with standard deviation with standard deviation 2.79 (scores ranged from 7.56 to 13.14). Independent t-test for group is indicative of mean difference 4.255 and significant statistical difference in the post –test of the two group (p=0.001), meaning that team-based learning led to more improvement in the level of diabetes care learning compared to lecture-based group.

The mean score of diabetes knowledge in the post-test in the team-based learning group 10.45 with standard deviation of 2.06 and in the lecture-based group 6.40 with standard deviation of 2.56. In the independent sample t-test for two groups, the mean difference showed significant statistical difference in the post-test of both groups (p=0.001).

The mean score of diabetes performance in the post-test in the team-based group was 4.16 with standard deviation of 1.05 and in the lecture-based group 3.50 with standard deviation of 1.05. Independent t-test for two groups showed the mean difference of 0.658 and significant statistical difference in the post-test in two groups (p=0.028).

The mean score of diabetes knowledge and care performance in the team-based learning group was 7.16_+3.49 in the pre-test rose to 14.61_+2.51 after intervention that the difference of 7.447_+3.046 between these two scores in the paired t-test indicated significant statistical difference in the scores before and after intervention in this group (p=0.001). This result means that the learning in the use of team-based learning leads to high improvement in the learning in students of the intervention group compared to pre-test.

The mean score of diabetes care knowledge in the team-based group that was 4.42_+2.37 prior to intervention rose to 10.45_+2.06 after intervention that the difference between these two scores in the paired t-test showed significant statistical difference in the score of this group before and after intervention (p=0.001). This means that the application of team-based learning has highly led to improvement in learning diabetes knowledge in the nursing students in the intervention group compared to pre-test.

The mean score of diabetes care performance in the team-based learning group that was 2.74_+1.42 prior to intervention rose to 4.16_+1.05 after intervention that the difference between these two scores indicates the significant statistical difference in this group before and after intervention (p=0.001). This means that the use of team-based learning method has led to high improvement in the learning performance of students in the intervention group compared to pre-test.

The mean score of knowledge and diabetes care learning performance that was 7.40_+2.45 I lecture-based group prior to intervention rose to 10.35_+2.79 after intervention and the difference 2.95_+1.791 between these two scores in the paired t-test was indicative of significant statistical difference between the scores before and after intervention (p=0.001).

This means that education in lecture form has resulted in improvement in learning in students in lecture-based group compared to pre-test. The mean score of diabetes care knowledge in lecture –based learning group that was 5.30_+1.86 prior to intervention rose to 6.40_+2.56 after intervention that the difference between these two scores in pairs t-test indicative of significant statistical difference in the scores of this group prior to intervention and after

it(p=0.001). This means that the use of lecture-based learning method has resulted in improvement in learning in nursing students compared to pre-test.

The mean score of diabetes care performance in the lecture-based learning group that was 2.10_+1.07 prior to intervention rose to 3.50_+1.05 after intervention and the difference between these two scores (1.40_+1.314) in the paired t-test is indicative of significant statistical difference in the scores of this group before and after intervention (p=0.001). This means that the use of lecture-based method has led to improvement in the learning performance of students in lecture-based group compared to pre-test.

The mean of total knowledge and performance scores of diabetes care in team-based learning group during the intervention and in IRAT stage was 99.1_+63.10 that rose to 15.79_+1.94 during GRAT stage and difference between these two scores (5.158_+2.488) in pairs t-test indicates of significant statistical difference (p=0.001). This means that the students in this group had better performance in the group stage compared to individual performance.

The mean of diabetes care knowledge in the team-based learning group during the intervention and IRAT stage that was 68.1_+3.7 rose to 11.11_+2.03 during GRAT stage and the difference 4.79_+2.487 between these two scores in pairs t-test shows significant difference (p=0.001). This means that the students in this group acquired more knowledge in the group stage compared to individual stage.

The mean of diabetes care performance scores in the team-based learning group during the intervention and in IRAT stage that was 91.0_+61.3, rose to 4.53_+0.76 and the difference 0.921++1.1 between these two scores in the paired t-test indicates of significant difference (p=0.001). This means that students in this group had better learning performance in the group stage compared to individual stage.

Table1. Comparison of the Mean and SD of knowledge and performance of diabetes care before and after training in Team-base and lecture-based learning groups

		Lecture-based learning group		Team-based learning group		P-value
		Mean	SD	Mean	SD	
Knowledge	Before intervention	5.30	1.86	4.42	2.37	0/157
	After intervention	6.40	2.56	10.45	2.06	<0.001
Performance	Before intervention	2.10	1.07	2.74	1.42	0.086
	After intervention	3.50	1.05	4.16	1.05	0.028
Total of knowledge and performance	Before intervention	7.40	2.45	7.16	3.49	0.784
	After intervention	10.35	2.79	14.61	2.51	<0.001

DISCUSSION

The mean score in two groups in the pre-test was not significantly different that is indicative of the same level of knowledge and performance in both groups of students before intervention. After intervention significant statistical difference was observed in the mean score of the two groups and both groups was studied in all aspects, both in post-test stage and in stages of the study and the result showed that team-based learning led to better and more effective learning compared to lecture-based group. That this is consistent with the study of Vasan and colleagues [11] in term of high acquired scores in the active learning –based group compared to lecture-based group. These findings also are consistent with the finding of study by Rajabi [17] , Rich [18], Letassy [12], Hemati [19] but is consistent with the findings of the study by Haidet [20], karimi [21], Fesharaki [22] and colleagues in that they don't show significant difference in terms of active learning approach and lecture-based approach.

This disparity can be due to the difference in the administration of active learning method and heterogeneity of learners under study. Comparison within team-based learning group showed that the mean of scores in the post-test had increased significantly compared to pre-test in a way that the class mean on the collective knowledge and performance rose from 7.16 to 14.61 and similarly comparison of pre-test and post-test scores within lecture-based group were significantly different. Of course the rate of increase in the team-based group was more evident that was consistent with the findings of Pileggi [13]. His findings are indicative of significant statistical increase in comparing pre-test and post-test in active learning approach. These findings also are consistent with the findings of Hemati [19] and Hasanpour dehkordi [23] but consist with the study of Heidari [24], Fesharaki [22] and colleagues that they are not significantly different in terms of comparing pre-test and post-test scores.

This disparity can be due to the low number of samples under study [44] that can affect the findings of the study. Finding showed that the mean score of students in active learning approach group in the group test (15.79) was significantly higher than of individual test (10.63). That is consistent with the finding of Pileggi [13]. Finding of study by Galand [25], Hemati [19] and Hasanpour dehkordi [23] confirm these results too, but are not consistent with the study conducted by Fesharaki [22], Heidari [24].

CONCLUSION

The result of this study showed that methods of learning, that is team-based learning and lecture-based learning have resulted in improvement in the students, but the use of team-based learning method led to more improvement in the diabetes care learning level compared to lecture-based learning method. On the other hand the application of team-based learning method has highly led to improvement in the knowledge and performance of the students and it is recommended that this method be used as a higher educational method in educating students.

Acknowledgment
This study is the result of the thesis approved by the medical university of Hamadan. We deeply thank the deputy manager of the university and all individuals who participated and cooperated in the study.

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