

Effect of Team-Based Learning on Study Habits of Nursing Students

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Received: 6 June 2017

Accepted: 5 July 2017

Background: The effect of new teaching method on study skill of students results in a significant improvement in learning performances. The aim of study was to determine the effect of Team-Based Learning on study habits of nursing students.

Methods: The quasi-experimental study with a before-and-after design was conducted on nursing students of Golestan University of Medical Sciences in 2015. 101 students participated in this study through census sampling considering the inclusion criteria. The data was collected using Palsane and Sharma Study Habits Inventory (PSSHI) before and after intervention. The intervention was 16 sessions (a two-hour session per week) Team-based learning. The data was analyzed in SPSS-20 software using paired t-test.

Results: Finding showed that most of the students were female (60.3%), and single (95%) with mean age of 21.47 ± 1.5 years. When students were stratified into four groups based on the quartiles of the distribution of study habit, the number of students who had poor study habit decrease after intervention (%5.6) and the number of students with excellent study habit increase after intervention (%3.8). In addition, the mean and standard deviation scores of students' study habits of before and after the intervention were 42.53 ± 7.46 and 48.75 ± 8.94 , respectively, which was significantly different ($P < .005$).

Conclusion: The results showed that Team-Based learning improved their study habits, but the majority of students had poor study habits. In order to improve the study habits of students, student-centered learning is recommended.

Keywords: Team-Based Learning, Education, Study Habits, Nursing Students

Introduction

The evidence shows the importance of active learning approach in compared to traditional method. Active learning approaches is a student-centered learning method that can improve the students' social and study skills more than teacher-centered method because of its active role in the learning process and teamwork (1-3).

Team-Based learning (TBL) is one of the active learning approaches, which is used to improve the study method and permanent learning (4). The aim of student-centered learning is to improve the student learning quality by increasing the problem-solving skills, ensuring the presence of the student in the class with an advance preparation, and creating energetic class atmosphere. TBL was introduced by Larry K. Michaelsen (1990) for the first time. This method aims to increase the learning at higher cognitive levels using individual knowledge under team working (6). In this approach, by discussing and spending time on identifying the issue and discovering the related topics (during or after sessions), students can apply the gained knowledge in hypothetical clinical, situation, which results in deep learning [7]. Group activity leads to an increase in the study skills of students by sharing and combining the information and results in learning at higher cognitive levels (8-10). In TBL method, student should have information about the content in question; in fact, the purpose of practical tests at the beginning of the team-based learning session is to improve the Student-centered learning (5).

The study showed that students trained in new approaches not only learn the skills deeply but also their job performance will be affected better compared to traditional training. Among the skills, one can name interpersonal communication skills, creative and critical thinking, decision-making, reasoning, self-assessment, time management, use of multiple information resources, ability to collaborate effectively with the group and improvement of study habits (2, 9, 11-14). After graduation, by improving these skills, self-directed learning is provided to help students gain the new needed information on their own. Due to a large amount of educational content of medical students in university (15) and an increase of new medical information, memorizing medical information along with learning clinical skills is difficult (16). Therefore, effective learning requires spending enough time, having regular curriculum and study skills. When the learners face with different learning tasks, they use specific methods. Hence, it is possible to

improve their study styles with educational intervention using new training techniques (17, 18). Since the study is a complex action and no method alone can respond to all situations (17), failure to choose the correct study method confuses most students and results in a loss of energy and time (18). Research shows that only 51-61% of useful study habits are employed by students, which among them one can name reading skill, taking notes, summarizing, managing time, and paying attention to health. This is due to the lack of students' information about Learning and Study Strategies and the use of their own specific methods (19). As a result, choosing the best educational approaches to improve the study habits of students is of central importance (20), because by improving the study habits of the student, their academic performance is also improved (17). In order to achieve the best study habits, it should be investigated in different studies and training approaches.

Limited learning programs have introduced learning-teaching methods in their main curriculum. However, lecturers should evaluate the existing teaching methods and determine the effective alternatives to develop the knowledge and skills of students. Since the effect of TBL on study habits have been less interested in other studies.

methods

This quasi-experimental study with a before-and-after design was conducted on 120 nursing students, after obtaining the approval from the institutional ethical committee of Golestan University of Medical Sciences, 2015. All undergraduate nursing students of semester 5-6 of a four year health sciences curriculum was consider as potential. 101 students were selected through purposive sampling considering inclusion criteria. The inclusion criteria were had no experiences of TBL and other active learning methods, no history of formal training or participating in study skill workshop which influence on study strategy and habits; and choosing both mental health nursing 1 and 2 for the first time consecutively. The exclusion criteria were didn't like to continuation partnership to this research and lack of participation two sessions continuous or four sessions interrupted in each semester. The eligible students fulfill the written informed consent. They were assured about confidentiality of private information and their voluntary for participation. In order to observe ethical considerations, we first obtained the agreement of University's Ethics

Committee. Then, the purpose of the research and commitment to the confidentiality of the information and maintaining the anonymity of the participants were assured and informed consent was obtained from the participants.

Data was collected twice, a week before intervention (at the beginning of the fifth semester) and 2 weeks after intervention (at the end of the sixth semester), using the questionnaire consisting two parts; the first part includes demographic characteristics and the second part includes Palsane and Sharma Study Habits Inventory (PSSHI).

The intervention comprised a 16-session Team-Based Learning. TBL program was applied a two-hour sessions per week in eight weeks, other topics had already been covered in lecture sessions. A Team-Based Learning applied during 2 semesters consecutively. During the period of this study two teachers responsible for running and teaching on the program. The students were divided into smaller teams of 6-8 in each with varying diversities, background and abilities (based on gender, and mean score of latest semester). Team membership remained constant for the entire module. All students in different groups took the same assessments at the same time. At the beginning, the course syllabus, which consisted of the course objectives, reading assignments, in-class activities, and course evaluations, was presented to students before beginning the course. a briefing session was held to introduce the TBL approach and to meet the students with their individual and group tasks. To ease the communication during group activities, the seats were arranged in a circular form.

Advanced preparation was the first step of TBL which students prepared for the session on the topic and material which was provided to them by the instructor. For that reason all students were informed of the topics, and associated reading materials one week in advance. In advance, the topic of each session was determined in the course plan and students should study them individually based on the suggested references. In each session, the TBL steps were as follows:

- Assigned readings: Prior to the beginning of each session, students were given a reading assignment that was to be completed outside of class.

- Individual Readiness Assurance Test (IRAT): For assuring students' Readiness, the instructor administered a test consisting of challenging multiple choice questions (MCQs) initially to each student on the key concepts in various cognitive level (level of knowledge,

understanding, apply, analysis, combination and evaluation)

- Group Readiness Assessment Test (GRAT): The GRAT was performed on groups, immediately after IRAT. In this test, the member of each group chose the correct answer regarding their justification of answer after discussing in the group. In these two steps, students could not use references.

Readiness tests in each session were quite similar for all groups and the questions of IRAT and GRAT were similar.

- Appeal Form: The answers keys were given by lecturers immediately after GRAT (both individual score and group performance). The students were encouraged to appeal any questions. This open-book process helped students to review of the readings and justify that their answer should be considered "correct" rather than wrong based on references.

- Group assignments: In this open-book step, a clinical scenario was presented to students. The group members had to answer the questions using their basic knowledge. Instructor then clarified any questions or issues from the readings or test.

- Peer evaluation: Finally, students were evaluated by rest of the team members for their readiness, participation, respect to other team members, and flexibility.

At the end the instructors outlined the whole topic in brief and answered any remaining questions and ambiguities.

For evaluating students their activities in all components of TBL process included in the course grading system based on following formula:

For evaluating students their activities in all components of TBL process was calculated by following formula (21, 22).

The questionnaire consisting two parts; the first part includes demographic characteristics (including gender, age, birth rank, and the mean of last term score) and the second part includes Palsane and Sharma Study Habits Inventory (PSSHI). This inventory was developed by Palsane & Sharma (2003) and contains 45 items and eight dimensions including; budgeting time (5 items), physical conditions for study (6 items), reading ability (8 items), taking notes (2 items), factors in learning motivation (6 items), memory (4 items), taking examinations (10 items) and health (3 items). The procedure of scoring is quite simple. For 'Always' or 'Mostly' response, score of 2 is awarded, whereas 1 and 0 scores are to be given for 'Sometimes' and 'Never' response respectively. In case of statement Nos. 6, 9, 13,

15, 24, 26, 34, 36, 37, 41 and 42 the weightage of scoring is reversed and it is as 0, 1 and 2 for 'always', 'sometimes' and 'never' responses respectively. The maximum obtainable score is 90. Higher score indicates good study habits. The validity and reliability of the inventory is determined by Iranian researcher. The results indicate that the inventory has sufficiently high validity with other similar inventories and have significant relationship with other variables which

influence the study habits and academic performances. The criterion validity is reported 0.74. The reliability coefficient was found to be 0.88 by test re-test method (with an interval of 4 weeks) on a sample of 200 on was found to be 0.56 between odd and even item (17, 18).

Data were analyzed in SPSS-16 software using paired t-test and Cochran test. The significance level was considered 0.05.

Calculation of Overall Course Grade

$B = (b_1 + b_2) \times b_3$ $D = A + B$ E= Mean of Final Scores Earned in all Session	A: Individual Readiness Tests Score b ₁ : Group Readiness Tests Score b ₂ : Group assignments Score b ₃ : Peer Evaluation Percentage B: Adjusted Group Activities Score D: Final Score Earned each Session E: Total Points Earned in Course
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Results

The mean age of students was 21.47 ± 1.5 and most of the participants were female (60.3%) and single (95%)(Table 1).

Frequency distribution of study habits of students in terms of percentile showed that only 20.9% of students had excellent study habits and 24 students had poor study habits. The number of students with poor study habits was reduced after intervention (24.2% against 18.6%) and the number of students with excellent study habits was increased after intervention (20.9% against 24.7%) that the difference was statistically

significant ($P=0.04$) (Table 2). In addition, the mean and standard deviation of students' study habits before and after intervention were 48.75 ± 8.94 and 42.53 ± 7.46 , respectively, The mean score of students after ending of the TBL module was significantly more ($P=0.0001$) as compared to before intervention (Table 2). The average score of seven dimensions of students' study habits was significantly increased ($P<0.005$) and only in memory dimension, no significant difference was observed (Table 3).

Table 1: Demographic information of participants

variable		Number	percentage
Gender	Female	61	60.3
	male	40	39.7
marital status	Single	96	95
	Married	4	4.1
	No answer	1	0.8

Table 2: frequency and valid percent of study habits scores of students before and after intervention

Time of measure Frequency of study habits scores	Before		after		P-value
	Number	Valid percent	Number	Valid percent	
Poor (less than %25)	24	24.2	19	18.6	0.04
Moderate (25-50%)	29	28.6	35	35.1	
Good (50-75)	27	26.4	22	21.6	
excellent (higher than %75)	21	20.9	25	24.7	
Total	101	100	101	100	

Table 3: mean and SD of study habits dimensions' scor before and after intervention

dimensions of study habits	Before		After		t	P-value
	Mean	SD	Mean	SD		
Budgeting time	4.20	1.81	5.43	2.00	4.58	0.0001
Physical conditions for study	5.96	2.00	6.62	2.02	2,84	0.005
Reading ability	7.21	1.93	8.46	2.14	4.75	0.0001
Taking note	2.07	1.56	2.83	1.84	4.17	0.0001
Learning motivation	7.01	1.87	8.18	1.89	5.20	0.0001
Memory	4.04	1.08	4.15	1.26	0.70	0.48
Taking examination	8.65	1.77	9.50	1.94	3.66	0.0001
Health	2.61	1.25	3.18	1.34	3.38	0.0001
Total score	42.53	7.46	48.75	8.94	7.56	0.0001

Discussion

The findings showed that before participating in TBL training, about half of the students had moderate or poor study habits. Few of the students had excellent study habits that were consistent with the results of some studies in different disciplines (17-19, 23). It means that in the present research, the study habits of most students also were moderate. Nourian et al. (2004) reported that the main problems of students in study habits included budgeting time, concentration, reading speed, taking notes and comprehension, respectively (23). In the research of Koshan et al. (2006), the score of budgeting time, physical conditions for study, reading ability, taking notes, learning motivation, memory, and general health was moderate (24).

The weakness of the study skills among students can be attributed to the increase of technology-based education and the pace of change in the learning and teaching process (25). The present study evaluated the effect of TBL on learning behaviors and showed its effect on self-directed learning. The post-test score of the students were significantly higher than pre-test (26) and this change could be due to a change in the style of study and learning.

The results also indicated a difference between the mean scores of students' study habits before and after TBL based intervention, which was in agreement with the results of Torshizi (2013) and Koshan (2006). Improving the behavior of study habits can be based on cognitive skills of individuals and educational strategies that are changed through educational interventions. TBL increases the academic performance and knowledge, which results in self-directed learning due to the improvement of study habits and learning style (18, 24).

Furthermore, findings indicated the significant difference between study habit scores of before and after intervention in aspects of time

management, physical condition for study, health, reading ability, taking notes, learning motivation and taking the examination, while memory aspect showed no significant difference. Although the limited research carried out on the field of TBL have not studied the direct effect of training methods on study habits of students, they only have evaluated its effect on educational outcomes including knowledge (6, 27-29), academic performance (30-32), academic achievement (33) and other aspects of study habits. The findings of some of these studies (7, 32, and 34) confirm the effect of TBL on time management aspect. However, the study of Hashikar et al. (2016) demonstrated the negative view of the student toward the importance of time management and they considered TBL method as a time-consuming approach for students and lecturers (35).

In the aspect of reading ability, the results were in agreement with those of Fereydouni Moghadam (17) and in the aspect of taking notes; the results were consistent with those of Sharaf and Boehler. Therefore, learning activity and focusing on the core of the content, writing, and feedback after the learning process are the effective points of TBL approach (36, 34).

The results of the health aspect of study skills inventory, which showed the increase on health score after TBL intervention, were in agreement with the studies of McRae (2017) and Zeng (2017). In these studies, the researchers believed that TBL creates a sense of effectiveness in team members, which is followed by physical and mental health, a sense of agreement with group and satisfaction (27, 37). A review study showed that in most studies, students reported TBL as a positive learning experience (38) and this learning method not only improved their satisfaction with the course but also improved their learning skills (7). While in the study of Travis (2016), TBL has been mentioned as a workload enhancer for

learners and teachers and they pointed out that traditional teaching methods could also be used (32).

In the aspect of motivation and learning, the results of the present study were in agreement with those of Al Kawas et al. (2016) and Travis et al. (2016). In the methods of critical thinking, which pay attention to the non-stress environment, open communications, and improvement of social skills, motivation, innovation, creativity, and self-management are improved. In the other word, when students are involved in active learning approaches, not only their study skills is improved, but also results in maintaining scientific content, focusing greatly on the different dimensions of the learning environment, the tremendous impact on motivation, creativity and re-creation in serious or critical situations of professional performance (7).

In most of the aspects, the mean scores were increased after the intervention, except memory. Therefore, there was no significant difference in memory aspect. The results were in contrast with those of Hashikar et al. (2016). The researchers indicated that in TBL, because of integration and durability of concepts in mind students spent less time to memorize them (35).

In examination taking aspects, the present study was consistent with those of Travis et al. (2016) and Alnohair and Sharaf (2017) and all these studies confirmed the success of TBL method in periodic and graduate exams(32, 36).

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The limitation of the present study was the lack of control group due to the small number of sample per semester. Besides, having control group was impossible in this research due to the communication of students under intervention with the control group. It is suggested that the researchers in future evaluate the study habits with bigger sample size to compare two TBL and teacher-centered learning.

Conclusion

The results showed that although TBL improved the study habits, they were not satisfactory in most students. Therefore, considering the importance of study habits in the learning process of students, this situation should be addressed by educational authorities. It seems that student-centered learning approach helps the improvement of students' study habits.

Acknowledgment

This research was supported by a grant from the Golestan University Medical Sciences and was approved by Ethics committee of Golestan University of Medical Sciences with the number of IR.GOUMS.REC.1394.37. The authors wish to thank all students for their kind cooperation. We extend special thanks to Counseling and Reproductive Health Research Center and Nursing and Midwifery Faculty for their support and efforts to perform this project.

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