Effect of Team Based Learning on the Performance of Nursing Students in Nursing Administration Course

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Abstract

Background: Team based learning is a student centered, active learning method, requiring less faculty time. TBL foster a deeper understanding of content and facilitating the application of concepts in complex situations**. The aim of the study:** was to assess the effect of team based learning on the performance of nursing students in Nursing Administration course. **Subjects & Methods: Research design:** A quasi experimental design was used**. Setting:** faculty of nursing, Zagazig University. **Subjects:** all nursing students in fourth year (n=304) divided into control and study groups**. Tools of data collection:** Four tools were used for data collection; readiness assurance test, team based learning assessment instrument, classroom engagement survey, and clinical evaluation checklist. **Results**: Results revealed that the highest percent of students had accountability and satisfaction with team based learning 90.8% & 93% and majority of them (90%) preferred TBL. The students' scores of engagement and performance were higher in the TBL group than the traditional lecture group. **Conclusion:** The performance score of students who learnt by TBL was higher than students who learnt by traditional lecture and students' scores were higher in group readiness assurance tests were higher than individual tests. **Recommendations:** Integrate Team based learning in the faculty as an interactive learning method, and investigate the effect of Team Based Learning on students' achievement in other courses.

Keywords: *Nursing administration- team based learning- nursing students- performance*

Introduction:

A key challenge for nurse educators in Higher Education Institution is the judicious selection of teaching and learning strategies which enable students to analyze integrate and apply a range of knowledge types that inform the clinical decision-making required to deliver competent and compassionate nursing care in the workplace [1]. Students in baccalaureate nursing programs learn basic nursing skills; concepts of health maintenance and promotion, disease prevention; supervisory and leadership techniques and practices are taught, along with an introduction to research. Clinical course work includes experience in public health nursing, community health settings, and leadership responsibility within the acute care hospital [2].

The rapidly evolving team-based care environment has created a need for change in nursing practice and education [3]. TBL is a well-defined, active learning strategy that combines pre-class guided self-learning with in class small group active learning [4]

The team-based learning (TBL) approach was created forty years ago by Dr. Larry Michaelsen as a method to facilitate classroom participation with a large number of learners. Since its beginning, TBL has been used successfully in various professional disciplines, including business, law, engineering, medicine, and nursing [5].

The process of TBL involves a specific sequence of activities, Mennenga and Smyer (2010) provided a clear model for implementing TBL in a nursing course. Faculty members provide readings and other instructional material for learners to study before class. At the beginning of

the class, learners take an Individual Readiness Assurance Test (IRAT) followed by a Group Readiness Assurance Test (GRAT). Small groups of 5 to 7 learners are formed at the beginning of the semester and continue to work together throughout the course. After the IRAT and GRAT, groups work on activities that are designed to enhance their understanding of the course content [6].

Many practitioners of TBL have argued that the benefits of TBL include increased student engagement and enhanced student competencies in lifelong learning characteristics, such as communication, interpersonal, teamwork, applying knowledge to real-world problems, critical thinking, and attitude about learning, and increased student knowledge performance [7].

One major disadvantage to using TBL in the classroom is that the preparation needed to be completed by the educator prior to the start of classes is time-consuming and labor intensive [8].

Significance of the study

In the complex medical field, nursing professionals are required to perform various nursing duties to meet the need of the consumers in the healthcare field [9]. Subsequently in order to prepare nurse graduates to meet these needs in the workplace, active involvement in learning is needed in all aspects of nursing education. The nursing classroom is an appropriate setting to provide students with opportunities to apply learned content to situations they will encounter in practice [10].

In addition to developing problem-solving skills, classroom time may be used to develop essential professional competencies such as interpersonal and teamwork skills. Additionally team based learning is an instructional strategy that has demonstrated to promote active student learning through small group activities throughout an entire semester based on procedures for developing high performance learning teams that can students learning in almost any course

and prepare nursing student to be lifelong learners and improving knowledge retention by use of TBL strategy for baccalaureate nursing staff therefore, it is hoped that this study will motivate faculty of nursing to foster quality of nursing education and quality of graduates..

Aim of the study:

The present study aimed to assess the effect of team based learning on the performance of nursing students.

Research Hypothesis:

1. Performance scores of nursing students who learned by team based learning will be significantly better than those learned by traditional method.

2. Engagement of nursing students who learned by team based learning will be significantly better than those learned by traditional method.

3. Student engagement will have positive relationship with students' performance scores.

Subjects and methods:
Research design:
A quasi experimental design was used.
Study setting:
The study was conducted **at** Faculty of Nursing, Zagazig University.
Study subjects:
The study included all 4th year nursing students (n=304) in the academic year 2015/2016 they enrolled in the nursing administration course who agreed to participate in the study and their total number was 304. They were divided into two equal groups; study (learned by team based learning) and control (learned by traditional lecture).

Tools of data collection:
Four tools were used to collect data for this study.
Tool (I): Readiness Assurance Test for Team based learning:

It was developed by researcher based on review of current related literature, it consists of ten multiple choice questions to the six units taught in the practical part of nursing administration (Kardex, Assignment, Time schedule, time management, records and reports & performance appraisal). It contains two parts:

a. **Individual Readiness Assurance Test (IRAT)**: the test is taken individually to every student to assess students' readiness to apply knowledge in the class.

b. **Group Readiness Assurance Test (GRAT)**: the same test is retaken within the groups to ensure students have prepared for group work.

Scoring system:

Questions were scored as 1 for correct answer and zero for incorrect answer, so the total score was 10.

Tool (II): The Team-Based Learning Student Assessment instrument:

It was developed by Mennenga [11] for examining team based learning in nursing students. Only students in the study group filled it out. It consists of 33-item, grouped under three subscales:

1. **Accountability subscale**:
To asses nursing students' preparation for class and contribution to the team, and consists of 8 items.

2. **Preferences for lecture or team based learning subscale:**
To identify nursing students preference for team based learning or traditional lecture, it consists of 16 items.

3. **Students satisfaction subscale:**
To asses student satisfaction with team based learning, and consists of 9 items .

Scoring system:

It is a structured questionnaire using a five point Likert scale ranging from strongly disagree (1) to strongly agree (5) Interval scoring of the instrument was accomplished by the assignment of 1, 2, 3, 4, or 5 to positively stated items and 5, 4, 3, 2, or 1 to the negatively stated items.

- The possible range of total scores for the instrument was 33-165.
- A higher total score indicated a more positive perception of the use of team based learning.
- If the score more than 24 for accountability subscale indicated a high level of accountability.
- If the score more than 48 for preference for team based learning or lecture subscale indicated student preference for team based learning.
- If the score more than 27 for satisfaction subscale indicated a high level of satisfaction with team based learning.

Tool (III): Classroom Engagement Survey:

Developed by members of the Fund for the Improvement of Postsecondary Education FIPSE, . to measure student engagement during class time, consists of eight items, both students in study and control groups filled out the eight items

Scoring system:

It is a structured questionnaire using a five point Likert scale ranging from strongly disagree (1) to strongly agree (5). Possible scores ranged from 8-40, score higher than 24 indicated more student engagement in classroom .

Tool (IV): Students' Clinical Evaluation Checklist:

It was developed by Nursing Administration department staff to evaluate nursing students' performance toward applying steps of different skills taught in the practical part of nursing administration course. Both study and control groups filled it out.

The tool asked about personnel data such as age, gender, and covered the following six areas: (1) Kardex: consists of 32 steps, (2)Assignment: consists of 12 steps,(3)Time Schedule: consists of 29 steps, (4)time management: consists of 9 steps, (5)records and reports: consists of 69 steps grouped under:

shift report (18 steps), incident report (24 steps), medication record (13steps), statistical report (14steps) and (6) performance appraisal: consists of 58 steps grouped under: rating scale (32 steps), ranking method (12 steps), and paired comparison method (14 steps).

Scoring system:

Each step was to be checked under done or not done, respectively scored 1 and 0 for some items and 0.5 and0 for others to fit the grading system of the faculty.

Content validity & reliability:

For all tools of data collection: content validity was established by a jury of 5 experts in nursing administration from faculties of nursing at Cairo University, Ain Shams University and Zagazig University. These experts assessed the tools for clarity, relevance, comprehensiveness, applicability, and understanding. Reliability of the study through measuring its alpha Cronbach coefficient 0.89.

Field work:

Preparation phase

Preparation phase started from May 2015 to October 2015; the preparation phase includes the following:

- Reviewing theoretical and empirical literature concerning team based learning.
- Preparation and construction of data collection tools.
- Designing team based learning content.

Implementation phase

Implementation phase of this study was executed in 7months from beginning of October, 2015 in the first term till end of April, 2016 in the second term. At the beginning of the semester, students are divided into two groups; study (team based learning) and control (traditional lecture).

Students in the control group attended the course of nursing administration throughout traditional lecture. They were divided into 6 classes, each contain about 30 students.

Study group:

On the first day of the first semester, the researcher provided an introduction about nursing administration course, the course objectives, and schedule of the course units, also provides an explanation of team-based learning to the students and provided them with assurance that they can withdraw at any time. Following these activities, students progressed through team based learning process; Team-based learning involves a three phase's process: pre-class preparation, Readiness Assurance Tests, and application of course concepts.

Evaluation phase:

Immediately after completing the course for both groups (team based method and traditional lecture) the researcher collected students' performance scores in the practical part of nursing administration course, the students in the study group were invited to provide their feedback about team based learning as method of teaching as compared to lecture method through filling out Team-Based Learning Student Assessment Instrument questionnaire. Students in the study and control groups provided their feedback about their engagement in the classroom. The researcher offered students assurance that the instrument results would remain confidential.

Administrative and ethical considerations:

Permission to conduct the study was Permissions obtained after explaining the nature of the study from the Dean, Vice Dean of Education and Students' affaires and Head of nursing administration department, Faculty of Nursing, Zagazig University.

Written explanation of the nature and aim of the study have been explained to all fourth year nursing students included in the study. They were given an opportunity to refuse or to participate, and they were notified that they could withdraw at any stage of

the study; they were given a written informed consent to sign.

Statistical analysis:

Data entry and statistical analysis were done using the Statistical Package for Social Science (SPSS) revision16.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations for quantitative variables. Pearson correlation coefficient (r)) was used for continuous quantitative data and paired t- test to compare means of two independent groups. For all the tests used, statistical significance was considered at p–value < 0.05.

Results:

Table (1): Indicates that the mean age of all study sample (control and study groups) were22.24±0. 789 years and 22.14±0.691 years respectively. The majority of nursing students in the control and study groups were female and single (76.3%, 84.9%, 84.2 & 92.1respectively). Few of nursing students in control and study groups were employed alongside the study (6.6% & 3.9% respectively).

Table (2): Illustrates that there is a highly statistically significant difference (p=0. 000) between individual and group readiness assurance tests in all areas of knowledge and the group readiness assurance tests are higher than individual readiness assurance tests in all areas.

Figure (1): Demonstrates that the highest percentage of students (90%) prefers team based learning as a teaching method than traditional lecture among the study group.

Table (3): Indicates that the mean scores of performance in the study and control groups, it is obvious from the table that the mean scores in all areas of performance and the total performance score are higher in nursing students in the study group than those in the control group with highly statistically significant difference in all areas of performance between students in both groups (p = 0.000) except Kardex.

Figure (2): indicates that the highest percent of students in the study group (93 %) was satisfied with the team based learning.

Figure (3): displays that most of students in the study group (84.2%) feel engaged during classroom while most of students in control group (89.5%) didn't feel engaged in classroom.

Table (4): Reveals that that there was no statistically significant correlation between the total scores of students' engagement and performance scores of nursing students.

Discussion:

Nursing education has sought to develop teaching strategies that could cultivate students' abilities to meet the characteristics and expectations of their intended profession Cheng et al [13]. The team-based learning (TBL) is a cooperative learning model in which a team becomes a learning unit. In this learning method, students develop or improve leadership and team skills while solving various issues that arise with ongoing collaboration. In addition, the TBL has shown to be effective in the cultivation of the students' critical thinking skills through the process of self-identification of problems, evaluation, implementation, and integration of new information or ideas through active interaction and collaboration with team members Kim, E. & Hong, [9].

The findings of the present study revealed that group readiness assurance tests of students obtained the highest mean score of knowledge

than individual readiness assurance tests and showed a highly statistically significant difference between group and individual readiness assurance tests regarding students' knowledge. This improvement due to the use of team based learning allow students to learn and teach in the groups and it fosters their learning through all three auditory, kinesthetic and visual compared with traditional lecture allowed students focus on remembering and understanding only.

In the same line, Tai & Koh [14] who carried a study in Singapore to explore the implementation of TBL instructional strategy and assess students' engagement and preference for TBL and found that there was improvement in group readiness assurance test scores over individual scores. Also, Van der Putten and Vichit-Vadakan [15] conducted a study in Thailand to determine the impact of TBL on graduate students of public health and found that the students' team scores were significantly higher than the average individual student scores.

Similar results found in a study carried out by Zgheib [16] in Lebanon to examine the effects of teaching pharmacology using a TBL approach on second year medical students' satisfaction and performance and revealed that the students' group scores were better than individual scores on readiness assurance tests during the TBL. Again, Hefley &Tyre [17] who conducted a study at the University of Nebraska, Lincoln, to compare scoring methods used in readiness assurance tests in the TBL and clarified that the team scores were greater than individual scores in readiness assurance tests. As well, Addo-Atuah [18] carried out a study in New York to determine whether TBL contributes to performance and evaluate students' perception of TBL as an instructional strategy within a global health course within pharmacy students and found that the team

scores in readiness assurance test were higher than individual scores.

Moreover, this result matched with Moye et al., [19] who implemented a modified TBL strategy into a pulmonary module to improve medical students' critical thinking, teamwork and retention in the USA, and showed that the performance of the students on the team quizzes during the module was significantly better than on the individual quizzes.

In the same respect Cheng et al., [13] who carried out a study in Taiwan to employ TBL approach in a maternal child nursing course and reported that the average group readiness assurance test score was significantly higher than the average individual readiness assurance test. Another study carried out in New York by Balwan et al., [20] who assessed residency engagement, learning, and faculty/ resident satisfaction with TBL in internal medicine residency ambulatory education and concluded that the group readiness assurance test score were higher than individual test.

Concerning performance scores of nursing students, The results of the present study showed that the performance scores of students in the study group who learnt by TBL was higher than performance scores of students in the control group who learnt by the traditional lecture method. This might be due to TBL created an environment where nursing students teach and learn together; this collaboration and interaction teach practical, interpersonal and team building skills than the traditional individual learning so can assist nursing students to meet the increasing demands of nursing education.

These findings confirm the results of previous studies done by Zgheib [16] who found that the performance of the students on the summative quiz in pharmacology was significantly improved during the year TBL was implemented. Also, Addo-Atuah [18]

who found that there was qualitative evidence of the effectiveness of TBL in improving pharmacy students' performance than the traditional lecture.

As well as, Whittaker [21] who carried out a study in College of Saint Mary on baccalaureate junior nursing students enrolled in a nursing research course and found that the students' performance scores were significantly higher in the team-based learning intervention group. Similarly, Yang et al., [22] who conducted a study in China to evaluate team-based, lecture-based, and hybrid learning methods for neurology clerkship and found that the groups using LBL performed better in the practice test. Again, Cheng et al., [13] who assessed the effects of Team-Based Learning on learning behaviors in the maternal-child nursing course and mentioned that students' performance was improved in the maternal-child nursing course after implementation of TBL.

The present study in agreement with the study carried out by Jacobson [23] in Iowa State University to understand how the change in pedagogy from a traditional lecture style to a TBL course impacted the students' performance and demonstrated that there was a slight increase in engineering students' performance with TBL compared to a traditional lecture-based class.

The current findings consistent with a study carried out in Hofstra University, New York by Janotha [24] who examined to what extent TBL, in two foundational undergraduate nursing courses, affected student self-directed learning readiness and academic performance and found that the use of the teaching and learning strategy TBL improves student performance. And Branson et al., [5] who conducted a study in the United States to determine the efficacy of TBL in an undergraduate nursing course with regard to academic performance and found that there was significantly better students' performance and

greater perceived benefit in the TBL course than in the lecture-based course.

The findings of the current study are contradicting with results of a study carried out by Mennenga [11] in South Dakota State University to assess TBL engagement and accountability on nursing students and found that there was no significant difference in performance scores between students in TBL and traditional lecture. Also, Kniewel [25] carried out a study in the College of Saint Mary on nursing students to describe the effects of TBL as an instructional strategy on students' learning in undergraduate nursing education in and found that the performance was significantly higher for the lecture group students than the TBL group in one of the senior nursing courses.

On the contrary, a study carried out in North Carolina by Smith [26] who determined if the use of Team-Based Learning is more effective in terms of student achievement than the traditional lecture method in an anatomy course at a state university medical school and found that the TBL did not significantly improve students' achievement. This may be due to the integration of TBL in the course is new and require revision before implementation.

Also, Hettler [27] who conducted a study at Duquesne University to assess the effects of using TBL and the other traditional lectures on medical students' performance and found that there was no significant difference in students' performance in TBL and lecture groups. This could be related that the sequence and nature of the course affect the implementation of TBL activities.

Concerning students' accountability during TBL, the present study findings revealed that the highest percentage of nursing students in the study group had a high level of accountability during TBL. This may be due to that TBL is a new method of

teaching and the students wished to contribute to their team members learning, and view this method focus on them rather than lecture and they like more classes to be like this TBL session.

This result consistent with Van der Putten and Vichit-Vadakan [15] they reported that TBL clearly increased individual accountability through readiness assurance test and case study preparation. In the same line Leisey et al., [28] who revealed that the students in TBL had a high level of accountability. Also, this result supported by Branson et al., [5] who stated that the students reported a moderate to high degree of accountability during TBL.

Regarding students' preference for TBL, The present study results revealed that the highest percentage of nursing students preferred TBL as a teaching strategy. The explanation of these results may be due to most of nursing students agreed that they remember material well after application exercise used in TBL, they do better on exams when they used TBL to cover material and remember information longer when they go over it with team members during the group readiness assurance tests used in team-based learning. As well as the TBL emphasis on developing permanent teams over the course as a fundamental strategy for enhancing the learning process and build bridges a connection between knowledge and practice.In the same line, Tai & Koh [14] who found that the team based learning is the preferred mode of learning by 2nd year medical students attending the evidence-based medicine course. Also, Van der Putten and Vichit-Vadakan [15] who found that the students' perceptions toward TBL were positive and most of them preferred TBL. Similarly, in Egypt, the study done by Ahmed [29] who determined the effectiveness of implementing team building strategies program by using TBL on nursing interns at Benha University Hospital

and found that the highest percentage of nursing interns preferred TBL during all phases of the program.

The findings of the current study were in agreement with the study carried out in Sharjah University, UAE by Elnagar and Ali [30] who evaluated whether the propose modified TBL would improve students' experience of in class engagement and their attitude toward the value of using them in learning and showed that all students preferred TBL in the curriculum compared to traditional learning. As well as the previous studies of Leisey et al., [28] and Branson et al., [5] who asserts that the students preferred TBL as a teaching method than other methods.

Contradicting with this finding, the study done by Kniewel [25] who assess the effect of TBL on nursing students and found that the students expressed neutrality about their experiences with TBL. This could be related that this study was carried in four nursing courses with seven instructors; this variability may affect students' ability to learn from TBL. Again, the study carried out in India by Birk [31] who understand how students view TBL and if student perspectives change across one semester in first year medical curriculum, and concluded that the students felt neutral towards preferring TBL compared to lecture both at the beginning and end of the semester.

Concerning students' satisfaction with TBL, the present study results revealed that the highest percentage of nursing students were satisfied with TBL. This may be due to that more than half of students agreed that they had a good experience with team based learning, learn better in a team setting and think TBL will improve their grades. As well as the students enjoyed the course using team-based learning activities; the small group activities increased students' enthusiasm for the course and peer interactions increased overall satisfaction with TBL.

In the same context, the study done on medical students in India by Rawekar et al., [32] who assessed the perception of medical students regarding TBL and found that all the students agreed that TBL created interest in the Physiology course and most of them were satisfied with TBL.

Also the study carried out by Ahmed, [29] who found that the highest percentage of nursing interns were satisfied with TBL during all phases of the program. Again, Roh et al. [33] carried out a study in Korea to describe students' satisfaction and identify factors that determine satisfaction with TBL among second year nursing students and found that the students reported high overall satisfaction. Similarly a study carried out in Korea by Kim & Hong [9] who identified the effects of TBL on adult health nursing students' core competencies and they concluded that the students were highly satisfied with TBL. Again, the study done by Branson et al., [5] who indicated that the students were generally satisfied with TBL.

Regarding students' engagement, the findings of the current study showed that most of students in the study group feel engaged during classroom while most of students in control group didn't feel engaged in the classroom and there was a highly statistically significant difference. This could be related to team interactions and collaborations during TBL activities which promote students' learning interests; they felt they interact well with their teams which promote their discussion and team work that further lead to more active engagement in class assignments and activities.

These results are consistent with Tai & Koh [14] who found that the students reported a higher level of engagement with team learning than a conventional tutorial. Also, Mennenga [11] who revealed that the students taught by TBL strategy reported higher levels of engagement compared to students who taught by traditional lecture with a highly statistically significant difference.

In the same line Cheng et al., [13] who found that the TBL significantly influenced the students' classroom engagement and the students had higher scores in the. Again, Leisey et al., [28] who reported that the TBL promote high students' engagement. And, Balwan et al., [20] found that TBL results in active resident engagement. Additionally a study carried out in Stony Brook University, New York by Carol and Ratta [34] who described the use of TBL within a flipped Classroom setting in undergraduate nursing education, and demonstrated that TBL improved students' engagement level in the classroom.

Regarding correlation between students' engagement in the classroom and their performance, the findings of the current study demonstrated that there no correlation between students' engagement and their performance. This could be attributed to that the physical layout of the class and inflexibility of the seating arrangements are barriers to effective interaction and TBL requires students vigorously engage each other and interact together to successfully complete the course activities.

Contradicting to these results, Mennenga [11] found a positive relationship between student engagement and their performance scores. Also Vaughan [35] conducted a study at Mount Royal University to investigate the impact of collaborative learning applications for students learning and engagement in the first year undergraduate course and found small to moderate correlations between students' engagement in the classroom and their performance scores.

Conclusion:

In the light of the main study findings, it can be concluded that a high percent of students had accountability, were satisfied with TBL,

and preferred TBL than lecture. Additionally, students in the study group feel more engaged while in the control group didn't feel engaged in the classroom with a highly statistically significant difference in students' performance score of students who learnt by TBL was higher than students who learnt by traditional lecture.

Recommendations:

On the basis of the current study findings, the following recommendations are suggested:

- Integrated Team based learning in the faculty as an interactive learning method.

- Teaching staff should be trained to apply and use Team Based learning approach.
- Prepare booklet containing planning and implementation of team based learning for faculty staff.

- Educational program should give attention in developing teaching methods that enhance student engagement in the classroom.
- Investigate the effect of Team Based Learning on students' achievement in other courses.
- Replication the study on nursing students in other faculties.

Table (1): Personal characteristics of nursing students (N=304):

	Control group (n=152)		Study group (n=152)	
	No	%	No	%
Age in years				
21	21	13.8	24	15.8
22	83	54.6	86	56.6
23-25	48	31.5	42	27.6
Mean ± SD	22.24±0. 789		22.14±0.691	
Gender				
Male	`36	23.7	23	15.1
Female	116	76.3	129	84.9`
Marital status				
Single	128	84.2	140	92.1
Married	24	15.8	12	7.9
Working alongside study				
Yes	10	6.6	6	3.9
No	142	93.4	146	96.1

Table (2): Mean scores of readiness assurance tests for study group (n=152)

Topics of Knowledge	Individual (No=152) Mean±SD	Group (No-28) Mean±SD	t-test	p-value
Kardex	8.83±1.5	9.64±0.55	72.6	0.000(**)
Assignment	8.86±1.38	9.57±0.57	78.2	0.000(**)
Time Schedule	8.73±1.44	9.6±0.62	74.28	0.000(**)
Time management	8.82±1.5	9.67±0.54	72.4	0.000(**)
Performance appraisal	8.86±1.38	9.64±0.48	78.83	0.000(**)
Records & reports	8.73±1.44	9.75±0.44	74.28	0.000(**)
Total	52.9±5.5	57.9±2.23	122.16	0.000(**)

** Correlation is highly statistically significant at P < 0.01

Table (3): Mean scores of performance in the study and control groups (n=304)

Area of performance	Control group (n=152) Mean ±SD	Study group (n=152) Mean ±SD	t- test	Sign
Kardex	17.67±1.06	19.48±12.6	-2.118	0.231
Assignment	13.8±0.64	14.2±0.52	-6.035	0.003(**)
Time Schedule	18.78±0.98	19.42±0.67	-5.59	0.000(**)
Time management	8.2±0.82	9.47±0.55	-16.010	0.000(**)
Performance appraisal	19.73±0.52	19.92±0.23	-3.656	0.000(**)
Records & Reports	57.19±2.290	62.48±1.56	-23.527	0.000(**)
Total performance scores	136.06±3.3	143.58±11.43	-7.785	0.000(**)

** Correlation is highly statistically significant at P < 0.01
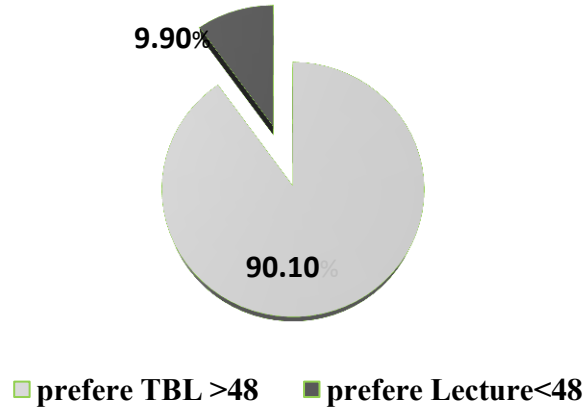
Figure (1): Percentage distribution of study group preference regarding Team Based learning in the study group (n=152)
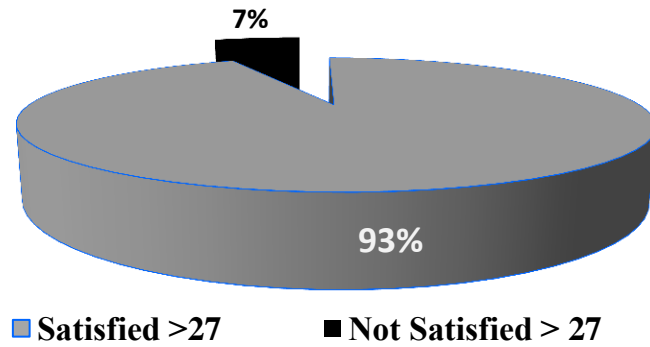

Figure (2): Satisfaction with team based learning as perceived by students in TBL group (n=152)
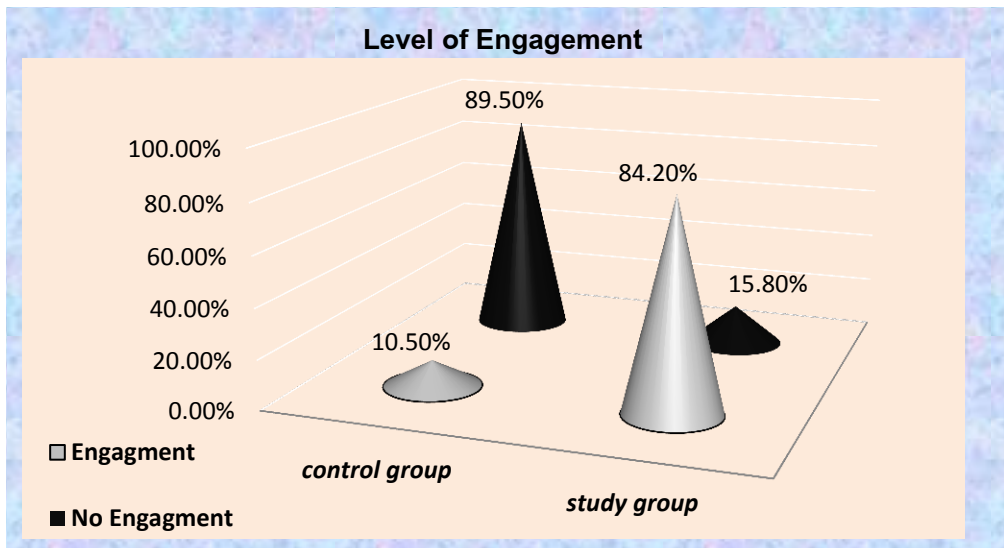

Figure (3): Percentage distribution of nursing students' Engagement level in study and control groups (n-304)

Table (4): Correlation between total scores of engagement and performance scores of nursing students in study group (n=152):

Performance area	Total score of Students' engagement with TBL	
	r	P-value
Kardex	-0.071	0.387
Assignment	0.115	0.157
Time Schedule	0.029	0.720
Time management	-0.108	0.187
Performance appraisal	0.105	0.200
Records & Reports	0.054	0.510
Total	-0.191	0.183

* Correlation is statistically significant at $P < 0.05$

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