

Effectiveness of team-based learning tutorials over conventional tutorials in 1st MBBS students studying biochemistry

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Abstract

Background: Team based learning (TBL) is a well-defined instructional strategy that is being employed increasingly in medical education. Team-based learning is based on small group interaction. This approach helps students to develop intellectual, social and personal features and also pay attention to their previous learning experience. Hence a study was taken up to assess the performance of team-based learning tutorials with conventional and to assess it's effectiveness by taking feedback from students. **Materials and Method:** A Quasi-experimental study was taken up involving 1stMBBS students of Malla Reddy Institute of Medical Sciences while attending regular Biochemistry tutorials during April-May 2018. Students were sub-grouped based on their roll numbers and all of them were exposed to both TBL and conventional methods alternatively in 2 weeks and post-test evaluation was conducted for both the groups in the form of MCQ's and analysis of post-test expressed as Mean and SD was done by paired 't' test and feedback questionnaire by evaluating the perception by five-point likert scale rating. **Results:** In this Quasi-experimental study taken up, post-test evaluation as twenty MCQ's carrying one mark each were administered to all the batches. It was observed that there was statistically significant increase in scoring pattern in students exposed to TBL compared to students exposed to conventional teaching. **Conclusion:** TBL improves gain in knowledge in undergraduate medical education, with sustained and continuing improvement, promote greater self-directed learning.

Keywords: Team Based Learning (TBL), Conventional Tutorials.

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INTRODUCTION

Learner centered approach is the need of the hour in medical education. The current method is teacher centered and passive. Team based learning (TBL) is a well-defined instructional strategy that is being employed increasingly in medical education.¹⁻⁵ Team-based learning is based on small group interaction. Team based learning tutorials involve learners in discussion

and improve learning. This approach helps students to develop intellectual, social and personal features and also pay attention to their previous learning experience.⁶ Team based learning tutorials facilitates student in increasing his responsibility for acquisition of knowledge.⁷ Hence a study was taken up to assess the performance of team based learning tutorials with conventional and to assess it's effectiveness by taking feedback from students.

Objectives: In the present study taken up in the department of Biochemistry, we were able to:-

1. Assess the effectiveness of team based tutorial as a teaching learning technique in comparison to conventional tutorials from the students of 1st MBBS studying Biochemistry.
2. Assess the perception of team based learning tutorials as a teaching learning technique among the students.

METHODOLOGY

A Quasi experimental study was taken up involving 1st MBBS students of Malla Reddy Institute of Medical Sciences while attending regular Biochemistry tutorials during April-May 2018. Ethical clearance was obtained from the institutional ethics clearance committee. Informed consent was obtained from the students for involvement in the study. Topics for tutorials were informed priorly and were different each day. Students based on their roll numbers were subgrouped into A1 (1-25), A2(26-50), B1(51-75), B2(76-100), C1(101-125) and C2(126-150). Groups A1,B1,C1 and A2,B2,C2 were taken up for team based interactive tutorials and conventional tutorials respectively in the first week. The students for TBL were regrouped into five or six and a subtopic was allotted with each subgroup and were followed to discuss the topic for 30 minutes. A member from each group were asked to present to all the other students involved in TBL. During the session of TBL, the teacher was just a observer and would summarize in the end. The other group students were involved with routine traditional teacher centered conventional tutorial. Post test evaluation was conducted for both the groups in the form of MCQ's. In the next week, students from A2, B2, C2 and A1,B1,C1 were taken up for team based interactive tutorials and conventional tutorials respectively. Tutorials were conducted in consequent

weeks so that all 1st MBBS students experienced both types of tutorials. A total of 132 students underwent TBL tutorial and 128 students underwent conventional tutorial. Feedback in the form of a questionnaire was taken up from the students at the end of second session. Analysis of post test expressed as Mean and SD was done by paired 't'test and feedback questionnaire by evaluating the perception by five point likert scale rating.

RESULTS

In this Quasi experimental study taken up, post test evaluation as twenty MCQ's carrying one mark each were administered to all the batches. Topics and post test were common for batches A1 and A2, B1 and B2, C1 and C2 respectively. On post test analysis, mean and SD for A1 and A2 were 16.34 ± 2.05 and 10.86 ± 1.73 , B1 and B2 were 15.62 ± 1.98 and 10.44 ± 2.12 , C1 and C2 were 16.09 ± 1.74 and 11.13 ± 2.04 respectively in the first week of this study showing an extremely significant difference ($p < 0.001$) in scoring pattern. Post test analysis, mean and SD for A2 and A1 were 15.98 ± 2.17 and 11.34 ± 2.15 , B2 and B1 were 16.28 ± 1.61 and 10.67 ± 2.43 , C2 and C1 were 15.83 ± 2.44 and 11.01 ± 1.87 respectively in the second week of this study showing an extremely significant difference ($p < 0.001$) in scoring pattern.

Table 1: Comparison of Mean and SD of different batches for team based learning tutorials over conventional tutorials

Team Based Learning Tutorials			Conventional Tutorials			
Batch with roll nos	N	Mean SD	Batch with roll nos	n	Mean SD	P value
A1(1-25)	22	16.34 ± 2.05	A2 (26-50)	21	10.86 ± 1.73	<0.001 *
B1(51-75)	21	15.62 ± 1.98	B2(76-100)	23	10.44 ± 2.12	<0.001 *
C1(101-125)	19	16.09 ± 1.74	C2(126-150)	22	11.13 ± 2.04	<0.001 *
Batch with roll nos			Batch with roll nos			
A2(26-50)	23	15.98 ± 2.17	A1(1-25)	22	11.34 ± 2.15	<0.001 *
B2(76-100)	24	16.28 ± 1.61	B1(51-75)	21	10.67 ± 2.43	<0.001 *
C2(126-150)	23	15.83 ± 2.44	C1(101-125)	19	11.01 ± 1.87	<0.001 *

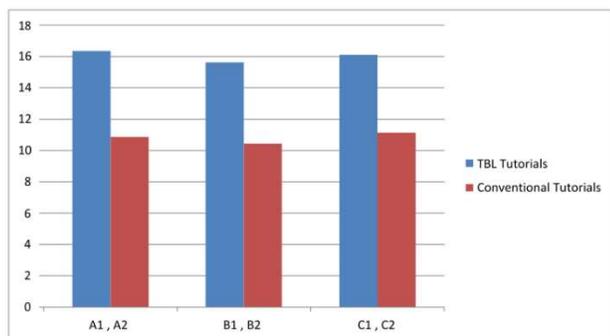


Figure 1

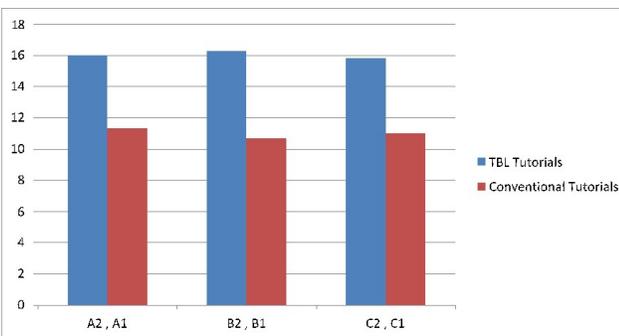


Figure 2

Figure 1: Assessment of post test scoring with tbl tutorials and conventional tutorials in first week; **Figure 2:** Assessment of post test scoring with tbl tutorials and conventional tutorials in second week

Table 2: Students feedback questionnaire analysis expressed in percentage

Sl no.	Question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Is team based learning useful for better learning of the subject?			9.1	34.8	56.1
2	Was team based interactive tutorial helpful than conventional?		1.5	9.2	41.6	47.7
3	Did this new method enhance the skill and confidence of the learner?			2.4	15.1	82.5
4	Did it help in clarification of doubts?		14.3	7	52.2	26.5
5	Did Team based interactive tutorial help to improve the scoring in tests?		5.4	6.8	46.9	40.9
6	Was it an enjoyable learning?			1.5	18.2	80.3
7	Did it encourage in the studying process of learners?		11.3	1.2	31.8	53.7
8	Should team based interactive tutorials be incorporated along with regular teaching?		9.1	2.3	51.5	37.1

Analysis of the feedback questionnaire from the students revealed 56.1percent were for team based learning useful for better learning, 89.3 percent shared team based interactive tutorial helpful than conventional, 82.5 percent opined TBL enhanced their skill and confidence in learning, 78.7 percent opined TBL helped in clarification of doubts, 87.8 opined Team based interactive tutorial helped to improve the scoring in tests, 84.5 percent opined TBL encouraged the studying process 88.6 percent opined TBL should be incorporated along with regular teaching.

DISCUSSION

Team based learning is increasingly used for medical education^{8,9} TBL is a teacher-directed method that promotes application of knowledge using small groups in a single venue.¹ It increases learner engagement,¹⁰⁻¹¹ promotes active learning, and is perceived as enjoyable by learners.¹² In our present study, scoring pattern for post test was significantly higher in comparison to conventional tutorials. This is in accordance with study conducted by Nigel CK *et al.* who contemplated Students taught by TBL report high engagement which may promote greater self-directed learning³ Our study is also in accordance with study by Tripti Srivastava who contemplated TBL would foster interactive learning and positive cognitive effects, such as activation of prior knowledge, recall of information, individual and collaborative knowledge construction, and cognitive conflicts leading to conceptual change.¹ As learning needs to be an active constructive mental activity; to make someone understand a particular area of knowledge, it is best to involve them. TBL serves the said purpose in allowing students to handle the topic analytically with individual participation, thus improving higher cognitive skills. Active participation, collaborative team work, opportunity to improve their presentation skills, were an appreciated feature of this method.

CONCLUSION

To conclude, TBL improves gain in knowledge in undergraduate medical education, with sustained and continuing improvement, promote greater self-directed learning and helps students to develop intellectual, social and personal features and makes learning easier.

REFERENCES

1. Britta M Thompson, Virginia F Schneider, Paul Haidet, Ruth E Levine, Kathryn K McMahon, Linda C Perkowski, Boyd F Richards. Team-based learning at ten medical schools: two years later *Medical Education* 2007; 41: 250–257
2. Seidel CL, Richards BF. Application of team learning in a medical physiology course. *Acad Med* 2001;76 (5):533–4.
3. Haidet P, O'Malley KJ, Richards B. An initial experience with team learning in medical education. *Acad Med* 2002;77 (1):40–4.
4. McInerney MJ. Team-based learning enhances longterm retention and critical thinking in an undergraduate microbial physiology course. *Microbiol Ed J* 2003;4 (1):3–12.
5. Hunt DP, Haidet P, Coverdale JH, Richards BF. The effect of using team learning in an evidence-based medicine course for medical students. *Teach Learn Med* 2003;15 (2):131–9.
6. Team-Based Learning: A New Approach Toward Improving Education Rita Rezaee1, Neda Moadeb, and Nasrin Shokrpour *Acta Med Iran*, 2016;54(10):678-682
7. Implementation of team based learning in year 1 of a PBL based medical programme. Burgess A, Ayton T, Mellis C. *BMC Med Educ*.2016,16:49
8. Haidet P, Fecile ML: Team-based learning: a promising strategy to foster active learning in cancer education. *J Cancer Educ* 2006, 21:125-128.
9. Issues as an alternative to anatomy lectures in Team-Based Learning curriculum. Stylus Publishing;2007:
10. Thomas PA, Bowen CW: A controlled trial of team-based learning in an ambulatory medicine clerkship for medical students. *Teach Learn Med* 2011, 23:31-36
11. Haidet P, Morgan RO, O'Malley K, Moran BJ, Richards

- BF: A controlled trial of active versus passive learning strategies in a large group setting. *Adv Health Sci Educ Theory Pract* 2004, 9:15-27.
12. Levine RE, O'Boyle M, Haidet P, Lynn DJ, Stone MM, Wolf DV, Paniagua FA: Transforming a clinical clerkship with teamlearning. *Teach Learn Med* 2004, 16:270-275.
 13. Nigel CK Tan, Nagaendran Kandiah, Yiong Huak Chan, Thirugnanam Umapathi, Sze Haur Lee and Kevin Tan. A controlled study of team-based learning for undergraduate clinical neurology education. *BMC Medical Education* 2011, 11:91
 14. Tripti Shrivastava, Lalitbushan Waghmare. Interactive Intra-Group Tutorials: A Modification To Suit The Challenges Of Physiology Tutorial In Rural Medical Schools. *National Journal of Physiology, Pharmacy and Pharmacology*. 2014:Vol 4(2): 128 – 131.

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