

Role of symposia to enhance active learning compared to conventional lectures among MBBS students



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ABSTRACT

Background: Symposium as a large group teaching learning method ensures active participation from students compared to conventional lectures. Competency-based curriculum lays emphasis on student-centered learning. The number of students who join medical colleges to pursue MBBS increase each year. At the same time, infrastructure and faculty strength do not change much. Though small group teaching is preferred student-centered method, other teaching learning methods can be modified accordingly.

Aims and Objectives: To assess the effectiveness of symposium-based learning (SBL) in enhancing active learning compared to conventional lecture in Phase 1 MBBS students with a secondary assessment of student's comparative perception of both teaching learning methods in a teaching institution. **Materials and Methods:** We selected six-core gross anatomy topics which were discussed in the dissection table prior to the sessions. Students were grouped into two by odd and even roll numbers. One group underwent SBL while the other had conventional didactic lectures (DL). The groups were crossed over after three topics. The students in both groups were assessed for knowledge retention at the end of each session by identical questionnaires. The perception of students was collected by feedback questionnaire in Likert scale. Assessment scores were compared using independent *t*-test.

Results: According to perception of students, active learning was improved by symposia (83.5%). Symposia also improved presentation skills (86.9%). **Conclusion:** Although students believed that symposia improved active learning. Analysis of assessment scores showed no significant enhancement of active learning in students through symposia as teaching learning method compared to DL.

Key words: Learning; Lecture; Medical students; Teaching method

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INTRODUCTION

Learning methods like lecture, symposium, panel discussion and team teaching are effective for large group learning. Didactic lectures (DLs) have been the traditional method of large group learning in higher education where the acquisition of knowledge takes place only by passive learning. During preclinical years in medical curriculum, a large number of classes are taken as DL which delivers more knowledge within a limited time. Although more knowledge is disseminated through DLs, studies reveal

optimal student engagement in only 20 min of a one hour lecture.¹

The effectiveness of a DL is measured either by performance of the teacher or by the importance of the subject.² It is challenging to incorporate adult learning principles in DL sessions. Anatomy is one of the core subjects which has a maximum number of learning hours during preclinical years. Symposium is a method of large group learning wherein a group of learners presents different aspects of a common subject followed by collective learning through

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discussion. As it is student-centered learning, active learning takes place in symposium-based learning (SBL).

Active learning has been shown to enhance student performance in undergraduate Science, Technology, Engineering, and Math Courses.³ Canadian accreditation committee for medical schools recommends that medical programs include opportunities for medical students to work in active learning environments so that they can develop lifelong learning skills desirable of modern physicians.⁴ Student-centered learning is a theory of adult learning principle which shows an enhancement of active learning. The academic performance increases in such learning environment.⁵ Indian Graduate Medical Regulation 2019 also recommends delivery of student-centered curriculum. A fixed number of small group teaching hours are allocated in each subject. Moreover, the number of students who are permitted to pursue MBBS in the medical colleges increase each year. Accordingly, the infrastructure and the faculty strength do not change. Thus, it is necessary to adopt other student-centered learning methods which can accommodate more students.

Aims and objectives

The objective was to assess the effectiveness of SBL in enhancing active learning compared to conventional DL in Phase 1 MBBS students with a secondary objective of assessing student's comparative perception of both teaching learning methods.

MATERIALS AND METHODS

The comparative trial was performed as part of the course components of the Advanced course in medical education under the auspices of the Nodal center of the National medical council of India, 175 Phase I MBBS students in a teaching institution were randomized by their roll number split into two groups.

Category 1 comprised students with odd roll numbers and Category 2 with even roll numbers. All students who gave informed consent were counted for the study. Six topics, namely, radial nerve, elbow joint, blood supply of heart, anterior triangle of the neck, suboccipital triangle of neck, and fascial spaces of head and neck, were selected based on the anatomical dissection class schedule. Three topics were learnt by SBL by one group while the other group learnt the same topics through DLs, both methods facilitated or delivered by faculty from the anatomy department. The two groups were crossed over for the learning method for the next three topics.

SBL

The symposia group was allotted the topic 1 week prior to session with subtopics being allocated to volunteers from that group who would present these using charts and blackboard to the rest of the group followed by a facilitated group discussion in SBL. At the end of the presentation and discussion the SBL group was allowed to self-revise their learning by seeing the same powerpoint slides used for DL in the other group. A post-test was conducted after each session to both groups using short answer questions and spotter questions.

Feedback was collected from all students at the end of 6 sessions using a 7-question questionnaire on a 5-point Likert scale.

Data collection and statistical analysis

Post-test scores secured for each assessment by both groups were compiled in MS Excel (Microsoft Corp, USA) and statistical analysis was done using SPSS version 16 (IBM Corp). Comparison of scores was analyzed using independent *t*-test. Level of significance was kept at 5%.

RESULTS

One hundred and seventy-five students were enrolled for the study with 75 (42.86%) men and 100 (57.14%) women (Figure 1).

The age of students varied from 18 to 26 with a mean age of 19 years. All students had completed their higher secondary education with three students having completed other clinical professional bachelor degrees such as BHMS and BAMS. They were comparable in all academic aspects.

The scores achieved by both groups for all topics were found to follow normal distribution.

The scores obtained by the SBL group were compared with those achieved for the same topic by the DL group

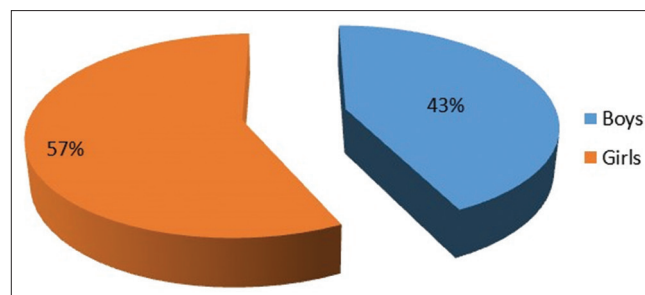


Figure 1: Number of participants

and their difference was assessed for statistical significance using paired *t*-test.

Among six topics, the post-test score analysis showed significant difference only in one topic (radial nerve- $P=0.008$) where the mean scores obtained with SBL were higher than that of DL (Table 1).

The perception of students was assessed by questionnaire on 5-point Likert scale and compared by frequency of responses (Table 2).

Majority of students suggested that symposia improve active learning (7.2+76.3=83.5%) although post-test scores showed not much significant difference. But they did not have the opinion that all topics could be taken as symposia (43.4+38.8=82.2%). 45.4% (4.6+40.8) students had opined that symposia could be used as a better teaching/learning method than conventional lecture while 27% disagreed this and 27.6% took a neutral stand. Most of the students had no doubt that symposia improve presentation skills (39.5+47.4=86.9%). About 67.1% of students did not agree that symposia were not helpful in recollecting facts (disagree-41.4 and strongly disagree 25.7).

Correlation of marks obtained in the two teaching/learning methods with students' perception was assessed. During analysis, only one topic- radial nerve showed a positive correlation ($r=0.202$, $P=0.015$). There was no significant correlation in other topics.

DISCUSSION

The teaching/learning methods were broadly classified into three main groups- mass instruction methods, individualized learning methods, and group learning methods.⁴ Most reviews support the enhancement of knowledge with student directed learning activities. The revised curriculum for undergraduates envisages more active learning opportunities. Active learning environments encourage medical students to develop lifelong learning skills.³

When symposia were added as a teaching/learning method to medical master's program, it was found that students' appreciation about applied teaching methods were high in 3rd and 2nd year students compared to 1st year students.⁶

Active learning improves student performance with improved pass rates in students when compared to those learning through conventional lectures.² In the present study, where we compared active learning enhancement through SBL to learning by traditional DLs by analyzing the post-test scores, we found no significant advantage in favor of SBL except in one topic- radial nerve. However, upon analysis of the student evaluation, most students (83.5%) agreed that active learning took place in symposia. Small group learning methods such as seminars were found to enhance the performance in examinations compared to conventional lecture.⁷ The similar results were found

Table 1: Comparison of post-test scores between symposium and lecture

Topic	Post Test Score (max=10)			
	Mean with SD Symposium	Mean with SD Lecture	Mean difference	P-value
Radial nerve	6.94±1.851	5.99±2.325	0.951	0.008*
Anterior triangle	8.58±1.468	8.14±1.541	0.439	0.080
Fascial spaces of head & neck	7.70±1.443	7.28±1.720	0.424	0.121
Blood supply of heart	6.741±1.460	6.861±1.715	0.1203	0.636
Elbow joint	8.09±1.368	7.79±1.443	0.0009	0.997
Sub occipital triangle	7.894±1.849	7.895±1.516	0.306	0.193

Table 2: Perception of students

Questions	Perception					Total
	Strongly Agree 4	Agree 3	Neutral 2	Disagree 1	Strongly disagree 0	
1. Symposia enhance active learning	7.2	76.3	13.2	2.6	0.7	100
2. Prior preparation is needed for easy understanding of topic	50.7	43.4	5.3	0.7	0	100
3. Symposia are not helpful for recollecting facts	0.7	3.3	28.9	41.4	25.7	100
4. Conventional lecture notes are most useful in examination	13.8	25	48	11.2	2	100
5. All topics can be taken for symposia	0	3.9	13.8	43.4	38.8	100
6. Symposia improve presentation skills	39.5	47.4	10.5	2.6	0	100
7. Symposia can be used as a better teaching method compared to conventional lecture	4.6	40.8	27.6	22.4	4.6	100

in assessment scores comparing traditional lecture and lecture based on problems. The students scored more in lecture-based on problems.⁸

However, Morton and Colbert-Getz observed that there was no difference in the ability to recall or recognize (knowledge level) material on a final examination in students who attended flipped class room and conventional lecture class of anatomy.⁹

Prior studies proved that students appeared examination driven in their learning and were concerned about what they needed to know for the knowledge test. They viewed lectures as a method of imparting factual information, where the content could be revisited outside the lecture theatre in their wider learning and revision.¹⁰ In the present study, students did not believe that conventional lecture would improve examination results (60.2%).

Interactive and student-centric education methods were more interesting and nonboring.¹¹ In the present study, 86.9% of students opined that symposia helped in improving presentation skills. Students perceived the two teaching learning methods were equally effective ($P=0.959$). In a sub-group analysis to study the correlation between teaching learning methods and the perception of students, a weak benefit was observed only in one topic-radial nerve ($r=0.202$, $P=0.015$).

Lecture is a less preferred instructional method, as it is categorized as passive learning and offered less knowledge retention rate. The students lack attention and they have less chance for independent thinking.¹² However, these are cost-effective and efficient ways to deliver information.

Engaging teaching sessions in lecture are influenced by teacher, the quality of PowerPoint slides, and interaction with students.¹³ The passive lecture and PowerPoint bullet-slide approach to teaching would be acceptable if the knowledge required to practice were static, and if memorization were the key to successful practice.¹⁴ It is inevitable to use a variety of teaching methods and styles. The learners are exposed to different ways of learning that provide both comfort and tension during the process, ultimately giving learners multiple ways to excel.¹⁵

Limitations of the study

We observed that students in our education system are new to self-directed learning as they have just left high school dominated by proctored learning before entering Phase 1 MBBS. Students who presented the topics in SBL took part actively in the discussion but the involvement of other students was very poor. This might be due to lack

of interest among them. Repeated sessions might produce better results.

CONCLUSION

As symposia gave interactive learning environment to students, students believed that symposia improved active learning and presentation skills. However, analysis of assessment scores showed no significant enhancement of active learning. The lack of familiarity with active learning environments among Phase 1 MBBS students could be postulated as a reason for their lack of enhancement of active learning. Repeating the study among students in advanced phases of MBBS course could have showed better results.

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