

Original Article

EDUCATIONAL INTERVENTIONAL PROGRAMME TO MAKE LECTURES EFFECTIVE BY PRE-HAND DISTRIBUTION OF MULTIPLE CHOICE QUESTIONS

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ABSTRACT

Background: Declining attendance of medical students in the class and poor performance in the exams is becoming common now - a - days. Change in the teaching pattern by allowing the students to participate in the process could be one solution to the problem.

Objectives: The present study was conducted to assess the difference in performance of the students after two different methods of teaching and to find out the reasons for these differences.

Method: 100 students of the II MBBS were chosen for the study. The students were provided with topic based mcq before the lecture. They were asked to solve those MCQs before coming to the class in which lecture of that topic was to be held. Lecture was taken in participatory method. Students were allowed to ask questions as well as suggestions after the class. Three such topics were taught and tests were taken after the participatory lectures and after the conventional lecture.

Results: Students scored more marks in the tests taken after the participatory method of teaching as compared to the traditional method. Two out of three tests performed showed statistically significant difference in the marks obtained ($p < 0.0001$). The range of the marks obtained also improved with participatory method of teaching

Conclusion: There is a need to accommodate problem based learning in medical sciences on regular basis to take care of monotony of conventional lectures.

Key Words: Conventional lectures, problem based learning, MCQ

INTRODUCTION

In the early part of the twentieth century, education focused on the acquisition of literacy skills: simple reading, writing, and calculating. It was not the general rule for educational systems to train people to think and read critically, to express themselves clearly and persuasively, to solve complex problems in science and mathematics. Now, at the end of the century, these aspects of high literacy are required of almost everyone in order to successfully negotiate the complexities of contemporary life. Today's, cognitive researchers are spending more time working with teachers, testing and refining their theories in real classrooms where they can see how different settings and classroom interactions influence applications of their theories ¹.

Problem based learning (PBL) was originally introduced in the Medical School at Mc-Master University

in Canada in the late 1960s and is now a common curriculum component in medical and health science schools around the world²⁻³. PBL has become an increasingly popular alternative in medical education and literature is replete with its many benefits; like its ability to foster early acquisition of cognitive skills and encourage deep learning in students ⁴⁻⁷. It is also found to be beneficial in increasing the level of motivation by helping to develop self directed learning skills that last for whole careers and increasing intrinsic interest in the subject of study.⁸⁻¹²

METHODOLOGY

The present study was conducted in Sri Aurobindo Institute of Medical Sciences Indore which is a tertiary care medical institute as well as a regional center for medical education technology for Bihar and Madhya Pradesh. It is an interventional study done on II MBBS students where in the pitfalls of conventional lecture

method for teaching has been changed to a participatory method with the help of prior distribution of multiple choice questions based on the topic to be taught. The subjects in the study were students from II Prof MBBS. There were total 100 students in the study but only 72 students underwent both the tests. So the results are depicted for 72 students only.

Data collection: The following steps were followed for data collection.

- 1) Multiple choice questions (Mcq's) were made from important, must know and desirable to know areas of the topic.
- 2) Mcq's along with the answers (key) were distributed one week before the lecture to all the students of II Prof MBBS.
- 3) Students were asked to make efforts to know, why the given answer is correct and why other three options are not correct, referring the prescribed text book.
- 4) Lectures were thoroughly prepared and delivered using all possible audio visual aids.
- 5) 04 lectures were taken from proposed method and 04 lectures by conventional method for all the students of II Prof MBBS. Conventional method of lecture taking is the autocratic lecture in which only teacher plays the dominant role and students are mere listeners of what is being taught. Whereas in the participatory method the students are involved in the teaching process by various means for example permitted group discussions like buzz group, and brainstorming. Here we have adopted a method of distributing MCQs based on the topic to be taught before starting a lecture so as to make the students acquainted of the topic by solving MCQs.
- 6) Mcq test were performed, for topics covered by conventional and proposed lectures. The questions

prepared have ideal difficulty index and good discrimination index.

- 7) Mcq's made for the test were of three types namely-Assertion and Reasoning - 20%; Multiple responses - 20%; and Single response - 60%

Motivation of the students to take active participation in the project was achieved by regular counseling sessions. 60 such mcq's, were distributed to all the students of II Prof MBBS, one week prior to the lecture and directed them to read and solve them sincerely. Students were asked to make efforts to know, why the given answer is correct and why other three options are not correct, referring the prescribed text book. Two way discussions of the mcq's, after the lecture, gave a big boost for the students specially those who do not feel comfortable in asking the doubts.

The performance of the students was noted down as marks obtained in the tests taken on the topics which were taught by conventional method and by proposed method. The perceived differences between two methods of teaching were collected from the students with the help of a questionnaire.

Data analysis: Data was put in Microsoft excel and described with the help of measures of central tendency as mean and standard deviation, variance as range of the marks obtained and analyzed with the help of unpaired t test.

OBSERVATIONS

Tests were taken after teaching with conventional lecture method (paper I) and after teaching with participatory method (paper II) .Three types of questions were given in the test - Single response in Section A, multiple responses in Section B and assertion and reasoning of the assertion in Section C.

Table - 1: Section wise score of study participants

	Section A (Out of 5)	Section B (Out of 10)	Section C (Out of 5)	Total (Out of 20)	p value
Result of the first test					
Paper I	1.625	5.5	2.65	9.775	<0.0001
Paper II	2.1	5.9	3.575	11.575	
Result of the second test					
Paper I	3.72	4.9	3.1	11.72	0.4666
Paper II	3.23	5.2	3.5	11.93	
Result of the third test					
Paper I	3.23	5.2	3.5	11.93	<0.0001
Paper II	3.23	5.2	3.5	11.93	

Table 2 shows that there was difference in the range of total marks obtained in two tests. In test I (conventional method) it varied from 04-16 while the range of total marks in test II (participatory method) varied from 04-19.

Table - 2 Range of marks in Paper I and Paper II

Range of marks	Paper I	Paper II
1-5	9	2
6-10	12	15
11-15	16	14
16-20	3	8

Three such tests were taken after the participatory lectures using prior distribution of MCQs. The result of the tests as mean marks obtained out of 20 is depicted in table number 1. The difference in the marks obtained was tested with the help of unpaired t test.

DISCUSSION

In the present study there was a significant difference between the performance after the participatory lecture method in 2 out of three tests taken whereas in a similar study done by Duggan Paul .M et al wherein

electronic voting has been used to make the lecture participatory, but there was no difference in MCQ scores between EVS and traditional lectures ($p = 0.785$). In this setting, EVS technology used in large group lectures did not offer significant advantages over the more traditional lecture format.¹³

Hake R. R. had conducted a study entitled "Interactive-Engagement versus Traditional Methods: A Six-Thousand-Student Survey of Mechanics Test Data for Introductory Physics Courses. There was a 2 SD, difference between pre and post intervention analysis between two methods,¹⁴ Whereas in the present study two out of three tests conducted showed significant change. In the present study 82% students found the participatory method of lecture more effective as compared to the conventional lectures whereas 46.06% II MBBS pharmacology students expressed interest in microteaching and problem-based learning, whereas seminars, demonstrations on manikin and museum studies were mentioned as good adjuvant to routine teaching in a study conducted by Uma et al on teaching learning and evaluation methodology.¹⁵

In a similar study Chilwant K.S. compared two teaching methods, one structured interactive and other conventional in two groups were similar in all aspects except the teaching method adopted and found no significant difference between two but the outcome of questionnaire was in favor of structured interactive lecture method.¹⁶ On the other hand in the present study there was a significant change in the results obtained after participatory lecture method of teaching in two out of three tests conducted. Similarly Hossein et al compared the evaluation of the public health course after lecture based method and problem based method of teaching and they concluded the superiority of problem based method in statistically significant number of students ($p < 0.001$)¹⁷

CONCLUSION

From the present study the conclusion is drawn that prior solving MCQ helped the students to grasp the topic in the class, and they want the proposed method to be adopted in the routine classes. Statistically significant difference $p < 0.05$ was observed between conventional lecture and participatory lecture after distribution of MCQ related to course subject in two out of three tests conducted. Students agreed that understanding is better if they come to the class after reading the topic because this creates more concentration on important areas. They found the participatory method of lecture more effective as compared to the conventional lectures.

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