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IMPACT OF VARIOUS LECTURE DELIVERY METHODS IN PHARMACOLOGY

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ABSTRACT

The aim of the study was to assess the impact of three common lecture delivery methods viz. the lectures using chalkboard, the lectures using PowerPoint presentations and the lectures utilizing transparencies with an overhead projector. By filling in a questionnaire, the second year MBBS students were asked to assess the impact of three pharmacology lectures given by three different methods of lecture delivery. Also after each lecture an objective test was given to compare the impact of the lecture delivered by different methods. The results of the study show that as per the subjective assessment of the lectures, students preferred PowerPoint teaching the most. As far as the students' performance is concerned the impact of traditional Chalkboard and PowerPoint teaching was much more than the lectures using transparency and overhead projector (OHP).

Keywords: Audiovisual aids, teaching methods, medical education, PowerPoint, OHP, Chalkboard

INTRODUCTION

In recent years, undergraduate training in pharmacology has been revolutionized with adoption of new methods of teaching including computer assisted learning, use of audiovisual aids, role plays and clinical pharmacology studies (Sharma et al., 2004). The use of electronic media has become common in medical colleges, as in other colleges and universities.

At present, the most common ways of lecture delivery include the lectures using PowerPoint (PPT) presentations, lectures utilizing the transparency and overhead projector (TOHP) besides the traditional 'chalk and talk' method. There is no conclusive study stating the superiority of one method over the other. However, various studies have been conducted to compare the effectiveness of lectures using PowerPoint (PPT) or other such media in comparison to the lectures using chalkboard. Garg et al. (2004) have observed that students want the teachers to include audiovisual aids during the lectures, but it is not certain whether it increases their understanding or performance in the examinations. Bartsch and Cobern (2003) noted that students preferred lectures with PPT over the use of TOHP, but that in some instances the content of the PPT presentation distracted students and they performed less well on tests compared with another group given lectures using chalkboard. One extensive study comparing PowerPoint and TOHP observed no difference in student performance in tests (Szabo and Hastings, 2000) while in another study there was marked improvement in examination results when PPT replaced the use of TOHP (Lowry, 1999).

So there is a mixture of views based on the recent studies and it is not clear whether

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the use of a particular lecture delivery method is superior to others. Therefore, this study was undertaken to find out students' opinions of the impact of PowerPoint presentations in lectures compared with TOHP and the traditional chalkboard teaching, and compare their effectiveness on the students' performance in the examination.

MATERIAL AND METHODS

A questionnaire based survey of students of second year MBBS receiving lectures using either chalkboard or transparencies and overhead projector (TOHP) or PowerPoint (PPT) presentations was conducted in a private medical college at Jaipur in Rajasthan. After taking permission from the head of the pharmacology department and the principal of the college, IEC approval was taken.

A total of 102 students were allocated to three groups (n = 34), each receiving three lectures by three teachers on different pharmacology topics, using chalkboard, TOHP and the PPT presentation, rotationwise. An objective test comprising of 10 multiple choice questions was given after each lecture to assess their performance and to compare the impact of lecture delivered by three different methods. The students were asked to fill in the questionnaire about their assessment of the impact of three pharmacology lectures delivered by three different methods of lecture delivery, viz. chalkboard, TOHP and the PPT presentation. For each of the lecture given by a different lecture delivery method, the students were asked to grade each of the following parameter out of a maximum mark of 5:

1. The lecture is well organized
2. The lecture is well understandable
3. The board work &/or visual aids are clear
4. The lecture stimulated my interest
5. The lectures advanced my understanding.

Then totaling the above five items, students assessed the overall impact of the lecture out of a maximum mark of 25. Higher the marks, better the assessment.

The average of the students' marks in each of the three groups was taken for finding the final assessment score regarding each of the lecture delivery methods. The difference among the assessment scores of lectures using Blackboard, OHP and PowerPoint was statistically analysed using one-way ANOVA.

The students were also asked to write their comments on the lecture delivery methods. They were also interviewed further in the light of the analysis of questionnaire.

RESULTS

Assessment by the students of the impact of lectures using different teaching aids:

As per the questionnaire filled by the students taking pharmacology lectures delivered by three methods, average scores given by the students to lectures using chalkboard were 21.39024, using TOHP were 19.46341, using PowerPoint were 23.21951 out of a maximum score of 25 (Figure 1). The difference among the assessment scores of lectures using Blackboard, OHP and PowerPoint was statistically highly significant (P value < 0.001). The difference in scores between lectures utilizing Blackboard and OHP is statistically not significant (P value > 0.01). But the difference in scores between lectures using OHP and PowerPoint is statistically highly significant (P value < 0.001). And the difference in the scores between lectures with Blackboard and PowerPoint is statistically significant (P value < 0.01).

Therefore, students preferred lectures with PPT presentations as it was rated with the highest average score and also it contained the least standard deviation in the scores of students, too.

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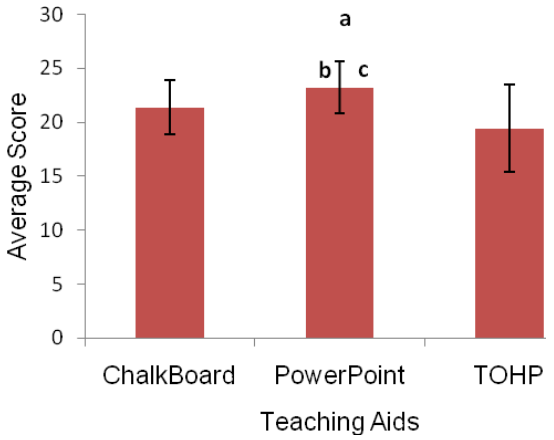

Figure 1: Assessment by the students of the impact of lectures using different teaching aids.
a P < 0.001 among average scores
b P < 0.01 PowerPoint with respect to Chalkboard
c P < 0.001 Powerpoint with respect to TOHP

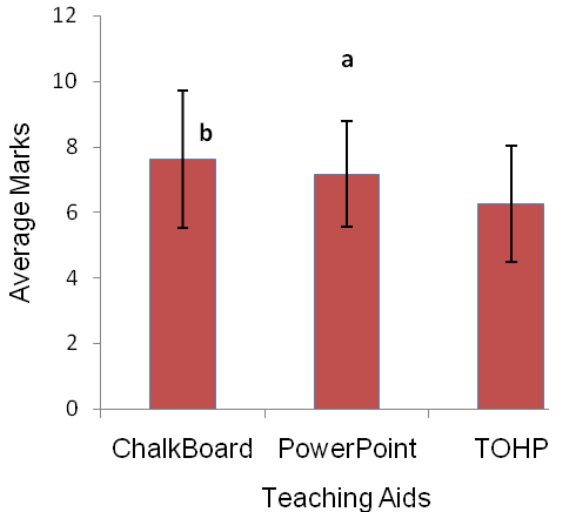

Figure 2: Marks of objective test of students taught using different teaching aids.
a P < 0.01 among average marks
b P < 0.01 Chalkboard with respect to TOHP

Marks of objective test of students taught using different teaching aids:

The average marks of students taught using Blackboard were 7.63414, using OHP were 6.26829 while using PowerPoint were 7.17073, out of maximum marks of 10 (Figure 2). The difference among the average marks of students taught by these three methods was statistically significant (P value < 0.01). Also the marks of students taught by Blackboard were significantly higher than the students taught by TOHP (P value < 0.01). While the difference in marks between lectures using Blackboard and PowerPoint and between OHP and PowerPoint is statistically not significant (P value > 0.01).

An important point noted here was that although the highest average marks obtained were for blackboard teaching, it has much more standard deviation in the marks (2.1066) and has a larger coefficient of variation (27.59 %). In this regard, students' marks were considered better and more consistent with teaching by power point as the standard deviation (1.62638) and coefficient of variation (22.68 %) in this group was the least.

On interviewing the medical students, some valuable practical comments recorded are as follows:

- Several students commented that the effectiveness of the lecture depends upon the teacher, regardless of the method of delivery.
- Students wanted to be able to listen to the lecturer and make their own notes. The most effective lectures were the ones where the students were able to understand and given sufficient time to take down the notes, flow charts and the diagrams.
- In case of traditional lectures using blackboard and chalk, the main reasons for liking was that the lectures contained natural pauses and breaks (e. g. during writing or rubbing the blackboard) allowing students to follow the material. Also it avoids the issue of power failure interrupting the lecture. While the main reasons for disliking were that many times the blackboard was dirty or the chalk was faulty and sometimes the handwriting was not legible. Also it took more time to present the same information as compared to the electronic presentations.
- With the lectures using transparencies and the OHP, the main reason for liking

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was that it is easier to take diagrams, flow charts and notes provided that the handwriting is well legible. Of the presentations that were disliked, the main issues were of poor visibility, poor handwriting, and that the presentation contained too much material and covered too quickly.

- In case of PowerPoint presentations, the main reason for liking was that they avoid the issue of poor handwriting and dirty blackboard. It is more interesting and engaging but the presentations that were disliked, the main reasons were that the presentation contained too much material and the lectures were delivered too fast.

DISCUSSION

The present study was undertaken to determine whether using PowerPoint (PPT) or other such media are superior forms of delivery for lecturing over the traditional 'chalk and talk' or the use of transparencies and an overhead projector (TOHP).

Regarding preference of students for a particular teaching aid we found statistically highly significant result and the order of priority of teaching aids as assessed by the students is: PPT > Chalkboard > TOHP. Though, an earlier study inferred that majority of students' preferred traditional blackboard teaching to TOHP and PPT (Novelli and Fernandes, 2007). Learning with audiovisual aids does seem to have a great impact on students (Sharma et al., 2004).

Our study endorses one finding of a previous study that the students prefer PPT over TOHP, while their observation that the students taught by PPT performed less well on tests as compared to other groups was not in accordance to our study (Bartsch and Cobern, 2003).

As far as the students' performance is concerned, we found a statistically significant result that the order of performance was: Chalkboard > PPT > TOHP. So our finding that the marks of students taught by Blackboard were significantly higher than the students taught by TOHP, does not agree with two of the earlier studies which observed no difference in students' performance in tests who were taught by different methods (Szabo and Hastings, 2000; Shallcross and Harrison, 2007). Another study supports our finding that more students scored higher in objective test with audiovisual aided lectures in comparison to the patient oriented problem solving method of teaching. This is because PPT enhances memory retention and analytical skills, as compared to a traditional lecture. And they recommended combining lectures with Audiovisual aids to improve the intellectual skills and to take away the monotony of lectures (Ernest et al., 1998).

We have noted that the students taught by PPT scored better in examination than those taught by TOHP, although the difference is not statistically significant. Similarly, in another study there was marked improvement in examination results when PPT replaced the use of TOHP (Lowry, 1999).

In the opinion of some students the effectiveness of the lecture depends upon the teacher and in this context, a study points out that a good teacher knows to start at a basic point of the course, which students can understand and then lead them gradually through the new and more difficult points (Shallcross and Harrison, 2007).

In our interview we noted students' opinion that the main reasons for liking lectures using blackboard was that the it contained natural pauses and breaks (e. g. during writing or rubbing the blackboard) allowing students to follow the material and take down the notes. In this context, a chalkboard may be said to be more student centered while PPT is more teacher centered (Creed, 1998). A chalkboard allows spontaneity, flexibility and non linearity. Also it does not get affected by broken glass (TOHP), power-loss (PPT & TOHP) and can be used with lights on (Estes et al., 2009).

With the lectures using transparencies and the OHP, the main reason for liking was that it is easier to take notes provided

the handwriting is well legible. Of the presentations that were disliked, the main issues were of poor visibility and that the presentation contained too much material and covered too quickly. It is explained in an article that although the OHP is easy to use and has some advantages, at times it can serve as a distraction (Shah, 2006).

In case of PPT presentations, the main reason for liking was that they avoided the issue of poor handwriting and dirty blackboard. It is more interesting and engaging. The main reasons of disliking were that some presentations contained too much material and the lectures were delivered too fast. A study has pointed out that in PowerPoint the ability to integrate the text and the pictures and images is a great advantage and improves the educative value of the subject (Mayer and Anderson, 1992). One disadvantage of PPT seems to be that the student becomes a passive observer rather than an active participant (Casanova and Casanova, 1991). It is suggested that although PPT has some positive effects, but it reduces the interactive discussion between teacher and students (Garg et al., 2004). Some have argued that PPT encourages active learning environment, increase effectiveness of lectures and lend clarity to the subject (Hunt, 1998; Sammons, 1997; Rossen et al., 1997) and the use of PowerPoint can help teachers to "help their students learn" (Rocklin, 1998).

Audiovisual aids should be used to enhance and complement the lectures. The whole exercise should motivate, enthuse, encourage the students to think and not overload them.

CONCLUSION

Students preferred PowerPoint teaching as evidenced by the subjective assessment of the students. As far as the objective assessment of students' performance is concerned the impact of traditional Chalkboard teaching and PowerPoint presentation was much more than the lectures using transparency and OHP.

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