

PowerPoint versus Chalkboard Based Lectures in Pharmacology: Evaluation of Their Impact on Medical Student's Knowledge and Their Preferences

Sunita B. deSa¹, Mukundraj S. Keny²

¹Assistant Professor, ²Postgraduate Student

^{1,2}Department of Pharmacology, Goa Medical College, Bambolim, Goa-403202, India.

Corresponding Author: Dr. Mukundraj S Keny, Department of Pharmacology, Goa Medical College, Bambolim, Goa-403202, India. **E-mail:** mukundkeny@yahoo.com

Abstract

Introduction: Teaching aids like chalkboard, PowerPoint (PPT) etc. have been used in pharmacology teaching but the superiority of these aids over one another has not been proven. The present study was conducted to evaluate the impact of the PPT and chalkboard based lectures in pharmacology teaching on medical students.

Material and methods: A cross-sectional study was conducted at Department of Pharmacology, Goa Medical College, Bambolim, Goa, India in 2012. Eighty three medical students were randomly divided into two groups and a selected content-based lecture was delivered. For one group lecture was delivered using chalkboard, for second group using PPT presentation. Single-best Multiple Choice Questions [MCQs] paper was used for assessing the knowledge gained. One direct question to note student preferences for these aids was included on the MCQ paper. The difference in the marks obtained in the two groups was analyzed by independent student's t test.

Results: Students who attended the class using chalkboard obtained significantly higher score in MCQ test compared to those who attended the same content based lecture using PowerPoint ($p < 0.001$). The chalkboard lectures were preferred by 67.5% of the students.

Conclusion: The results of the present study suggest that chalkboard teaching has the advantage of a better recall besides being the most preferred aid among second year medical students.

Keyword: Chalkboard, Lectures, Pharmacology, PowerPoint, Teaching aids

Introduction:

Pharmacology is a rapidly changing medical science which trains a medical student to use drugs rationally in treating patients. Pharmacology is considered to be a boring subject as it becomes very difficult for students to memorize the increasing knowledge in this field. The main aim of teaching in pharmacology is to make students understand the drug effects in such a way that they find the subject interesting and at the same time retain this knowledge when they treat patients. With increasing number of medical seats and syllabus, there has been a constant effort to use modern teaching aids in medical colleges.

Audiovisual aids (like PowerPoint (PPT)) help to illustrate pathway and mechanism diagrams and impart clarity to the lectures.

Chalkboard aid is inexpensive; easy to clean and reuse, allows students to keep pace with the teacher and is not dependent on electricity. But it is time consuming; one cannot go back to what has been erased and is not so effective for large number of students. PPT has the advantage of using colors, fonts, diagrams and animation. Its disadvantage is that dim light causes loss of eye contact; note taking is difficult, has tendency to overload information and needs electricity.

One viewpoint is that using PPT improves learning or comprehension whereas other viewpoint states that students remember about the same amount of material following PPT as they do following other media (such as overheads and blackboard). Some studies find that PPT actually impairs learning.¹ Hence several student feedback studies have been conducted in the past in the field of medical education. The superiority of PPT with respect to the traditional chalk and talk method has not been proven.

The Goa Medical College (GMC) situated in Bambolim, Goa, India (the only medical college in the state) is recognized by the Medical Council of India (MCI) for annual intake of 150 MBBS students. In our institute, chalkboard/ overhead projector lectures remain the most common teaching aid. Since 2007, each department in our college has slowly introduced PPT based lectures as a teaching aid. In department of pharmacology, the PPT based teaching started in the year 2010. There is a need to evaluate the impact of this change on the knowledge gained by students.

Therefore, the present study was planned in GMC to compare the impact of the PPT and chalkboard in pharmacology teaching by assessing the knowledge based on the marks obtained and studying student preferences for these aids. Although studies related to medical education have been conducted in Goa, study of this nature has been carried out in Goa for the first time.

Materials and methods:

This cross-sectional study was conducted in the Department of Pharmacology, Goa Medical College in 2012. The study was approved by the Institutional Ethics Committee. A total of 83 medical students who were about to complete their second year MBBS were included in this study. A selected content based lecture in pharmacology was delivered in two different lecture halls at the same time. The students were randomly divided into two groups based on odd/even roll numbers. Even roll numbers formed Group I and Odd roll numbers formed Group II. For Group I lecture was delivered using the chalkboard [n = 42] and for Group II using the PPT [n = 41]. The time allocated for the lecture in both groups was equal (1 hour). Immediately after the lecture a single best

multiple choice questions (MCQs) paper consisting of 10 questions was distributed and students were asked to attempt all the MCQs within the required time. Each question carried one mark. In addition there was one direct question on whether students would prefer PPT or blackboard for lectures in pharmacology. The marks obtained (out of 10) were calculated for each student. The difference in the marks obtained in the two groups was analyzed by independent student's t test using the Statistical Package for Social Sciences (SPSS) version 17. The level of statistical significance was considered at p-value less than 0.01. The preference of students for the teaching aids was evaluated in the form of percentages.

Results:

Table No. 1 shows the comparison of marks obtained by the students using the two teaching aids. Significantly higher marks were obtained by students who were taught using chalkboard compared to those students who were taught using PPT. 67.5% (56) of the students preferred chalkboard (27) whereas 32.5% of the students preferred PPT. (**Figure No. 1**)

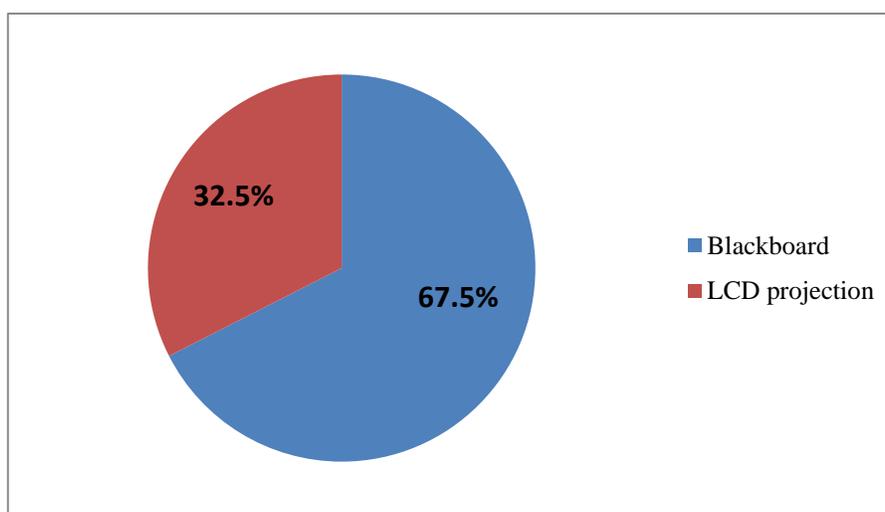
Discussion:

Every lecture topic has some specific facts which the student should retain in his memory. These help them later to develop new knowledge. It is the duty of the teacher to emphasize these facts during the lecture. Use of teaching media plays an important role in this aspect. The type of media used will decide how much attention will be obtained during the lecture thereby influencing the knowledge retained.

In this study, it was observed that the short term retention of facts was less with PPT and hence students in PPT group obtained lower scores. Also more number of students preferred chalkboard (67.5%) over PPT (32.5%). This study has been specifically conducted to evaluate the use of teaching aids in pharmacology. The findings obtained may not be true for all subjects in medical curriculum. The preference of students for these two teaching aids may vary from subject to subject and also influenced by the commonest mode of teaching aid used in that department.

Table No. 1: Comparison of Marks Obtained by the Students in the Two Groups

Parameter	Chalkboard (Mean \pm SD) (n=42)	PPT (Mean \pm SD) (n=41)	Significance level
Marks obtained	8.55 \pm 1.34	7.05 \pm 1.59	p value<0.001
SD=Standard deviation			

Figure No. 1: Preference of Students for Teaching Aids

The main reasons for liking chalkboard could be that it allows sufficient time to take down notes and power failure does not interrupt the lecture. The main reasons for disliking PPT are that it takes longer to set up the projection, power failure interrupts the lecture and students find it difficult to take down the notes. Also the students could be more impressed by the way chalkboard is used as compared to PPT.

Several studies in the past have found chalkboard to be a better method of teaching. A questionnaire-based study carried out among 7th semester medical students in Delhi rated chalkboard as best in allowing interaction and helping recall.² A study conducted by Banerjee *et al.* Nepal in 2008-2009 reported that chalkboard methodology was found to

be the best (60%) followed by LCD Slides (20%).³ Another study conducted in West Bengal in 2012 concluded that chalkboard was better than PPT according to the second year MBBS students.⁴ A study conducted in 2012 in Goa Medical College to evaluate the learning environment of undergraduate medical students included 387 students from different semesters. Most of the students (66.9%) thought multimedia to be the most effective teaching tool followed by traditional blackboard.⁵ But this study provided a general opinion on teaching of all medical subjects and not a specific field like pharmacology. In a study undertaken to elicit the perception of the 337 MBBS students of different semesters in Orissa in 2013 regarding the teaching methods concluded that

82.83% of the participants agreed that chalkboard teaching is a better mode of teaching.⁶

Some studies also support the use of PPT over chalkboard. A study conducted in USA on engineering students retained 15% less information delivered verbally by the lecturer during PowerPoint presentations, but they preferred PowerPoint presentations over traditional presentations.^[7] But in our study more students preferred chalkboard and even the memory retention was better with chalkboard. A study conducted on 62 medical students in Jaipur India concluded that 65 % of medical students preferred the use of PPT presentations significantly over other methods.⁸

In one study in USA, medical students rated both types of presentation equally and displayed no differences in short- or long-term retention of material.⁹ Another study conducted on 93 fifth semester medical students in Gujarat showed that the student had equal liking for both these teaching aids.¹⁰ Recent studies conducted in India reported that combination of teaching aids (e.g. chalkboard and PPT) is the best method of teaching.^{11,12} But in our college we don't use combination aids so frequently and hence we didn't include combination aids as one of the comparative arms.

Studies conducted in developed countries may show a preference for PPT because they are technologically more advanced. The students are taught using these technologies much before they enter professional colleges. In India most of students are used to chalkboard type of teaching before they enter professional colleges. The inadequate back up facilities for PPT presentation hamper their use in some colleges. Also the medical college faculty may not be adequately trained in use of laptop and audiovisual aids.

Besides conducting student feedback studies, it is important that there is a discussion on teaching aid use in lectures among senior faculty members of all departments. It is not necessary that all topics be covered using PPT. Depending on the subject and the topic the aid has to be selected.

Conclusion:

The results of the present study suggest that chalkboard has the advantage of a better recall besides being the most preferred aid among medical students. There is a need to discuss as to why a traditional method has more preference over a new method. This study should be considered as a guide by all streams of medicine to improve the use of PPT and to consider it a supplement to the chalkboard teaching.

References:

1. Kosslyn SM, Kievit RA, Russell AG, Shephard JM. PowerPoint Presentation Flaws and Failures: A Psychological Analysis. *Front Psychol.* 2012 July 17;3:230.
2. Dhaliwal U. A prospective study of medical students' perspective of teaching-learning media: reiterating the importance of feedback. *J Indian Med Assoc.* 2007;105(11):621-3.
3. Banerjee I, Jauhari A C, Bista D, Johorey A C, Roy B, Sathian B. Medical Students View about the Integrated MBBS Course: A Questionnaire Based Cross-sectional Survey from a Medical College of Kathmandu Valley. *Nep J Epidemiol.* 2011;1(3):95-100.
4. Bandyopadhyay D. A study on the evaluation of perception of teaching-learning methods of pharmacology among the 2nd MBBS students in Burdwan Medical College, West Bengal, India. *Rev Prog.* 2013. Available from: <http://reviewsofprogress.org/ArchiveArticleList.aspx?Issue=12>.
5. D'souza D. Evaluation of undergraduate medical students learning environment in Goa: A cross sectional study. *Int J Med Res Health Sci.* 2013;2(3):357-62.
6. Kumar Dash S, Patro S, Behera B. Teaching Methods and Its Efficacy- An Evaluation by the Students. *J Indian Acad Forensic Med.* 2013;35(4):321-4.
7. Savoy A, Proctor RW, Salvendy G. Information retention from PowerPoint and traditional lectures. *Comput Educ.* 2009;52(4):858-67.
8. Seth V, Upadhyaya P, Ahmad M, Moghe V. PowerPoint or chalk and talk: perceptions of

- medical students versus dental students in a medical college in India. *Adv Med Educ Pract.* 2010 Aug;1:11-6.
9. Ricer RE, Filak AT, Short J. Does a high tech (computerized, animated, PowerPoint) presentation increase retention of material compared to a low tech (black on clear overheads) presentation? *Teach Learn Med.* 2005;17(2):107-11
 10. Baxi SN, Shah C J, Parmar RD, Parmar D, Tripathi CB. Student's perception of different teaching aids in a medical college. *Afr J Health Prof Educ.* 2009;1(1):15-6.
 11. Kumar A, Singh R, Mohan L, K K Mani. Student's views on audio visual aids used during didactic lectures in a medical college. *Asian J Med Sci.* 2013;4(2):36-40.
 12. Mohan L, Sankar P R, Kamath A, Manish M S, Eesha B R. Students' attitudes towards the use of audio-visual aids during didactic lecture in pharmacology. *J Clin Diagn Res.* 2010; 4(6):3363-8.

How to Cite: deSa SB, Keny MS. PowerPoint versus Chalkboard Based Lectures in Pharmacology: Evaluation of Their Impact on Medical Student's Knowledge and Their Preferences. *Int J Adv Health Sci* 2014; 1(5): 10-14.