

RESEARCH ARTICLE

Multimedia teaching helps in better recall of physiological concepts – Perception of the first year medical students in a South Indian medical college

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ABSTRACT

Background: Learning physiology has always been a challenge among the 1st year MBBS students. More challenging is to understand the concepts of various physiological events. Traditional teaching methods like didactic lectures set in a sense of boredom over a period of time and lead to lack of attention to lectures. **Aim and Objective:** The aim of this study was to redesign the regular didactic lecture classes by incorporating audio-visual demonstrations, animations related to the lecture topic, and then to test students' recall of material presented to them through multimedia presentations. **Materials and Methods:** A total of 138 1st year MBBS students participated in this study. A questionnaire was administered seeking the student's perceptions on the use of multimedia in better understanding and recall of the study material. A post multimedia lecture assessment was conducted to test their recalling ability. **Results:** Perceptions of 136 students (98.55%) were that multimedia lecture class is a useful method to be attentive and hence enables to understand important points of the lecture and later recollect the material in a better way, which was also evidenced by their performance on the post multimedia lecture test, which showed significant results with an overall mean score in post multimedia lecture test (4.42 marks of 5 marks). **Conclusion:** Since visual media and technology have become a part and parcel of the current generation, it is inevitable in medical education too.


KEY WORDS: Multimedia; Didactic Lecture; Physiology

INTRODUCTION

Didactic lecture classes are mostly unidirectional where teachers talk and students listen, a passive way of learning which is predominant in medical teaching. Studies by Bonwell and Eison suggest that "the exclusive use of the lectures in

the classroom constraints student's learning.¹ Studies by Penner, Verner and Dickinson also show that students lose their concentration after 15–20 min of the lectures.^{2,3} Joyner and Young suggest that by integrating experiential learning activities in the classroom, students' interest in the subject matter and understanding of course content can be increased.⁴ Learning with audio-visual aids does seem to have a great impact on students⁵ according to Sharma *et al.* Studies (Dirk, 2011) suggest using media engage students, aid student retention of knowledge, motivate interest in the subject matter, and illustrate the relevance of many concepts.⁶

The intention of the present study is to convert the regular didactic lecture class into an active learning process,

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interesting for the students by incorporating videos showing different clinical signs pertaining to the applied aspects of the lecture topic concerned and animations explaining the physiological concepts of the topic.

MATERIALS AND METHODS

This cross-sectional study was conducted in a city medical college in Tamil Nadu. The study subjects were 138 1st year MBBS students, of which 68 were male and 70 were female. Informed consent was obtained from all the student participants.

Lecture class was designed by carefully incorporating multimedia consisting of relevant animations, video recordings explaining the concepts, and case scenarios and presented to the 1st year MBBS students.

A validated questionnaire [Table 1] with Likert's scoring scale was administered seeking the perceptions of the students on the use of multimedia in teaching physiology and whether it enhances their attention span to the lecture class and in better learning and recollecting subject matter. A post multimedia lecture objective type assessment was conducted. Data were analyzed.

RESULTS

The use of multimedia in teaching physiology is increasing the attention span as it was perceived positively by 136 students (98.55%). One hundred and thirty-five of 138 students (97.82%) agreed strongly that video clippings of physiological events were very useful in understanding the concepts better. One hundred and thirty-five (97.82%) students were of the opinion that video classes helped them recollect the subject easily during assessment. The mean score of the post multimedia lecture was 4.42 of 5 which also establish the fact that this teaching method improves the attentiveness of the students and also in their recalling capacity during the assessment. Female students have scored higher marks than the male students though not statistically significant [Table 2].

Results expressed as the number of students ($n = 138$) and percentage of students (in brackets) who gave a particular response on a 5-point Likert scale to each of the 4 items of the questionnaire [Table 3].

About 87.68% of students (121/138) preferred multimedia incorporated lectures as their choice over the other modes of teaching physiology [Table 4].

DISCUSSION

The study was aimed to analyze the perceptions of the 1st year medical students about the usefulness of multimedia

Table 1: Questionnaire on perceptions of medical students regarding the use of multimedia in learning physiology

Questionnaire

1. Multimedia teaching increases attention span to the lecture session.
2. Multimedia teaching helps in better understanding of the physiological concepts.
3. Multimedia teaching helps in better recollection of the subject matter during subsequent assessment.
4. Multimedia teaching is a distraction to the lecture topic.
5. Which of the following methods of teaching do you prefer?
 - (a) Self-directed learning
 - (b) Small-group discussions
 - (c) Didactic lectures alone (chalk and board)
 - (d) PowerPoint presentations alone
 - (e) Multimedia teaching (PPTs incorporating audio-visual aids, animations, etc.).

Table 2: Post multimedia lecture test mean scores of the male and female subjects

Mean score ($n=138$)	Male students ($n=68$)	Female students ($n=70$)
4.42	4.40	4.44

lecture sessions in better understanding of physiological concepts and its application and whether it helps them in better recall of learned material during assessments. To summarize the findings of the study, majority of the study participants have benefitted from the multimedia incorporated lecture session which was evident from their positive responses that their attention span had increased during the multimedia lecture session and it also enhanced better understanding of physiological concepts and helped in better recall of the learned concepts during assessment. The positive impact of the intervention was evident through the high scores in the post multimedia assessment.

About 97.82% of our study participants agreed strongly that video clippings of physiological events were very useful in understanding the concepts better which was also established by studies by Gavriel as "people learn abstract, new and novel concepts more easily when they are presented in both verbal and visual form."^[7]

About 97.82% of students were of the opinion that video classes helped them recollect the subject easily during assessment. This is similar to findings by Cowen and Willingham who say visual media also make concepts more accessible to a person than text alone, promote deep learning rather than rote learning, and help with later recall.^[8,9]

About 87.68% of students opted for multimedia incorporated lectures as their preference over the other choices [Table 4]. Neetha *et al.* in their study have recorded video lectures as a second choice as preferred mode of teaching behind bedside teaching since it was for practicals.^[10]

Table 3: Responses of students to individual items of the questionnaire on the use of multimedia in learning physiology

Variable	Strongly agree (%)	Agree (%)	Total (Strongly agree+agree) (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
Increases attention span to lecture	89 (64.49)	47 (34.05)	136 (98.55)	1 (0.72)	1 (0.72)	0
Better understanding of the concepts	75 (54.34)	60 (43.47)	135 (97.82)	3 (2.17)	0	0
Better recollection of the subject during tests	116 (84.05)	19 (13.76)	135 (97.82)	3 (2.17)	0	0
Distraction to the lecture	0	1 (0.72)	1 (0.72)	7 (5.07)	54 (39.13)	76 (55.07)

Table 4: Responses of students to the open-ended questionnaire on their preference of teaching physiology

Self-directed learning	Small-group discussion	Didactic lecture	PowerPoint presentation	Multimedia teaching
4 (2.89%)	13 (9.42%)	-	-	121 (87.68%)

Limitations of the Study

The strength of our study is the positive perceptions of majority of the participants as this multimedia incorporated lecture can effectively cater to a learner-centered teaching-learning method. Still, the result reflects the perceptions of students for the study sessions only and in one institution. It can be documented across many such sessions to test the significance.

CONCLUSION

Understanding the basic physiological concepts is very much essential to build on further knowledge in the field of medicine. Hence, the mode of teaching should also cater to the students in such a way that they understand the concepts clearly so that they can recall easily during their assessments. The results of our study clearly indicate that medical students prefer multimedia incorporated lecture classes to traditional lectures. As visual media and technology have become a part and parcel of the current generation, it is inevitable in medical education too.

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