

Medical Education

To play or pause: Video-based or conventional lectures in medical classrooms

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ABSTRACT

Objectives: Medical knowledge has increased by leaps and bounds over the past century, but our teaching-learning methods remain archaic, lecturing being one of the oldest. This study was conducted to assess the change in knowledge following a conventional lecture and that following a video-based lecture using a medical television (TV) serial.

Material and Methods: The students were divided into two groups based on their registration numbers. To one group, a video-based lecture using appropriate clips from a medical TV serial was administered while the other group was taught the same topic using conventional teaching-learning method of a lecture. A pre-test and a post-test were conducted and the change in the results compared.

Results: The mean pre-test scores were higher in the successively senior batches of students as compared to the junior batches in both groups. The post-test scores were significantly higher in both the conventional lecture and the video group. Surprisingly, the mean post-test scores in the conventional lecture group were significantly higher than that of video-based lecture group. Students preferred the video-based lecture more than the conventional lecture.

Conclusion: Both teaching learning methods have their own advantages. The conventional lecture uses an outcome-oriented session while the video-based sessions do not. The soft skills like breaking bad news, doctor patient communication skills etc which we never teach in conventional lectures can be learnt using these video-based sessions. Thus, we need a blended approach here as well, utilising the strengths of each of the teaching learning methods so that our students can achieve the laid down competencies.

Keywords: Conventional lecture, Video-based lecture, Teaching-learning method, Blended learning

INTRODUCTION

Lecturing is as old as time! Despite the availability of newer teaching-learning methods, we use such ancient methods many a time. The main advantage of lecturing is that a large number of students can be taught at the same time. However, lecturing as a teaching-learning method is far from ideal.^[1,2] The above fact is taken further by the Cleveland Clinic, Lerner College of Medicine of Case Western Reserve University, which has had a “no lecture” education philosophy since its inception in 2004.^[3] University regulations in many countries require a minimum attendance for theory classes to be eligible to appear for the final examinations. Students in such classes may be physically present but “mentally absent” thus impeding their learning. Thus, a “stickier” model of learning needs to be implemented as Prober and Heath^[4] proposed in 2012.

Dale’s cone of learning outcomes says that active participation of students leads to better and more effective learning. The more the participation from the students’ side, more is their ability

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to analyse, evaluate, create and apply in practice. Experts suggest incorporating newer, comprehensive methods, to help students understand the topic better. The contemporary lecture was found to be helping students to retain more information. Thus, choosing the method to be used for a particular topic is very important as this is going to influence the understanding of the students and improve their learning abilities. Selecting a suitable teaching-learning method depends on the topic itself, the students' knowledge and the expectations from the student after learning the topic^[5] as one size does not fit all.

This study was conducted with the following objectives:

- To assess the change in knowledge following a conventional lecture and that following a video-based lecture
- To compare the above two parameters to find out if either one teaching-learning method was better
- To assess the knowledge retained after a month following the conventional lecture and that following a video-based lecture.

MATERIALS AND METHODS

The study was conducted in a tertiary care, medical college in South India among the consenting medical students in their clinical years of training. The Institutional Review Board clearance was obtained before the start of the study. Informed consent was taken from the participants before the initiation of the programme. In a quasi-experimental study design, all the consenting students of the final year, 4th year and 3rd year batches were divided into two groups based on their registration numbers. Odd numbers formed one group and even numbers the other. To one group, a video-based lecture (not a video recorded class) about neonatal sepsis using an appropriate clip lasting about 35 min from a medical television (TV) serial available on YouTube[®] was conducted with the teacher adding on information to the video when needed. The other group was taught neonatal sepsis using a conventional lecture with the same teacher conducting both the sessions one after another. Sixty minutes were allocated for each session. Doing this gave no chance to the students to interact amongst each other, which otherwise may have led to contamination of the results. A pre-test and a post-test were conducted and the change in the results was compared. For assessing the retention of the subject taught, another post-test was carried out after 1 month in both the groups and the results analysed. All the three tests conducted had the same set of 40 multiple-choice questions with a single best response. These were first given to five internal and five external subject experts. Their suggested changes were incorporated and pilot testing was done on 30 students and evaluated. Confounders were addressed and then the test was finally administered. After each teaching learning session, feedback from both the groups was taken using a

questionnaire comprising 10 questions about the session with a total maximum score of 50 as per the Likert scale. The scores obtained in the feedback forms were analysed by the Mann–Whitney U-test to test the significance of this difference of scores.

The collected data were entered into Microsoft Excel and analysed using a paired *t*-test to assess the change in scores in each group comparing the pre- and post-test scores and also for the retention of the topic taught after a month. The mean scores of the lecture and video-based lecture group for pre- and post-tests and also the results obtained after a month of teaching to assess retention were compared. The statistical significance of this score difference was tested by unpaired *t*-test. The results of each batch were assessed independently.

RESULTS

A total of 217 consenting MBBS students participated in the study belonging to the final year, 4th year and 3rd year batches. One hundred and eleven were allocated to the conventional lecture group and 106 in the video group. The mean pre-test scores were higher in the successively senior batches of students as compared to the junior batches, as represented in [Table 1]. The mean pre- and post-test scores were 5.7, 8.4 and 10.86 and 17.38, 21.06 and 25.46 in the 3rd year, 4th year and final year batches, respectively, for the conventional lecture. For the video group, their mean scores for the pre- and post-tests were 6.87, 7.65 and 10.89 and 14.73, 13.23 and 20.91, respectively. As expected, the gain in knowledge was highly significant in both groups irrespective of the teaching-learning method. An important observation was that the conventional lecture group consistently scored higher than the video group across all batches. The difference between the post-test scores across batches was statistically significant, implying that the students who were exposed to the conventional lecture scored significantly higher in the post-test as compared to the video-based lecture.

[Tables 2 and 3] show the comparison between the post-test score and the revision post-test conducted after a month. The mean scores showed a significant decline in knowledge after 1 month irrespective of the teaching method used. The decline in the mean scores being about 42.63% lower than their previous post-test scores while that of the video group was lesser with an average decline of 28.17%, showing better retention in the video group.

The mean feedback score for the conventional lecture group was 32.86 as compared to the video-based lecture group which had a mean score of 43.16. The Mann–Whitney U-test was done to assess the feedback scores between the two groups. The students preferred the video-based lecture over conventional lecture and the score difference was statistically highly significant.

Table 1: Comparison of pre-test and post-test scores of conventional and video-based lecture groups of each batch.

Batch	Conventional lecture				Video-based lecture group			
	Pre-test		Post-test	“P” value	Pre-test		Post-test	“P” value
	Number	Mean score±SD	Mean score±SD		Number	Mean score±SD	Mean score±SD	
Final year	36	10.86±5.83	25.46±5.2	<0.001	38	10.89±5.47	20.91±4.58	<0.001
4 th year	35	8.4±2.83	21.06±6.96	<0.001	31	7.65±3.24	13.23±5.28	<0.001
3 rd year	40	5.7±2.75	17.38±6.22	<0.001	37	6.87±2.85	14.73±3.83	<0.001
All batches	111	8.23±4.54	21.16±6.97	<0.001	106	8.53±4.42	16.51±5.63	<0.001

Table 2: Comparison of post-test and revision post-test scores of both groups for each batch.

Batch	Conventional lecture				Video-based lecture group			
	Post-test		Revision post-test	“P” value	Post-test		Revision post-test	“P” value
	Number	Mean score±SD	Mean score±SD		Number	Mean score±SD	Mean score±SD	
Final year	21	25.6±5.61	16.14±6.51	<0.001	18	21.03±4.37	15.83±5.69	<0.001
4 th year	27	22.3±4.89	12.78±4.07	<0.001	19	15.74±4.41	11.26±4.81	<0.001
3 rd year	14	17.36±5.67	9±6.26	<0.001	15	14.27±4.23	9.6±4.1	<0.001
All batches	62	22.3±6.06	13.07±6.03	<0.001	52	17.14±5.16	12.37±5.52	<0.001

Table 3: Comparison of the mean % difference in scores of post-test and revision post-test scores for assessing retention of knowledge.

Batch	Conventional lecture		Video-based lecture group		“P” value
	Number	Mean % of difference±SD	Number	Mean % of difference±SD	
Final year	21	39.05±18.92	18	25±23.66	0.046
4 th year	27	41.63±18.34	19	27.45±22.72	0.024
3 rd year	14	49.93±22.07	15	32.8±30.97	0.1
All batches	62	42.63±19.52	52	28.17±25.34	0.001

DISCUSSION

In 1994, “cinemeducation” came into existence, where movies on videotape were used to educate family practice residents concerning the psychosocial aspects of medical care.^[6] Since 1994, technology also has evolved in a big way and more and more videos using the “creative commons” license and “fair use” guidelines on YouTube* are available for teaching medical students and postgraduate residents. The powerful impact of a video in learning in imprinting images in our mind is unparalleled. Now, with a lot of medical material available and with excellent projection and audio systems, these clips can be shown to a class to help enhance learning.

TV and video viewing interests a majority of students as compared to lectures.^[7,8] Using these media could make a big difference in learning.^[7-12] Videos used in medicine are primarily for demonstrating procedures, surgical interventions and learning based on the affective domain in medicine. We presume that video-based lectures would evoke students interest causing better retention of knowledge and being problem-based would help them achieve the necessary competencies.

Hence, would video-based lectures help in solving many problems in the teaching-learning process? Is it the panacea that we are looking for? Unfortunately, No! In a study on the utilisation of lecture videos by medical students in the Stritch School of Medicine, Loyola University Chicago, Maywood, IL, USA, it was found that a majority of students did not access the available videos. In contrast, a few students did access the videos in the areas that they found difficult to understand.^[13] Lord Alfred Tennyson writes, in, “The passing of Arthur” – “The old order changeth, yielding place to new;” similarly, we should be ready to change our teaching-learning methods with changing times and think out of the box to make our learning more effective.

Conventional lecture-based learning or didactic instruction has been and is still practised as the cornerstone of medical education, which is a teacher-centred activity. The teacher delivers the instruction to a passive audience of students who may or may not attentively listen and only very few respond. The content is derived from textbooks and theoretical examinations are the typical mode of assessment^[14] after such a session.

Globally and locally, medical education is moving toward implementing competency-based medical education

(CBME).^[15] However, this is easier said than done. CBME requires the active involvement of medical teachers who are not only highly competent but also have exposure to the newer methods in Medical Education Technology for example, e-learning and its many platforms even those including virtual reality.^[16] In the direction of ensuring uniform standards in the teaching-learning process, technological innovations have come to help greatly.^[17] Video-based learning is one such method. The use of well-researched and professionally created videos provides engaging learning experiences.^[18] Videos put the point across in a transparent manner with both a short as well long-term impact.

After the advent of the digital age and especially after high-speed internet became widely available and affordable on mobile devices, videos have become a very predominant medium of communication. Several articles have highlighted the use of videos in medical education. Hye Won Jang and Kyong-Jee Kim studied the use of online clinical videos for clinical skills training of medical students.^[19] They confirmed the overall positive impact of OSCE videos on students' learning of clinical skills. Larry Hurtubise *et al.* have elaborated on how videos can be leveraged in medical education.^[20] Damian Roland and Thomas Balslev have highlighted the use of case videos.^[21] Thus, there is no doubt about the utility of educational videos, provided that they are professionally created and the message is appropriately delivered.

There is no similar study published which has used an established medical TV serial for teaching and assessing cognitive knowledge improvement, but there are several studies that have used video-based lectures as a method of instruction. Our results were comparable to similar such studies using video-based lectures. Nikopoulou-Smyrni and Nikopoulos^[9] in their study on evaluating the impact of video-based versus traditional lectures on student learning found that lectures using video clippings had a better impact on the students soon after the class which was dissimilar from my findings as the immediate improvement in knowledge was better in the conventional lecture. However, the findings at follow-up assessments at week 1, 2 and 3 and our results at the end of a month reinforced the findings in the study conducted by me that the retaining of knowledge gained was better in the video-based group as compared to the conventional lecture. The probable reason for the former may be the fact that in conventional teaching we usually employ an outcome-oriented session where the probable questions that may be asked from the topic are stressed upon, often many a time, during the lecture which would not be the case in a video-based lecture where the content is not created by us. The use of videos in medical education has a promising role as far as the long-term impact is considered and also with generating more interest in the students.

Hence, if the impact of video-based lectures is better than conventional lectures, should it not be used more in medical education? This question is especially relevant in the present-day medical education scenario in India, where the number of students is increasing and the number of faculty needed per student decreasing. One of the main questions our study asked was as to which method of teaching-learning would be more effective in improving knowledge both in the short term and in the relatively long term with feedback from the students about the method of instruction that they preferred.

Lectures remain as the most used method in medical education considering the utilisation of faculty time and resources.^[21] The introduction of audio-visual aids, especially something like a video which would keep them interested would help bring about much change to a conventional lecture class. The present conventional lectures do not need to be replaced but need to be complemented with video-based lectures. These video-based lectures are highly preferred by students as well.

Students who were in the senior years consistently scored higher marks than the juniors implying a possible improvement in understanding of the subject with each passing year of medical training. Both teaching-learning methods did help improve scores in the short term. A significant decline in knowledge after 1 month was noted irrespective of teaching method used, but the video-based method helped the students remember better at the end of 1 month probably suggesting that the video-based lecture method may be better for long-term retention of the topic taught. Our students chose the video-based lecture over conventional lecture as their preferred teaching-learning method.

Videos are a powerful teaching and learning tool because it can influence knowledge, skills and attitude formation effectively and reach learners with various learning and communication styles.^[20] Videos have been usually used to teach psychomotor skills,^[22,23] communication skills^[24] and handling specific situational simulated scenarios like breaking bad news^[25] among others. However, there is more than can be done. Creating factually correct medical content may be the future which would help better long-term recall, improved interest and a better understanding of the subject. One of the limitations of our study was that it measured only the change in cognitive knowledge. An assessment of the change in the psychomotor or affective domain would have given us much more information.

CONCLUSION

Both, video-based and conventional lectures have their own advantages and are effective teaching learning methods. The conventional lecture uses an outcome-oriented session which reflects in the higher scores. Soft skills, like, breaking

bad news, doctor patient communication skills etc can be imparted using these video-based sessions. A blended approach, which utilises the strengths of each teaching learning method, should be implemented so that our students achieve the laid down competencies.

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Declaration of patient consent

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Conflicts of interest

There are no conflicts of interest.

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