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Original Article

Education Section

Effectiveness of Recorded Video Lectures vs Live Online Lectures as Teaching Tools among Phase 1 Medical Students- A Prospective Study

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ABSTRACT

Introduction: During the pandemic, there were a lot of challenges for offline medical education. To overcome those challenges, online teaching methods were introduced for undergraduate medical education. Live online lectures (synchronous teaching) and recorded video lectures (asynchronous teaching) were the two commonly utilised teaching mediums of online education.

Aim: To determine the effectiveness of recorded video lectures versus live online lectures and to analyse the students' perception regarding these two teaching methods.

Materials and Methods: The present prospective interventional study was conducted in the Department of Physiology at Sree Gokulam Medical College and Research Foundation, Venjaramoodu, Trivandrum, Kerala, India. The duration of the study was six months, from March 2021-August 2021. A total of 150 students (97 girls and 53 boys) in two groups of 75 each were selected as study population and four topics were taught to them. If, one group was taught via live online lecture, the same topic was given as a recorded video to the other group and after three days, an assessment was done. For the second topic, the method of lecture delivery was changed between the groups, while the rest of the methodology was the same. Topics 3 and 4 followed same pattern. Unpaired t-test was done to compare the scores and the data was analysed using Statistical Package for Social Sciences (SPSS) version 21.0.

Results: The mean age of the study participants was 18.5 years. The results showed that, the recorded video lectures were equally effective as live online lectures. While analysing the students' perception, it showed that students, to an extent, preferred recorded lectures to live lectures.

Conclusion: The present study concluded that, the recorded video lectures are equally effective as live online lectures as a teaching tool, among phase 1 Bachelor of Medicine and Bachelor of Science (MBBS) students.

Keywords: Asynchronous teaching, Medical education, Synchronous teaching

INTRODUCTION

Medical education is one of the many fields substantially affected by the Coronavirus Disease-2019 (COVID-19). Both teachers and students are adapting to the newer modalities of online teaching and learning nowadays. Among the various teaching modalities, lectures still remain as an effective method to cover large topics for a large number of students at a time. Online lectures can be delivered in two ways. A recorded lecture can be uploaded and students can watch it at their leisure time or a live session with the teacher and students attending at the same time on a feasible online platform. The first method falls under the asynchronous, while the second, into the synchronous method of teaching and learning. Both the methods have their own advantages and disadvantages. In synchronous method of teaching, learning occurs for all the students at the same time with live interaction with the teacher (offline or online), while, in asynchronous method of teaching, learning takes place at different times and places with respect to each student, but without live interaction with the teacher [1]. Live online lectures are one form of synchronous teaching which is being followed in medical education, nowadays. Live lectures improves the sense of community among students and also improves the collaborative effort among students [2] as, they attend the class and learn together. The presence of a teacher, as well as, engaging in face-to-face interactions with faculty, whether online or offline, has a positive influence on students' psyche and motivation to learn [3]. Live online lectures have many disadvantages as well. One of the major disadvantages of a live lecture is the time constraint [4]. The timing of a live online lecture may not be feasible for all students. Some may be more attentive during the first hours of the day while others, during the afternoon hours. Furthermore, some students may lose the ability to concentrate if, the lecture is long or monotonous, as research has shown that, the average attention span for students is about 10-15 minutes [5]. And finally, another disadvantage of a live online lecture is the data connectivity issues for both the faculty, as well as, the students [6]. Many studies showed that, during the class, poor connectivity will drastically change the mood of the lecturer, as well as, the students, which in turn decreases the productivity of the lecture. Though, live online lectures have disadvantages, still it remains as a time-tested effective method of delivering large information to a large number of students.

Asynchronous teaching in the form of a recorded video lecture given to the students, has the advantage of not having stringent time restrictions [7]. A recorded video lecture, when made available for a certain period of time, can be viewed by the student at their own leisure. He can pause, rewind and rewatch the video as needed. But since, the teacher is not present, asynchronous learning heavily depends on the student's own interest [3]. Less motivated and academically weak students may find it difficult to follow asynchronous teaching and learning methods, as there is no instant access to the teacher to clear their doubts and no simultaneous answers to their questions from the teacher, as well as, from other students [6].

Some teachers prefer recorded lectures while, others live ones based on personal preferences and experience. The faculty must ultimately decide which method is better for the benefit of the students, in terms of acceptance and knowledge gained. Particularly in the field of medical education, hardly few studies are available that throw light on this matter and hence, the present study was aimed to determine the effectiveness of recorded video lectures vs

live online lectures and to analyse the students' perception regarding these two teaching methods.

MATERIALS AND METHODS

The present prospective interventional study was conducted in the Department of Physiology at Sree Gokulam Medical College and Research Foundation, Venjaramoodu, Trivandrum, Kerala, India. The duration of the study was six months, from March 2021-August 2021. The Institutional Ethical Committee Clearance was obtained (IEC No 38/530/02/2021).

Inclusion criteria: Phase 1 medical students and those, who were willing to give consent were included in the study.

Exclusion criteria: Students, who were not able to attend any type of lectures and those who were unwilling to participate were excluded from the study.

Sample size calculation: A total of 150 students (97 girls and 53 boys) in two groups of 75 each (convenient sampling). The students were divided based on simple random allocation with each group having two live and two recorded lectures (Total of four interventions).

Study Procedure

At the beginning of the study, the participants were sensitised about the study and given assurance that, this will not in any way influence their academic grading. This was to make sure that, the students didn't indulge in any unwanted or result influencing activities during the conduct of the study. The students were also instructed to strictly follow the instructions given to them. The participants were randomly allocated to two groups (G1 and G2) (n=75). Separate google classrooms were created for both groups.

First intervention: Topic 1 (apoptosis) was taught to the groups by two different methods. Group 1 had a live online lecture using "Google Meet" while group 2, was given a recorded video of the same lecture that was taken for group 1. The recorded video was uploaded on "Edpuzzle". Group 2 viewed the recorded video lecture at their desired time and they could view it multiple times also within 24 hours. After 24 hours the video was not available for viewing. Then, after three days both groups were assessed using separate Google Forms with Multiple Choice Questions (MCQ) and one word answer type questionnaire. The questions were the same for both groups and the maximum marks awarded was 10. This assessment was conducted at the same time for all the students. To make sure the recorded video was not viewed by students in the other group, the authors used a learning management system called "Edpuzzle" which required the student's email id for viewing the video. The lecture duration varied from 30-40 minutes and the same faculty took all the lectures.

Second intervention: Topic 2 (body fluid compartments) was taken, but the mode of delivery of lecture was crossed over between the groups. The rest of the steps were the same. The third (physiology of nutrition) and fourth (physiology of ageing) interventions also followed suit with the mode of delivery of lecture getting crossed over each time. Therefore, there were eight exposures with each group having two live and two recorded lectures (total of four interventions).

STATISTICAL ANALYSIS

The assessments after each intervention were finally analysed using the Unpaired or independent t-test. The analysis was done using Statistical Package for Social Sciences (SPSS) version 21.0. The student's perception about both teaching methods was obtained using a questionnaire.

RESULTS

The mean age of the students was 18.5 years. A total of 150 students (97 girls and 53 boys) in two groups of 75 each. Group 1 had 46 girls and 29 boys while, group 2 had 51 girls and 24 boys. The mean and Standard Deviation (SD) of the scores of all four interventions are shown in [Table/Fig-1] below. Independent t-test was used to analyse the mean scores. The analysis showed that, students who attended live online lectures scored little more than those, who watched recorded video lectures in three sessions while, it was reversed in only one session. Though, the marks were higher for students, who attended live online lecture in three sessions, the difference was statistically significant (p-value <0.05) in one session only.

Topics	Method/intervention	Frequency (n)	Mean±SD	p-value
1	Live online lecture (G1)	62	7.17±1.57	0.001*
	Recorded video lecture (G2)	64	6.46±2.23	
2	Live online lecture (G2)	63	5.90±1.93	0.504
	Recorded video lecture (G1)	59	5.98±1.76	
3	Live online lecture (G1)	57	7.10±2.53	0.419
	Recorded video lecture (G2)	60	7.00±2.23	
4	Live online lecture (G2)	62	6.75±2.43	0.693
	Recorded video lecture (G1)	66	6.24±2.48	

[Table/Fig-1]: Comparison of marks obtained by the two groups.
*Statistically significant (Independent t-test)

The students had various preferences among the two teaching methods based on the question that was asked, as shown in [Table/Fig-2]. For example, the students felt that, recorded lectures were better for note taking and for scoring good marks while live lectures, were better for faculty-student interaction. But majority of the students had a neutral opinion about the two methods which showed that, both the methods inspite of having different merits and demerits, were equally effective as teaching methods. But most of the students felt that, if the live lectures were given as recorded videos that would be very beneficial.

Questions	Strongly agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly disagree n (%)
If live lectures are later given in a recorded format to students, it will be more beneficial	51 (39.84)	51 (39.84)	15 (11.72)	7 (5.47)	4 (3.13)
Recorded lectures encouraged me to interact more with the teacher	6 (4.69)	28 (21.88)	51 (39.84)	33 (25.78)	10 (7.81)
I want all future lectures to be recorded lectures only	18 (14.06)	21 (16.41)	46 (35.94)	35 (27.34)	8 (6.25)
Recorded lectures induced more interest to learn the topic than live lectures	19 (14.84)	37 (28.91)	46 (35.94)	24 (18.75)	2 (1.56)
Recorded lectures are more beneficial to the student than live lectures	24 (18.75)	47 (36.72)	41 (32.03)	10 (7.81)	6 (4.69)
I felt recorded lectures helped me score more in exams	27 (21.09)	50 (39.06)	31 (24.22)	15 (11.72)	5 (3.91)
Recorded lectures are better for note taking than live lectures	49 (38.28)	53 (41.41)	19 (14.84)	7 (5.47)	0
I preferred to listen to recorded lectures than live lectures	20 (15.63)	45 (35.16)	35 (27.34)	22 (17.19)	6 (4.69)

[Table/Fig-2]: Students' perception about the two teaching methods.

DISCUSSION

The present study suggested that, recorded video lectures are equally effective as live video lectures. Since, both methods are equally effective that means the marks obtained by the students is determined by the motivation level of the students. The result was similar to the result got by Brockfeld T et al., in 2014 [8]. They conducted a similar study on around 200 medical students at the University of Göttingen and they also found that, recorded video lectures are equally effective as live online lectures, as a teaching tool to medical students. The findings of research done by Chauhan VD et al., Lew EK and Nordquist EK, and Kumar P et al., were comparable to the findings of the present study [9-11]. These studies found out

that, there were no significant differences between the two teaching methods, but students preferred recorded lectures and also, desired the study material be shared with them after the lecture. Now, as the students prefer to watch recorded lectures, the faculty must provide good quality content via recorded lectures. An article by Kurzweil D et al., provides some guidelines to help the faculty in preparing good quality recorded lectures [12]. They give information about how to plan the lecture, length of the lecture, how to prepare the script etc.,

However, the results of the present study was different from a study done by Islam M et al., they found that, prerecorded video was more effective than live online lectures [13]. This difference could be due to the fact that, they had conducted the study among business management students whereas, the present study was done on medical students. Horn D in 2020 stated that, recorded lectures cannot be utilised in the same way by all the students [14]. He stated that, only those students, who are academically motivated can reap benefits from the recorded lectures whereas, the academically poor performing students will find it difficult to learn using only recorded lectures. The authors also agreed with this statement, as recorded lectures need a lot of effort from the students and so ultimately, it was the motivation level of the students, which decided the efficacy of recorded lectures as a teaching tool. In another study by Babu R et al., where they compared other synchronous and asynchronous teaching methods, they found that, the synchronous teaching method was slightly better than the asynchronous method [15]. This difference could be due to the fact that, the methods being evaluated were different than the ones evaluated in the present study. They were checking the efficacy of instructor led live online method vs self-pace learning whereas, the authors compared live and recorded lectures.

While, looking at the student's perception about both methods, they preferred recorded video lectures to live online lectures. This was similar to the finding obtained by Cardall S et al., [16]. The students felt that, recorded lectures are better than live online lectures for note taking. They also observed that, recorded lectures helped them to score more or were more beneficial than live lectures though the scores obtained showed otherwise. But a closer look at the Likert scale showed, the neutral option also had a higher percentage for most of the questions which showed that, both the teaching methods were equal in many aspects. The students preferred recorded lectures, which may be due to the fact that, recorded lectures are free from time constraints and students have control over the lecture like stopping, pausing, rewatching etc., [16]. However, the students also felt that, the interaction with the teacher, like asking doubts, pushing of unmotivated students were lacking in recorded video lectures. A study by Orellano C and Carcamo C stated that, students preferred to learn clinical courses through recorded lectures, but equal importance must also be given to live lectures and maximum benefit can be achieved by incorporating blended learning techniques only [17].

Finally, the authors recommended that, the faculty in medical colleges can adapt either recorded video lectures or live lectures to teach medical students, as both the methods are equally effective methods. This finding can especially be made use of in places, where live online lectures are difficult to conduct due to technical issues. In those colleges, the faculty can record their lectures and upload it so that, the students can view it and learn from it. It is also recommended that, after a live lecture, the same may be given to the students in a recorded format with restrictions (to avoid misuse).

Limitation(s)

The study was conducted among students from one phase only. One subject was considered and only short-term retention was tested.

CONCLUSION(S)

Recorded video lectures are equally effective as live online lectures as a teaching tool among phase 1 MBBS students. According to the students, watching recorded lectures after a live online lectures are more beneficial.

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