

Effectiveness of Self-Explanatory Video versus Lecture Using Power Point on the Attitude, Beliefs and Understanding of Brain Death and Organ Donation among First Year MBBS Students - A Comparative Study

Anita Gaule¹, Deepali Bhagwan Aendole², Aditi Sood³, Pushpa A. Pazare⁴

¹Department of Physiology, Topiwala National Medical College & BYL Nair Charitable Hospital, Mumbai, Maharashtra, India. ²Department of Physiology, Topiwala National Medical College & BYL Nair Charitable Hospital, Mumbai, Maharashtra, India. ³Department of Physiology, Topiwala National Medical College & BYL Nair Charitable Hospital, Mumbai, Maharashtra, India. ⁴Department of Neurology, Topiwala National Medical College & BYL Nair Charitable Hospital, Mumbai, Maharashtra, India.

ABSTRACT

BACKGROUND

Organ donation program in India is still in its infancy. Lack of adequate awareness, correct information, universal rules and guidelines, regarding organ donation and brain death is partially responsible for the same. Currently, didactic lectures are the method of choice to get across a large amount of theoretical information to a large group of learners at one time. However, there is no consensus as to the best teaching and learning methods for medical students. Using the important concept of brain death and organ donation, the present study aims at comparing the effectiveness of self-explanatory video to a lecture using power point presentation using a self-administered questionnaire.

METHODS

First year MBBS students were divided into two groups namely, 'Lecture' group and 'Video' group. A self-administered questionnaire of 11 themes, consisting of 43 questions, with response either as right / wrong / don't know, or agree / disagree / don't know, or yes / no / no comments, was used in the study. At baseline (before the intervention), students of the two groups were asked to fill out the questionnaire. Then students in one group were delivered a lecture on brain death and organ donation using power-point presentation and the other group were shown a video regarding the same. Once the teaching-learning sessions were conducted, the same questionnaire was again given to the students to respond.

RESULTS

Both teaching methods demonstrated a significant improvement in scores. At baseline, both the groups had similar scores. However, post-intervention, the lecture group showed better scores in the three themes, while video group had better scores in one theme. Also, a significantly improved change of score was observed for lecture group for four themes and only for one theme in the video group.

CONCLUSIONS

Organ donation and brain death is a vast topic and it is recommended that its various sub-topics be taught employing both lectures and video assisted teaching methods. Video assistance can be used to complement the lectures and not to replace the traditional teaching method.

KEYWORDS

Brain Death, Organ Donation, Organ Transplantation, Knowledge, Video-Assisted Lecture

Corresponding Author:

*Dr. Anita Gaule,
Assistant Professor,
Department of Physiology,
Topiwala National Medical College
& BYL Nair Charitable Hospital,
Mumbai, Maharashtra, India.
E-mail: anita.shrikrishan@gmail.com*

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BACKGROUND

The complete and irreversible loss of the critical functioning of the central nervous system including the brain stem is the definition of brain death.¹ Most organ donors are brain dead, and thus, to define and confirming brain death is a key factor in the organ donation program.² Over the past decades, there have been many significant achievements in the field of organ transplantation, which has resulted in saving and improving hundreds of lives. Unfortunately, the organ donation program in India is still in its infancy and is hindered by the shortage of organ donors. It has been suggested that lack of adequate awareness, correct information and universal rules and guidelines regarding brain death and organ donation has resulted in this shortage. Healthcare providers can teach their patients and their community contacts the importance of organ donation. Additionally, they are the first individuals to diagnose brain death and establish relationship with the potential donors' family to have the opportunity to raise the option of donation.³

Learning is an active process in which the student and teacher have to work together to make the knowledge-sharing process enjoyable and easier for comprehension. Currently, didactic lectures are the method of choice to get across a large amount of theoretical information to a large group of learners at one time. However, with changing trends, the students have become inclined towards audio-visual methods of learning. With limited evidence available, there is no consensus as to the best teaching and learning methods for medical students.⁴ Using the important concept of brain death and organ donation, the present study aims at comparing the effectiveness of self-explanatory video to a lecture using power point presentation using a self-administered questionnaire.

METHODS

Study Design and Study Population

The study included all 1st year MBBS students of a tertiary care teaching hospital of Mumbai present on the day of teaching-learning session and willing to give consent for the same. The study participants were divided into two groups with equal number of high achiever and low achiever students. This classification of students was done according to their performance in the 1st terminal examination of Physiology, median marks being the cut off between high and low marks. The students were arranged in the descending order of their marks and then odd ranking students formed one group (Lecture group) and the even ranking students formed the other group (Video group). A pilot study was done by including 20 students using the above methodology of sampling. Using feedback, the study questionnaire was standardised based on the Item analysis of the questions used in the pilot study. The study was approved by the Institutional Ethics Committee. The two groups were interchanged after the completion of the study, so that both the groups were exposed to both forms of

learning. However, this second session of learning was not included as part of the research study.

Study Questionnaire

The principal investigators of the study formulated a new questionnaire, which was validated internally based on the item analysis of questions used in the pilot study, by senior faculty members of the Department of Physiology and Neurology. This self - administered questionnaire has 11 themes, consisting of 43 questions, with response either as right / wrong / don't know, or agree / disagree / don't know or yes / no / no comments. Themes included in the questionnaire pertain to definition of brain death, diagnosis of brain death, knowledge about organ donation, which organs can be donated by live or cadaver, restrictions on organ donation, attitude towards organ donation and compensation, beliefs towards donation, ways to promote donation and prevailing laws related to organ donation in India (Table 1, Annexure 1). The co - investigator of the study was not aware of these questions to minimize bias, as this co - investigator prepared the contents of the lecture and video.

Data Collection and Data Analysis

At baseline (before the intervention), students were asked to fill out the questionnaire. Then students from both the groups, made to sit in separate rooms. One group was delivered a lecture on brain death and organ donation using power-point presentation and the other group were shown a video regarding the same. Once the teaching-learning sessions were conducted, the same questionnaire was again given to the students to respond. The completed questionnaire forms were marked and a score was given for each of the 11 themes. The data thus collected were entered in the Microsoft Excel sheet and checked for errors. This data were imported in SPSS (version 23, IBM NY) for statistical analysis. Before and after intervention scores were compared using paired t - test, while inter-group comparison of scores was done using student's t test. A statistical significance was noted for p values less than 0.05.

RESULTS

There were 55 students in lecture group and 57 students in the video group. There was no loss of participants during the pre- and post - test period of filling the questionnaires. Table 2 describes how the scores compared before and after intervention in the lecture group. We saw a significant improvement in mean scores for all theme questions except for theme 9, which asks about the beliefs towards donation. Although there was an increase in mean score from 2.7 ± 0.67 to 2.86 ± 0.51 , the difference was not statistically significant (p value = 0.13). The mean total score of the students increased significantly from 30.05 ± 7.92 to 48.49 ± 6.26 . Similarly, table 3 describes how the scores compared before and after intervention in the video group. There was a significant improvement in all themes except theme 4. This

theme asks questions about the organs which can be donated in live patients. Figure 1 compares the scores between the two study groups before intervention (at baseline) and after intervention. As shown in figure 1 (A), the mean scores between the two study groups were comparable. After intervention [Figure (B)], we saw significantly higher mean scores in the lecture group for theme 3 (2.59 ± 0.62 vs 2.19 ± 0.62 , p value < 0.001), theme 5 (9.07 ± 2.81 vs 6.35 ± 3.91 , p value < 0.001), and theme 11 (4.16 ± 1.33 vs 2.52 ± 0.93 , p value < 0.001). Only for theme 1, mean score was significantly higher for the video group as compared to the lecture group (8.96 ± 0.33 vs 7.86 ± 1.32 , p value < 0.001). The change in mean scores was significantly higher in the lecture group for theme 4 (1.25 ± 2.59 vs 0.15 ± 2.27 , $p < 0.05$), theme 5 (4.61 ± 4.02 vs 1.35 ± 3.15 , $p < 0.001$), theme 10 (0.98 ± 0.85 vs 0.5 ± 0.69 , $p < 0.01$) and theme 11 (3.59 ± 1.76 vs 1.89 ± 0.9 , $p < 0.001$), as described in Table 4. On the other hand, video group had a significantly higher score increase for theme 7 (1.43 ± 1.27 vs 0.91 ± 1.29 , $p < 0.05$).

Theme No.	Questions	Number of Questions
1	Definition of brain death	10
2	How to diagnose brain death	4
3	Knowledge about organ donation	3
4	Which organs can be harvested in live	12
5	Which organs can be harvested in cadaver	12
6	Restrictions for Organ donation	3
7	Attitude towards organ donation	9
8	Attitude towards compensation	3
9	Beliefs towards organ donation	3
10	Regarding methods of promotion of Organ donation	3
11	Knowledge about National, state and zonal regulatory bodies and laws	5

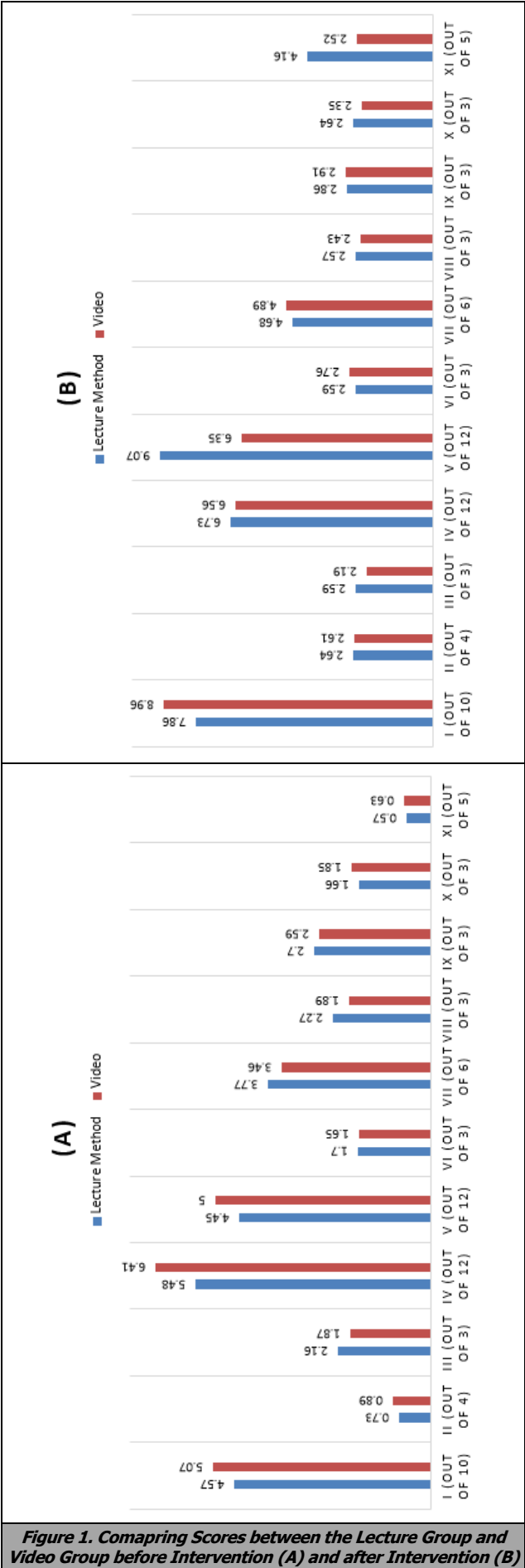
Table 1. Structuring of the Study Questionnaire

Question Themes	Lecture				P Value
	Before Mean	SD	After Mean	SD	
I (out of 10)	4.57	1.73	7.86	1.32	< 0.05
II (out of 4)	0.73	0.9	2.64	0.65	< 0.05
III (out of 3)	2.16	0.78	2.59	0.62	< 0.01
IV (out of 12)	5.48	2.53	6.73	2.56	< 0.01
V (out of 12)	4.45	2.98	9.07	2.81	< 0.05
VI (out of 3)	1.7	0.85	2.59	0.62	< 0.05
VII (out of 6)	3.77	1.68	4.68	1.51	< 0.05
VIII (out of 3)	2.27	0.97	2.57	0.85	< 0.05
IX (out of 3)	2.7	0.67	2.86	0.51	0.13
X (out of 3)	1.66	0.86	2.64	0.57	< 0.05
XI (out of 5)	0.57	0.76	4.16	1.33	< 0.05
Total (out of 64)	30.05	7.92	48.39	6.26	< 0.05

Table 2. Comparing Scores before and after Intervention in the Lecture Group

Question Themes	Video				P Value
	Before Mean	SD	After Mean	SD	
I (out of 10)	5.07	1.88	8.96	0.33	< 0.05
II (out of 4)	0.89	0.82	2.61	0.56	< 0.05
III (out of 3)	1.87	0.73	2.19	0.62	< 0.01
IV (out of 12)	6.41	2.78	6.56	2.4	0.71
V (out of 12)	5	3.03	6.35	3.91	< 0.01
VI (out of 3)	1.65	1.05	2.76	0.51	< 0.05
VII (out of 6)	3.46	1.68	4.89	1.34	< 0.05
VIII (out of 3)	1.89	1.13	2.43	0.98	< 0.001
IX (out of 3)	2.59	0.6	2.91	0.29	< 0.001
X (out of 3)	1.85	0.86	2.35	0.78	< 0.05
XI (out of 5)	0.63	0.9	2.52	0.93	< 0.05
Total (out of 64)	31.43	6.86	44.56	6.18	< 0.05

Table 3. Comparing Scores before and after Intervnetion in the Video Group



Question Themes Change in Score	Groups				P Value
	Lecture		Video		
	Mean	SD	Mean	SD	
I (out of 10)	3.3	1.96	3.89	1.92	0.21
II (out of 4)	1.91	0.98	1.72	0.88	0.28
III (out of 3)	0.43	0.87	0.31	0.8	0.65
IV (out of 12)	1.25	2.59	0.15	2.27	< 0.05
V (out of 12)	4.61	4.02	1.35	3.15	< 0.001
VI (out of 3)	0.89	0.84	1.11	1.06	0.36
VII (out of 6)	0.91	1.29	1.43	1.27	< 0.05
VIII (out of 3)	0.3	0.79	0.54	1	0.21
IX (out of 3)	0.16	0.81	0.31	0.61	0.22
X (out of 3)	0.98	0.85	0.5	0.69	< 0.01
XI (out of 5)	3.59	1.76	1.89	0.9	< 0.001
Total (out of 64)	18.34	6.92	13.13	5.18	< 0.001

*Table 4. Comparing Change in Scores
in the Lecture vs Video Group*

**Table 4. Comparing Change in Scores
in the Lecture vs Video Group**

DISCUSSION

A classroom contains students with different learning preferences. Consequently, health-care educators may wish to employ teaching-learning techniques that have the potential to support students with varied learning capabilities. Thus by improving the teaching-learning methods, better knowledge and understanding can be attained by the future healthcare professionals, leading to better patient satisfaction, and decreased professional anxiety. Organ transplantation is one of the most important, emerging and ever evolving modality of treating end-stage organ failure. Organ retrieval rates depend on the knowledge and attitudes about brain death and organ donation among the population, which can be influenced positively by the healthcare professionals.⁵ In the present study, students in the lecture group had higher mean score as compared to students in the video group after the intervention, scores which were similar before the baseline. Also, lecture group demonstrated a significantly higher mean improvement in scores as compared to those in the video group.

In our study, it was observed that lecture method could not improve the mean scores for theme 9 and video method for theme 4. Theme 9 asks questions pertaining to beliefs towards organ donation in relation to religion, while theme 4 asks questions related to which organs can be harvested in live people. Although we did not collect information regarding the religion of the respondents, religion has previously been shown to be associated with organ donation attitudes and beliefs. It has been suggested that Hindus believe strongly in life after death with a continuous cycle of birth and rebirth, which may inhibit them from volunteering for organ donation. On the other hand, Christianity and Jainism faith strongly support organ donation and consider it an example of selfless sacrifice.⁶

Mayer's cognitive learning theory suggest that the most important feature that differentiates traditional lectures from video-supported teaching is the information which is given on videos that is processed both visually and auditory, at the same time, making learning easier.⁷ After the teaching intervention, we observed a significantly improved mean score in the lecture group for theme 3, 5 and 11. Theme 3 asks general questions about organ donation, theme 5 asks

about which organs can be harvested in cadavers and theme 11 asks about the prevailing laws related to organ donation.

These are mainly theoretical topics and it appears from the results that students felt more comfortable in learning about these concepts with a power point presentation. On the other hand, the video group demonstrated a significant improvement for only theme 1, which asks questions related to the definition of brain death. It is believed that this being a conceptual topic, the students in the video group fared well than the lecture group. Similar results were obtained by Viswasom et al, who studied 94 medical students to compare the effectiveness of video teaching over traditional teaching methods for the subject of Anatomy.⁸ In their study, students were able to identify bony landmarks better when taught using video method. Lectures may present with synchronization problems and disjunction between figures and words leading to reduced comprehension, whereas video clips present synchronized visual and auditory information, which leads to increased comprehension.⁹

Contrary to our findings, many investigators have reported no significant difference between traditional and video assisted teaching of medical students. In the study by Schreiber et al, in which classical traditional lectures and video-supported lectures are compared using undergraduate students, there was no difference found in the MCQ results.¹⁰ Moreover, in the study by Davis et al, in which undergraduate groups are compared with the basis of classical traditional lectures, which are prepared with Microsoft® PowerPoint®, and the lectures are supported with computers and voice records, they cannot find any difference in the MCQ results.¹¹ In a small group of medical students, Nongmeikapam et al compared video-assisted teaching versus didactic lectures for psychiatry teaching.¹² The authors found the two teaching methods to have similar effect on post-test scores. Similar observations were made recently in patient education as well.¹³ It is possible that the contents of the topic and type of subject can affect the final outcomes. It is therefore, recommended that such evidence be generated in future studies for varied topics of medical school subjects so that an informed and evidence based decision to use either of the two teaching methodologies can be employed.

One limitation of the study, is that students of either gender were not evenly distributed. This does create the possibility of introducing a confounding factor of gender if males and females inherently learn differently. It is possible that this could affect the validity of the results of the study; however, identifying differences in test performance based on gender was not an aim of the study, and thus, no effort was made to equalize the groups by gender. Other limitations of the study include lack of time for reflection on the new knowledge, as only one session of the contemporary teaching method was given to the students as part of the intervention. Previous studies show that reflection may be an important part of learned material becoming applied skills;¹⁴ however, due to time constraints, this was not possible.

CONCLUSIONS

Incorporating basic education about brain death and organ donation early in medical colleges can help in generating interest as well as imparting correct knowledge to the medical students, the future healthcare force of our society. Our results show that both lectures and video assisting teaching methods led to an increase in overall mean scores. However, we observed that lecture-based teaching had significantly improved post-test scores for three themes as compared one theme in the video method. Organ donation is a vast topic and it is recommended that its various sub-topics be taught employing both lecture and video-assisted teaching methods. Video assistance can be used to complement the lectures and not to replace the traditional teaching method.

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