Application-Based Animation Based Teaching vs Cadaver Dissection Based Teaching. A Cross - Sectional Comparative Study in I - MBBS

Naik Shishir Kumar¹, Kaur Harmeet², Minakshi³, Upadhyaya Prerna⁴

¹Associate Professor, Department of Anatomy, Jaipur National University Institute of Medical Sciences and Research Centra, Jaipur, India;

²Assistant Professor, Department of Anatomy, Jaipur National University Institute of Medical Sciences and Research Centra, Jaipur, India;

³Assistant Professor, Department of Biochemistry, Jaipur National University Institute of Medical Sciences and Research Centra, Jaipur, India;

⁴Professor and HOD, Department of Pharmacology, Jaipur National University Institute of Medical Sciences and Research Centra, Jaipur, India.

ABSTRACT

Background: With the growing number of Medical Colleges in the country, proclaiming cadavers for dissection based teaching in the Department of Anatomy has been a difficult task in recent years. The students in the first year not only learn Human Anatomy but also learn to empathize, without which being a doctor becomes the hollow experience. But today's generation is computer savvy and they are adjusted to learn online. But is it possible to learn Human Anatomy only by application-based simulation or the traditional cadaver based teaching is also needed? This study puts in a sincere effort to find the answer.

Methods: 150 students were selected in the Department of Anatomy, JNUIMSRC, Jaipur. They were divided into two groups by the lottery method. One group underwent cadaver based learning for 5 classes each of gross anatomy and surface marking. At the end of the session, the perception of the students was asked in the form of a Likert's scale followed by Multiple choice question (MCQ) based question and Objective structural pattern examination (OSPE) examination.

Results: The perception score was better in the application based Animation based teaching group.

- The MCQ score was better in the application based Animation based teaching group.
- The OSPE score was better in the cadaver based teaching group.
- After 30 days
- The MCQ score was better in the application based Animation based teaching group.
- The OSPE score was better in the cadaver based teaching group.

Conclusion: Cadaver based teaching is better for practical understanding and Animation based teaching can be used only as an adjuvant for cadaver based teaching.

Key Words: Cadaver, Dissection, Animation

INTRODUCTION

Our Nation is undergoing a great medical teaching revolution. The new curriculum has been introduced in 2019 by the Medical Council of India and great emphasis has been laid on CBME (competency-based Medical Education). National Medical Commission which replaced the Medical Council of India also emphasized the use of a new curriculum. The growing number of medical colleges in the country and lack of trained faculties adds to the problem of implementing teaching programme. Pre-Clinical subjects are the core subject in Medical Education and the foundation on which

the CBME curriculum is supposed to stand. With all these in the background, cadavers are very hard to be proclaimed for Medical Education, a sorry state for a country that boasts of 1.5 billion populations. Lack of trained teachers at one end and lack of cadavers for teaching at the other end of the spectrum adds to the quandary the situation has created.^{1, 2}

Some authors in their study have debated over the importance of cadaver based teaching in Medical Education.¹⁻⁴ Some authors have reported the absolute necessity for the use of human cadavers for the fact that it provides practical superiority by adding tactile and visual superior expe-

Corresponding Author:

Dr. Minakshi, Assistant Professor, Department of Biochemistry, JNUIMSRC, Jaipur, India.

Ph: 8901188406; Email: drminakshi29@gmail.com

ISSN: 2231-2196 (Print)

ISSN: 0975-5241 (Online)

Received: 23.10.2020

Revised: 14.12.2020

Accepted: 07.02.2021

Published: 22.06.2021

riences.^{5,6} Some on the other end have argued the opposite and questioned the use of cadavers in today's modern age of technological advances.⁷ Western countries have already restricted the use of cadavers in Medical Education.⁷ Also the cost of maintaining cadavers against economically viable options has to be weighed against.⁷ This study puts in a sincere effort to find the better method of teaching in terms of perception score, Multiple choice question test and also OSPE examination.

AIMS AND OBJECTIVES

- To study the perception score between the two groups.
- To study the MCQ score between the two groups.
- To study the OSPE score between the two groups.
- To understand which method is better for the students to retain the concepts for a longer time.

MATERIALS AND METHODS

This study was done in the Department of Anatomy, JNUIM-SRC, Jaipur.

This study was conducted from February 1st 2020 to March 15th 2020.

All students from the 1st year MBBS were selected. The total sample size was thus 150.

The design of the study was Interventional and Cross-over.

The students were divided into 2 groups based on the lottery method.

Tools: Validated Questionnaire, MCQ and OSPE

Inclusion Criteria:

1st MBBS students of 2019-2020 batch

Exclusion Criteria:

Students who did not give consent.

Data Collection: Likert's scale analysis and OSPE score.

Procedure:

Group 1 was made to undergo 5 classes of gross anatomy and surface marking in cadaver based teaching.

Group 2 was made to undergo 5 classes of gross anatomy and surface marking in animation application-based teaching.

The application was used as a window based complete Anatomy Application.

At the end of the session, the perception score was taken. The Likert's scale questionnaire was prepared and validated. Then after the sessions, the MCQ questionnaire was immediately distributed and the answers were taken. After this immediately the students were taken into the dissection hall for the OSPE examination.

All of this was repeated after 30 days to find which method to be the superior tool for retaining the subjects which were taught.

Statistical Analysis

- The perception score was analysed using an unpaired t-test.
- Unpaired t-test to compare the difference in the two methods of teaching in terms of Multiple Choice Questions score and OSPE score.
- Paired t-test was used to analyse the OSPE scores and MCQ scores between the scores obtained after the lecture session and the scores obtained after 30 days.

At the end of this session, the student groups underwent cross over and the same thing was repeated. No exams were conducted and it was done only for ethical reasons.

RESULTS

We found out that the new generation of medical students was more interested in animations and their perception scores reflect on the same. Even the MCQ exams result reflected that it would be a better idea (**Table 1**). But when it came to OSPE examination the old trusted cadaver based teaching was the clear winner. Practising Medicine is always dynamic and there are many domains under which the students need to be trained. Of course, the knowledge domain can be touched by using these new gizmos but the psychomotor is much more complex to be trained and the old trusted cadaver based teaching answers this question. Even the retaining of knowledge was better in each of the groups (**Table 2**).

Table 1: Independent T Test to Compare between the Two Groups

	Group	N	Mean	Std. Deviation	P Value
PERCEPTION SCORES	Cadaver	75	34.48	2.17	<0.001
	Animation	75	46.16	2.12	
OSPE	Animation	75	15.12	4.1	<0.001
	Cadaver	75	22.1	3.9	
After 15 days- OSPE	Animation	75	13.43	4.2	<0.001
	Cadaver	75	20.34	3.1	
DIFFERENCE IN OSPE IN 15 DAYS	Animation	75	1.69	5.14	0.185
	Cadaver	75	1.76	3.62	
MCQ	Cadaver	75	5.82	2.18	<0.001
	Animation	75	8.68	1.1	
MCQ-AFTER 15 days	Cadaver	50	3.8	1.66	<0.001
	Animation	50	7.17	1.52	
MCQ DIFFERENCE	Cadaver	50	2.02	2.641	0.424
	Animation	50	1.51	1.75	

Table 2: Paired T Test for Comparison of the Before and After Values in Each Group Separately

Group		N	Mean	Std. Deviation	Paired Differences Mean Difference	P-Value
CADAVER	OSPE	50	22.1	3.9	1.69	<0.001
	After 15 days-OSPE	50	20.34	3.1		
Animation	OSPE	50	15.12	4.1	1.76	0.003
	After 15 days-OSPE	50	13.43	4.2		
Cadaver	MCQ	50	5.82	2.18	2.02	<0.001
	MCQ-AFTER	50	3.8	1.66		
Animation	MCQ	50	8.68	1.1	1.51	<0.001
	MCQ-AFTER	50	7.17	1.52		

DISCUSSION

If we check our past, men have been studying Human Anatomy on cadavers for a very long time. We are now in the 21st century and we have been constantly trying to reach and try new methods to replace the old. A very little amount of time has been spent and little is known on how to learn using these new technologies against the time tested methods.^{5,6}

Teaching and learning anatomy is not defined to or just limited to learning whatever the books printed. Of course, learning and completing the syllabus is one of the dimensions. But at the same time at a much deeper level Anatomy teaches the basic ethical values and empathy to the students. This cannot be merely replaced by today's fancy technology.^{7,8}

The actual transfer of the knowledge from the animation to the cadaver also was not taking place and this was proven by the gap in the OSPE scores between the two methods of teaching. This was also suggested by another two studies conducted by Hisley et al.⁸ and Nasr et al.⁹ We are in full agreement with those two studies.

CONCLUSION

Cadaver based teaching is better for practical understanding and Animation based teaching can be used only as an adjunct for cadaver based teaching. Animation can be used when cadavers are very scarce. But if cadavers are not available for dissection purpose there should be at least prosection (demonstration of already dissected bodies) which can be combined with animation based teaching. It is highly recommended to make the students accustomed to the cadavers so that sufficient time is given to the students so that they can make the adjustments both physically and mentally. They should learn to empathize and at the same time also learn to be mentally fit and qualified to handle human tissues.

The animation based is a great adjuvant but cannot be used to create moral and ethical grounds for the students.

Conflict of Interest: Nil.

Source of Funding: Self-funded.

AUTHOR CONTRIBUTION:

1. Naik C Shishir Kumar: Principal investigator, Research methodology.
2. Dr Kaur Harmeet: Principal Investigator
3. Dr Minakshi: Principal Investigator and research methodology
4. Dr Upadhyaya Prerna: Principal investigator, statistics.

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