ORIGINAL RESEARCH

Cadaveric dissection versus Virtual Dissection table- Perspective of First year MBBS students

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ABSTRACT

Background: The traditional method of teaching Anatomy by cadaveric dissection has always been considered the essential foundation of medical education.Recent decade has seen a surge in opening of new medical colleges, and many colleges do not have enough cadavers for dissection. With the advancement of technology there is availability of Virtual dissection tables in government as well as private medical colleges. Although it is a good learning tool, its utility from students perspective needs to be studied. **Methods:** Structured Questionnaire designed on google form was sent to students of first MBBS batch 2024-25 and their responses were studied. Data was analysed by using basic statistical methods. **Results:** 98% of students think Cadaveric dissection is better for developing surgical skills and 90% consider it is better for preparing them for clinical practice as compare to Virtual dissection.According to 74% studentsvirtual dissection method is easier and less time consuming. Majority of the students (97%) are sure about virtual dissection and cadaver dissection when used in combination gives better understanding. **Conclusions:** 1. Cadaveric dissection is an integral and irreplaceable tool of learning Human Anatomy. 2.Traditional cadaveric dissection in combination with Virtual dissection table gives best understanding of Anatomy.

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INTRODUCTION

The traditional method of teaching anatomy by dissection of the human body has always been considered the essential foundation of medical education, ever since Andreas Vesalius (1514–1564) considered as the "Father of Modern Human Anatomy" dissected the human body in 1543.¹

Anatomy should be presented and learned as a dynamic basis for problem solving and for application in the practice and delivery of quality health care. Using only models, images, audiovisual aids, or computers cannot lead students to the requisite reasoning that comes from dissection of cadavers.²

With the global advancement in technology and its applications, computer-based and multimedia-assisted educational aids such as animations, movies, threedimensional models, and virtual dissection tables have been introduced in anatomy education. The evolution has been necessitated by the need for improved teaching and learning methods to understand the complex structure of human body. There is an increased need for the use of innovative technologies in anatomy education.³

Recent decade has seen a surge in opening of new medical colleges, and many colleges do not have enough cadavers for dissection. With the advancement of technology there is availability of Virtual dissection tables in government as well as private medical colleges. Although it is a good learning tool, its utility from students' perspective needs to be studied.

According to available data there are many surveys conducted within and outside India to compare between Cadaveric and Virtual dissection, but due to scarcity of data in the region of Maharashtra, the present study was conducted.

AIM & OBJECTIVES

To identify the learning preferences of first year MBBS students towards traditional cadaveric dissection and Virtual dissection table

MATERIAL AND METHODS

This is a qualitative questionnaire based cross sectional study conducted on first year MBBS students at IGGMC.

Approval of institutional ethics committee was Taken. (No. IGGMC/Pharmacology/IEC/89/2025)

Written informed consent was taken from the students.

At our institute the usual ratio for cadaver dissection is onecadaver per 20 students. For the Virtual dissection we used the CadavizTM virtual dissection table. Students were allowed to explore both the methods adequately.Structured Questionnaire designed on google form was sent to the students after 5-6 months of exposure to both the methods of dissection and their responses were studied. Questionnaire was sent to 200 students of first MBBS batch 2024-25. A period of 1 week was given to respond to the questionnaire. After a period of 1 week alternate day reminders were sent and at the end of 2 weeks response submission was closed.

Exclusion criteria

- 1. Students who did not attend at least 5 sessions of each method
- 2. Students who do not wish to take part in the study

3. No response to the reminders sent for submission.

Data was analysed by using basic statistical methods.

RESULTS

Questionnaire was submitted to 200 students of which 185 students responded (response rate 92.5 %) remaining 15 students did not respond to 3 reminders hence were excluded from the analysis.

Results of the study are summarised in table I and II.

Table No I

Question	Yes	No
Do you take active participation in cadaveric dissection?	180 (97%)	5 (3%)
Do you find 3D anatomy virtual dissection method is more interesting and		
interactive than other digital visualization resources like YouTube videos,		
models, atlas, etc.?	164 (89%)	21 (11%)
Do you think virtual dissection could replace cadaver dissection in the future?	26 (14%)	159 (86%)
Do you think virtual dissection and cadaver dissection when used in		
combination gives better understanding?	180 (97%)	5 (3%)

Table No II

Question	Cadaver	Virtual	Both
Which method is easier and less time consuming ?	48 (26%)	137 (74%)	
Which method helped you to better understand the anatomy of the			
human body?	154 (83%)	31 (17%)	
Which method helped you to better visualise the anatomical			
structures?	122 (66%)	63 (34%)	
Which method allowed you to better explore the relationships			
between different anatomical structures?	116 (63%)	69 (37%)	
Which method do you think is better for preparing you for clinical			
practice?	166 (90%)	19 (10%)	
Which method do you think is better for developing surgical skills?	181 (98%)	4 (2%)	
Which method do you think is better for understanding anatomical			
variations?	139 (75%)	46 (25%)	
Given a choice what would you prefer?	40 (22%)	4 (2%)	141 (76%)

The results of the survey revealed that,

Majority of students (83%) are of the opinion that cadaveric dissection helped them to better understand the anatomy of the human body.

98% of students think Cadaveric dissection is better for developing surgical skills and 90% consider it is better for preparing them for clinical practice as compare to Virtual dissection.

89% of students find 3D anatomy virtual dissection method is more interesting and interactive than other digital visualization resources like YouTube videos, models, atlas etc. According to students (74%), virtual dissection method is easier and less time consuming. Most of the students (97%) are sure about virtual dissection and cadaver dissection when used in combination gives better understanding.

DISCUSSION

Teaching and learning anatomy is dependent on cadaveric dissection since ages, which provides a hands-on, tactile experience that is essential for understanding the complex structures of the human body. As a crucial subject in the medical curriculum, anatomy demands innovative teaching methods to make it a student-friendly subject.

The present CBME curriculum is built on key principles such as competency frameworks,

integration of theory and practical, assessment, early clinical exposure and self-directed learning. Though cadaver dissection has proved to be an ideal method of learning anatomy, the increasing number of medical colleges &students per class, the shortage of cadavers, and the need for interactive learning made it necessary to incorporate information technology in anatomy⁴

R. Malhotra et al. in 2016 conducted a comparative study of effectiveness of cadaver dissection versus computer assisted dissection in students of AIIMS Rishikesh and 97% students think that computer assisted virtual dissection can be used as a complementary tool to actual dissection, Same as in the present study 97% students wants both the methods to be used in combination.⁵

Amit Singh Bharati et al in 2018 studied Student Perception of Virtual Dissection Table (Anatomage) at GSL Medical College, Rajahmundry and 90% of students strongly agreed that Anatomage can be an adjunct or added tool to cadaveric dissection but not its replacement.⁶

Elizabeth, et.al, in 2022 studied medical students' perception of Anatomage in 50 students of University Uzairue, Edo State, Nigeria and concluded that Anatomage can play a significant role in the attaining 3D anatomy knowledge and promises to be a useful adjunct to traditional learning modalities.⁷

The above two studies used Anatomage as virtual dissection table and the present study used Cadaviz, still their final conclusion of using 2 methodologies in combination matches with the present study.

Ali Akmal Naeem et al conducted study in 2022, at Lahore medical & dental College, 93 students responded to the questionnaire, with the majority was of the opinion that to have the best knowledge of gross anatomy the primary source of learning is dissecting a human body, while other sources has an add up effect on knowledge.⁸

Koney et al in 2024 conducted study among students at the University of Ghana Batch 2023 and concluded that Virtual dissection is an effective supplement to traditional body dissection but not a replacement. Its use alongside traditional methods improves anatomy learning. Integrating technology into anatomy education will enhance student engagement and learning.³

Sangam M, Deka R, G V, et al. (October 27, 2024) studied perception of total 89 First-Year MBBS Students Toward Virtual Dissection in Learning Anatomy in students of AIIMS Guwahati, India and Fifty-three (59.55%) students reported that they enjoyed learning anatomy through virtual dissectionand their study supports the complementary role of virtual dissection in anatomical education.⁴

However, several authors are of the same opinion like present study that lessons learnt from direct learning through human body are incomparable.⁹⁻¹² Computer simulation and technology can never equate with the complex reality of a human body.¹³Cadaver dissection

allows the first visual and tactile experience of human body for aspiring future physicians.¹⁴

Apart from various specific added values of virtual dissection, such as comprehensive exploration, interactive and dynamic learning, a few challenges faced while learning anatomy through virtual dissection, as reported by the students, are lack of tactile experience, reduced emotional impactand difficulty in developing clinical and surgical skills.

By combining virtual dissection method with the traditional one, we can enhance and create a more flexible, accessible, and engaging learning experience for the students.3D digital anatomy when combined with immersive reality can produce strong emotional impact on the learning process.¹⁵

To make the best use of the virtual dissection table, it needs to have the right software, compatible devices and a proper support system for troubleshooting. Updating the system on regular interval and integrating the two methodologies can create better impact on Anatomy learning.

CONCLUSIONS

- 1. Cadaveric dissection is an integral and irreplaceable tool of learning Human Anatomy.
- 2. It can better visualise and explore the relationship of different anatomical structures.
- 3. Cadaveric dissection can help the medical students to prepare for clinical practice and to develop surgical skills.
- 4. Anatomical variations can be best learned by cadaveric dissection.
- 5. Virtual dissection method is easier and less time consuming as compare to traditional cadaveric dissection.
- 6. Virtual dissection Table is more interesting and interactive than other digital visualization resources like YouTube videos, models, atlas etc.
- 7. Traditional cadaveric dissection in combination with Virtual dissection table gives best understanding of Human Anatomy.

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