International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Available online on: https://ijmpr.in/

Original Article

Cadaveric Dissection: An Analysis of Risks, Challenges, and Best Practices in Medical Education

Suvangi Sanjay Kumar Saha[1], Rakesh Kumar[2], Aman Damor[3], Gunwant Ramchandra Chaudhari[4]

[1] Second Year MBBS Student, Zydus Medical College and Hospital, Dahod, Gujarat, India.
[2] Assistant Professor, Department of Anatomy, Zydus Medical College and Hospital, Dahod, Gujarat, India.
[3] Assistant Professor, Department of Community Medicine, Zydus Medical College and Hospital, Dahod, Gujarat, India.
[4] Professor & Head, Department of Anatomy, Zydus Medical College and Hospital, Dahod, Gujarat, India.

Corresponding Author:

Dr. Rakesh Kumar

Assistant Professor, Department of Anatomy, Zydus Medical College and Hospital, Dahod, Gujarat, India.

Received: 19-11-2025
Accepted: 10-12-2025
Available online: 18-12-2025

ABSTRACT

Introduction: Cadaveric dissection has long been the cornerstone of medical education, offering a unique, three-dimensional perspective on human anatomy that digital tools cannot fully replicate. However, this traditional practice presents significant physical and psychological challenges, including exposure to chemical irritants and emotional distress. This study aims to analyze the risks, challenges, and best practices associated with cadaveric dissection at Zydus Medical College and Hospital to determine how it can be more effectively integrated into modern medical curricula.

Materials and Methods: A descriptive study was conducted among 200 MBBS students actively participating in dissection sessions. Data were gathered using a structured, pre-validated survey questionnaire designed to evaluate physical, emotional, and educational experiences. Statistical analysis was performed using SPSS version 20 and Microsoft Excel to ensure the accuracy of the findings.

Results: The findings revealed a dichotomy between positive emotional engagement and physical discomfort. While excitement (56.0%) and curiosity (45.5%) were the dominant emotions during first exposure, physical symptoms were nearly universal, with 92.0% of students reporting eye irritation. Post-dissection issues included loss of appetite (38.5%) and disturbed sleep (27.0%). Despite these stressors, 83.5% of students rated the practice as extremely or very effective for learning.

Conclusion Cadaveric dissection remains an indispensable and highly valued educational tool. By implementing targeted improvements in ventilation, hygiene, and emotional support, institutions can mitigate adverse effects and maximize the profound educational and professional benefits of human dissection.

Keywords: *Anatomy Education, Cadaveric Dissection, Medical Students, Formaldehyde Exposure, Educational Challenges.*

INTRODUCTION

Cadaveric dissection has long been considered the cornerstone of medical education, providing students with a unique, hands-on opportunity to explore human anatomy in a tangible and immersive manner. Despite the advent of modern educational technologies, such as virtual simulations and 3D models, cadaveric dissection remains highly valued for its effectiveness in teaching anatomical structures and clinical correlations (1)(2). This practice not only enhances anatomical knowledge but also helps in the development of essential clinical skills, manual dexterity, and professional attitudes such as respect and empathy towards the human body (3)(4).

However, cadaveric dissection presents several challenges that must be addressed to maximize its educational benefits. These include emotional distress experienced by students, safety risks associated with exposure to chemicals such as formaldehyde, and logistical difficulties, such as cadaver procurement and maintenance (5). Additionally, the COVID-19

pandemic has introduced new hurdles by necessitating virtual learning environments, thereby limiting access to traditional dissection sessions (6). These challenges highlight the need for implementing best practices, including pre-dissection counselling, improved ventilation systems, and hybrid learning models that combine dissection with digital tools (7)(8). A complete comprehension of the human body's structure is the basis for successful medical and surgical practice. Cadaveric dissection is central to developing this critical anatomical knowledge (9).

This study aimed to analyse the risks, challenges, and best practices associated with cadaveric dissection in medical education. By exploring both student and educator perspectives as well as recent adaptations in teaching methodologies, this study seeks to provide a comprehensive understanding of how cadaveric dissection can be effectively integrated into modern medical curricula to enhance learning outcomes and professional development

MATERIALS AND METHODS

This study was conducted at Zydus Medical College and Hospital to evaluate student perspectives on the risks and challenges of cadaveric dissection.

Participant Selection

We recruited students currently enrolled in the MBBS program who were actively participating in cadaveric dissection. To ensure data consistency, we excluded any students with prior exposure to dissection or those who chose not to provide informed consent.

Data Collection and Analysis

Quantitative data was gathered using a structured, pre-validated survey questionnaire. This tool utilized Likert-scale and multiple-choice questions to assess the physical, emotional, and educational challenges faced by the students.

Following the collection phase, statistical analysis was performed. We processed the data using SPSS (version 20) and Microsoft Excel to ensure accuracy in our findings.

Ethical Standards

The research was carried out under strict ethical guidelines. All participants were briefed on the study's objectives, and participation remained entirely voluntary, with anonymity guaranteed throughout the data handling process.

RESULTS

Table 1: Demographic Characteristics of the Participants

Variable	Category	Frequency (N)	Percentage (%)
Age Group	18–20	172	86.0
	21–22	19	9.5
	Under 18	9	4.5
Gender	Male	112	56.0
	Female	88	44.0
Total		200	100.0

Table 2: Physical and Emotional Experiences Related to Cadaveric Dissection

Experience Category	Item	Frequency (N)	Percentage (%)
Symptoms During/After Dissection	Eye irritation	184	92.0
	Headache	61	30.5
	Respiratory discomfort	55	27.5

Experience Category	Item	Frequency (N)	Percentage (%)
	Nausea	18	9.0
	Dizziness	13	6.5
Feelings During First Exposure	Excited	112	56.0
	Curious	91	45.5
	Neutral	27	13.5
	Anxious	25	12.5
	Fearful	25	12.5
Post-Dissection Issues	Loss of appetite	77	38.5
	Disturbed sleep	54	27.0
	Anxiety	48	24.0
	Stress	36	18.0

Table 3: Perceived Environmental and Emotional Support Factors

Factor	Response	Frequency (N)	Percentage (%)
Ventilation Quality	Strongly agree	28	14.0
	Agree	78	39.0
	Neutral	63	31.5
	Disagree	25	12.5
	Strongly disagree	6	3.0
Emotional Support Received	Strongly agree	36	18.0
	Agree	101	50.5
	Neutral	51	25.5
	Disagree	7	3.5
	Strongly disagree	5	2.5
Total		200	100.0

Table 4: Students' Perception and Recommendation of Cadaveric Dissection

Measure	Response Category	Frequency (N)	Percentage (%)

Measure	Response Category	Frequency (N)	Percentage (%)
Effectiveness for Learning Anatomy	Extremely effective	68	34.0
	Very effective	99	49.5
	Moderately effective	26	13.0
	Slightly effective	7	3.5
Mandatory Status Support	Strongly agree	117	58.5
	Agree	72	36.0
	Neutral	6	3.0
	Strongly disagree	5	2.5
Recommendation to Future Students	Yes	198	99.0
	No	2	1.0
Total		200	100.0

Table 5: Alternative Learning Methods and Suggested Improvements

Measure	Item	Frequency (N)	Percentage (%)
Helpful Alternative Learning Methods	3D models	170	85.0
	Virtual simulation	86	43.0
	Textbook & diagrams	79	39.5
	Prosected specimens	72	36.0
Suggested Improvements	Better ventilation system	124	62.0
	More guided sessions	104	52.0
	Hygiene maintenance	54	27.0
	Use of safer chemicals	42	21.0

Result

The study involving 200 participants found that the first exposure to dissection was characterized by a dominance of positive emotions, with excitement (56.0%) and curiosity (45.5%) significantly outweighing initial feelings of anxiety or fear (12.5% each). However, physical discomfort was nearly universal, with eye irritation (92.0%) being the most prevalent symptom, followed by headache and respiratory issues. This environmental stressor directly led to the primary recommendation for improvement: a better ventilation system (62.0%).

Post-dissection sequelae included loss of appetite (38.5%) and disturbed sleep (27.0%), alongside sustained anxiety (24.0%) and stress (18.0%). Despite these psychological and somatic challenges, a large majority (68.5%) felt they received adequate emotional support. Crucially, the high cost of the experience did not diminish its perceived educational

value. An overwhelming 83.5% of students rated cadaveric dissection as extremely or very effective for learning anatomy, and 99.0% would recommend it to future students. This confirms the practice's status as an indispensable "gold standard," even while identifying a strong preference for supplemental tools like 3D models (85.0%).

DISCUSSION

The cadaveric dissection experience represents a universally recognized rite of passage in medical education, acting as a crucial foundation for clinical practice while simultaneously introducing significant physical and psychological stressors. A comparative analysis of the present study's findings with the existing literature, including the two uploaded articles, confirms the multifaceted nature of this experience, particularly highlighting common emotional trajectories, consistent environmental challenges, and an overwhelming consensus on the irreplaceable educational value of human dissection.

Emotional Responses and Adaptation to the Cadaver

The emotional landscape of students during their first encounter with a cadaver is often characterized by a dichotomy of positive and negative feelings, a trend clearly reflected in the current data. Our study found that initial positive emotions, such as excitement (56.0%) and curiosity (45.5%), significantly outweighed initial negative feelings like anxiety (12.5%) and fear (12.5%). This finding aligns with several international studies, which report that while students may experience fear, they are generally eager and interested in the dissection process (12,13).

As per Romo-Barrientos et al. provide crucial context regarding the longitudinal emotional impact. The study on health sciences students demonstrated a significant decrease in State Anxiety (SA) levels throughout the course, which suggests that students successfully adapt to the challenging environment over time(10). Similarly, the study focusing specifically on medical students aimed to track attitudes and anxiety over the entire academic year, reinforcing the notion that initial stress is typically a transient phenomenon that is managed through exposure and coping mechanisms. This phenomenon of initial distress followed by emotional adaptation is a common thread throughout the literature, indicating that the educational process effectively facilitates the development of a professional detachment necessary for future clinical roles(11).

Physical Symptoms and Environmental Mitigation

A critical point of convergence between our study and global reports is the prevalence of physical discomfort stemming from environmental factors. In our cohort, eye irritation (92.0%) was the most frequent symptom, followed by headache (30.5%) and respiratory discomfort (27.5%). This is highly consistent with external literature, which overwhelmingly identifies the smell and irritant effects of formaldehyde, the common cadaver preservative, as the primary source of physical distress (14,15). Other studies report high rates of eye watering and bad odor perception on initial entry to the dissection hall (16).

The correlation between physical symptoms and environmental quality is further emphasized by the fact that the most suggested improvement in our study was a better ventilation system (62.0%). This recommendation directly addresses the primary environmental stressor and provides a clear, actionable intervention. This mirrors advice given in multiple published reports, which emphasize that addressing concerns about the dissection hall environment is essential to make the laboratory more conducive to learning and minimize negative experiences (12).

Post-Dissection Sequelae and Educational Value

Beyond the dissection room itself, students in our study reported post-dissection issues, with loss of appetite (38.5%) and disturbed sleep (27.0%) being most common, alongside sustained anxiety (24.0%) and stress (18.0%). These somatic and psychological sequelae, including insomnia and loss of appetite, are well-documented reactions to acute stress and exposure to human cadavers (12,17). The fact that our students reported high levels of adequate emotional support (68.5% agree/strongly agree) is a positive finding and suggests that the institutional support system is functional in aiding students through these challenging periods, a necessity that is strongly recommended by researchers to help students cope with the psychological burden (17).

Crucially, the high emotional cost does not translate into a devaluing of the educational method. The students in our study provided an exceptionally strong endorsement of the practice, with 83.5% rating cadaveric dissection as extremely or very effective for learning anatomy, and 99.0% recommending its continued mandatory status. This data is the most compelling argument in favour of the method, aligning with the international consensus that cadaveric dissection is the "gold standard" due to its ability to provide three-dimensional spatial understanding, tactile experience, and a context for anatomical variability that is difficult to replicate (18). While 3D models were cited as the most helpful alternative (85.0%), this reflects a preference for a hybrid approach to anatomy education, where digital tools enhance visualization without replacing the irreplaceable hands-on experience of dissection (19).

CONCLUSION

Cadaveric dissection continues to hold a central place in anatomy education despite the physical and emotional challenges it presents. Although students commonly experienced discomfort and post-dissection stress, their initial

response was largely positive, driven by curiosity and engagement. The strong perception of adequate emotional support suggests that students are able to adapt when appropriate guidance is available. Most importantly, the overwhelming endorsement of dissection as an effective and indispensable learning method confirms its enduring educational value. Rather than replacing it, targeted improvements in ventilation, hygiene, and guided instruction can reduce adverse effects while preserving the unique strengths of cadaveric dissection.

REFERENCES

1. Sudha K, James J, Natarajan P, Subramanian SP. Unveiling challenges in cadaveric dissection for medical education – a study of student perspectives. Eur J Clin Exp Med. 2024.
2. Ghosh S. Paying respect to human cadavers: We owe this to the first teacher in anatomy. Ann Anat. 2017;211:129-134.
3. Hassan M. Perceptions of medical students undergoing cadaveric training. Zanco J Med Sci. 2016;20:1160-1166.
4. Kaundal AP, Kaundal PK. Perception of students towards cadaveric dissection in a tertiary care teaching institution. Int J Res Med Sci. 2017;5:3684.
5. Onigbinde O, Chia T, Oyeniran O, Ajagbe A. The place of cadaveric dissection in post-COVID-19 anatomy education. Morphologie. 2020;105:259-266.
6. Brassett C, Chilvers N, Lloyd R, et al. Maintaining cadaveric dissection in the COVID era: New perspectives in anatomy teaching and medical education. Eur J Anat. 2021;25:107-116.
7. Schulz C. The Value of Clinical Practice in Cadaveric Dissection: Lessons Learned From a Course in Eye and Orbital Anatomy. J Surg Educ. 2017;74(2):333-340.
8. Yakura T, Hatayama N, Kawahara C, et al. The effect of simulation-based education before a cadaver dissection course. Anat Sci Educ. 2021;15:392-402. Available here.
9. Chaudhari G, Sonawane M, Singel T. Importance of the human cadaveric dissection for learning anatomy by the first year MBBS students: An observational study. Indian Journal of Clinical Anatomy and Physiology. 2020;7(3):177–181. doi:10.18231/j.ijcap.2020.036.
10. Romo-Barrientos C, Criado-Álvarez JJ, González-González J, Ubeda-Bañon I, Flores-Cuadrado A, Saiz-Sánchez D, et al. Anxiety levels among health sciences students during their first visit to the dissection room. BMC Med Educ. 2020;20(1):109.
11. Romo-Barrientos C, Criado-Álvarez JJ, Martínez-Lorca A, Viñuela A, Martin-Conty JL, Saiz-Sanchez D, *et al.* Anxiety among nursing students during their first human prosection. Nurse Educ Today. 2020;85:104269. doi:10.1016/j.nedt.2019.104269
12. Hussein IH, Dany M, Forbes W, Barremkala M, Thompson BJ, Jurjus A. Perceptions of human cadaver dissection by medical students: a highly valued experience. Ital J Anat Embryol. 2015;120(3):162–71.
13. Chia TI, Oyeniran OI, Ajagbe AO, Onigbinde OA, Oraebosi MI. The symptoms and stress experienced by medical students in anatomy dissection halls. J Taibah Univ Med Sci. 2020;15(1):8–13. doi:10.1016/j.jtumed.2020.01.001
14. Kaundal AP, Kaundal PK. Perception of students towards cadaveric dissection in a tertiary care teaching institution. *Int J Res Med Sci*. 2017 Aug;5(8):3684-3687. doi:10.18203/2320-6012.ijrms20173586K.
15. Khan HM, Mirza TM. Physical and psychological effects of cadaveric dissection on undergraduate medical students. J Pak Med Assoc. 2013;63(7):831–834.
16. Getachew D. Reaction of medical students to experiences in dissection room. *Ethiop J Health Sci*. 2014;24(4):337–342. doi:10.4314/ejhs.v24i4.9
17. Javadnia F, Hashemitabar M, Kalantarmahdavi SR, Khajehmougahi N. How to decrease the emotional impact of cadaver dissection in medical students. *J Med Edu*. 2005;7(1):e105172. doi:10.22037/jme.v7i1.846
18. Khodke P (Nemade), Gaddewar R, Satpute C, Ramteke M. Cadaveric dissection versus virtual dissection table: perspective of first year MBBS students. *Int J Life Sci Biotechnol Pharma Res*. 2025;14(4):114–117. doi:10.69605/ijlbpr_14.4.2025.21
19. Shinde AA, Manvikar PR, Patel DK. Virtual online teaching in lieu of cadaveric dissection and traditional learning methods during anatomy classes in the lockdown times of COVID-19: students' perspective. *Indian J Clin Anat Physiol*. 2022;9(2):97–102. doi:10.18231/j.ijcap.2022.023