

# Knowledge, Attitudes, Emotional Responses, and Ethical Perceptions of Phase I MBBS Students Toward Cadaveric Dissection: A Cross-Sectional Study

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## Abstract

**Background:** Cadaveric dissection has been an integral and important part of medical education. The experience of dissection is an unforgettable memory for all medical students. The present study aimed to assess the knowledge, attitude, feelings, and symptoms experience and ethical views of phase 1 medical students towards cadaveric dissection. **Material and Methods:** Cross-sectional, observational study employed a self-designed and pre-validated questionnaire among students of three consecutive batches of Phase I MBBS students, after obtaining permission from the Institutional Ethics Committee and informed consent from the participants. **Results:** A total of 300 students (150 male and 150 female) from consecutive three MBBS batches participated in this questionnaire-based study. The mean age was 19.21 years, and the standard deviation was calculated as 0.911. As far as dissection experience is concerned, 91.33% students felt that it would be a disadvantage if dissection was not attended. More than 85% believed that dissection provides better clinical orientation and helps to recall what is learnt in lectures. Maximum symptoms were formalin related with 90% of formalin odour besides other symptoms like eye irritation, nausea, and loss of appetite. **Conclusion:** Human dissection remains the cornerstone of anatomy teaching. Our study concluded that dissection can be boosted and supplemented by modern teaching techniques but cannot be replaced.

**Keywords:** Medical students, cadaver, dissection, Ethics, Formalin.

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## INTRODUCTION

Anatomy forms the basis of medical education and is fundamental to the understanding of human structure and function. Since the nineteenth century, cadaver dissection has been an integral part of anatomy teaching. It provides a three-dimensional, tactile understanding of anatomical relationships that cannot be adequately replaced by textbooks, plastinated models, or digital resources alone.<sup>[1,2,4]</sup> Cadaver dissection is often the first encounter of medical students with a dead body in its most realistic form. First exposure to cadaveric dissection is often accompanied by diverse emotional responses, psychological and physical, ranging from curiosity and excitement to fear, anxiety, stress, and respect too.<sup>[3,12]</sup> Exposure to cadaver dissection also plays a crucial role in shaping professional attitudes, ethical sensitivity, and empathy among medical students and is an early platform for inculcating medical professionalism.<sup>[10,13]</sup>

In recent years, advances in medical education, such as virtual dissection tables, plastinated specimens, prosected materials, and imaging-based learning have sparked debates over the necessity of cadaver dissection. However, several studies continue to hold that cadaver dissection remains the gold standard for anatomy education.<sup>[4-6]</sup> Hence, the present study was undertaken among Phase I medical students, with these considerations in mind, to assess their attitudes, emotional responses, physical symptoms, and ethical

perceptions regarding cadaver dissection.

## MATERIALS AND METHODS

The present cross-sectional, observational study was conducted at the Postgraduate Department of Anatomy, Government Medical College, Srinagar, Jammu and Kashmir. It was a questionnaire-based study, conducted on Phase I MBBS students from three consecutive academic batches (2022 to 2024). Convenience sampling technique was used and sample size 300 students was obtained with equal sex distribution (150 males and 150 females). A self-designed and validated questionnaire was used.

### Inclusion Criteria

- Phase I medical students who attended cadaver dissection for at least six months
- Students who gave proper informed consent

### Exclusion Criteria

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- Students are not willing to participate
- Incomplete questionnaires

Approval was obtained from the Institutional Ethical Committee. Data were analysed using descriptive statistics. Data were entered into Microsoft Excel and analysed using SPSS 22 software. Continuous variables were expressed as mean ± standard deviation, and categorical variables as frequencies and percentages.

## RESULTS

A total of 300 students participated in the study. The mean age was 19.21 ± 0.91 years, with a minimum age of 18 years. The male-to-female ratio was 1:1. As far as attitudes and experiences toward dissection is concerned, 91.33% of students felt they would be disadvantaged if dissection were not attended, 86.67% reported that dissection helped them to recall lectures, 88% believed that dissection provided better clinical orientation, 81% felt that dissection was still the best

method for learning anatomy and 83.33% believed that dissection provided better learning tool as compared to observing prosected specimens.

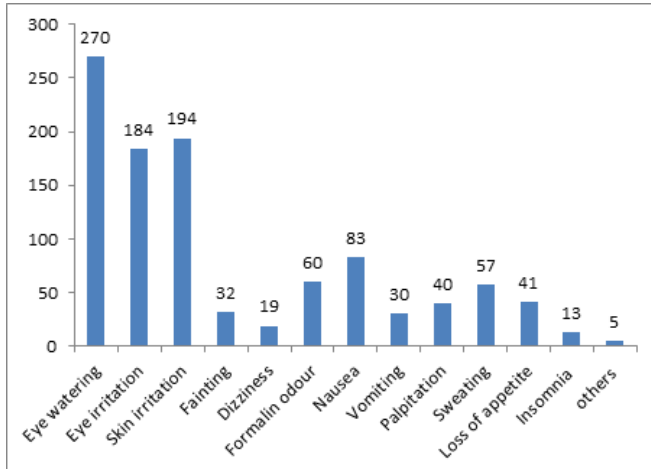
Emotional and Ethical views were 21.67% experienced emotional shock on first exposure, 31.33% had recurrent thoughts about the cadaver even outside the dissection hall, 48.67% considered cadaver dissection ethically acceptable. In comparison, 24.33% were unsure, 96% expressed kind heartedness and regard toward the cadaver, and 85% believed remains of the cadaver should be religiously cremated or buried. As far as physical Symptoms on first exposure are concerned. The most commonly reported symptoms were related to formalin exposure: Formalin odour (90%), Eye irritation (64.67%), watering of eyes (61.33%), nausea (27.67%), and Loss of appetite (13.67%). Less common symptoms included dizziness, palpitations, vomiting, fainting, and insomnia. Overall, the most common complaints were Formalin odour, eye irritation, and nausea. Psychological reactions, such as emotional shock, dizziness, or insomnia, were less frequent.

**Table 1: Distribution of responses to dissection experiences**

S. No	Questions	Yes	No	Not sure
1	Have you ever seen a dead body before first exposure to cadaver?	153(51%)	143(47.67%)	4(1.33%)
2	Did you experience the formalin odour after first exposure to cadaver even when away from college?	84(28%)	198(66%)	18(6%)
3	After first exposure to the cadaver, did you have recurrent thoughts about the cadaver even when away from college?	94 (31.33%)	190 (63.33%)	16 (5.33%)
4	Did you experienced emotional shock upon first being exposed to the cadaver?	65(21.67%)	221(73.67%)	14(4.67%)
5	Has dissection helped you to recall what you learnt in lectures?	260(86.67%)	29(9.67%)	11(3.67%)
6	Do you hesitate to touch the cadaver?	76(25.33%)	202(67.33%)	22(7.33%)
7	Do you try to avoid looking towards cadaver's face and eyes?	79(26.33%)	204(68%)	17(5.67%)
8	Has dissection enhanced your respect towards the human body?	248(82.67%)	35(11.67%)	17(5.67%)
9	Do you think dissection should be replaced by Lectures?	47(15.67%)	241(80.33%)	12(4%)
10	Do you think participating in cadaver dissection provides more opportunities to learn skills than observation of prosected specimens?	250(83.33%)	36(12%)	14(4.67%)
11	Do you think dissection is time consuming and not needed as part of curriculum?	34(11.33%)	264(88%)	2(0.67%)
12	Does dissection provide better clinical orientation?	264(88%)	24(8%)	12(4%)
13	Do you think cadaver dissection is ethically acceptable?	146(48.67%)	81(27%)	73(24.33%)
14	Do you have curiosity and Interest to learn about the structure of human body while dissection?	277(92.33%)	18(6%)	5(1.67%)
15	Do you feel kindheartedness and regard for the cadaver dissected?	228(76%)	40(13.33%)	32(10.67%)
16	Do you feel that you will be disadvantaged if you will not attend dissection?	274(91.33%)	16(5.33%)	10(3.33%)
17	Does dissection potentiate psychomotor skills?	254(84.67%)	22(7.33%)	24(8%)
18	Does dissection provide the best method for learning anatomy?	243(81%)	26(8.67%)	31(10.33%)
19	Do you regard cadaver with sanctity?	238(79.33%)	34(11.33%)	28(9.33%)
20	Do you think remains of cadaver should be religiously cremated/buried?	255(85%)	19(6.33%)	26(8.67%)

**Table 2: Symptoms experienced on first entry into the dissecting room (n=300)**

Symptoms	Yes n (%)	No n (%)
Formalin odour	270 (90%)	30 (10%)
Eye watering	184 (61.33%)	116 (38.67%)
Eye irritation	194 (64.67%)	106 (35.33%)
Skin irritation	32 (10.67%)	268 (89.33%)
Fainting	19 (6.33%)	281 (93.67%)
Dizziness	60 (20%)	240 (80%)
Nausea	83 (27.67%)	217 (72.33%)
Vomiting	30 (10%)	270 (90%)
Palpitation	40 (13.33%)	260 (86.67%)
Sweating	57 (19%)	243 (81%)
Loss of appetite	41 (13.67%)	259 (86.33%)
Insomnia	13 (4.33%)	287 (95.67%)
<b>Others</b>		
Headache	1 (0.33%)	–
Sneezing	2 (0.67%)	–
Scary dreams	2 (0.67%)	–



**Figure 1: Bar chart diagram showing symptoms experienced by medical students in the dissection hall.**

## DISCUSSION

The cadaveric dissection has remained a core activity in undergraduate anatomy computing, especially in the Indian medical curriculum.<sup>[4,6,14]</sup> The current research indicates that students in Phase I of the MBBS program overwhelmingly view dissection as necessary for meaningful learning. Most 91.33% said that it would be unprofitable to be absent from dissection, and 88% said it was giving them more clinical orientation, and 86.67% confirmed they were remembering theoretical ideas. The results are consistent with previously reported evidence that manual dissection leads to better development of three-dimensional thinking and the ability to merge simplified anatomical information with clinical use in the future, as also highlighted by Arraez-Aybar et al. and McLachlan and Patten.<sup>[3,6]</sup>

Regarding applied anatomy, it is curious that the percentage of students 83.33% who believed that active participation improves professional skills, unrelated to the observation of prosected specimens, was so high. The process of dissection also develops spatial reasoning, procedural discipline, and structured thinking 84.67%, qualities necessary in surgical and interventional fields. These results have shown that synthetic tools enhanced by technology add on to anatomy training yet are incapable of fully substituting the sensory experience of learning through the use of cadavers.

Responses with respect to the first encounter were emotional but not intense. Even though 21.67% experienced emotional shock and 31.33% had recurrent thoughts about the cadaver, the majority of the students adjusted over time. This trend reflects the already-reported psychological adaptation mechanisms in initial clinical training. Notably, dissection was a primary experience of mortality that shaped identities as a profession. Most of the students reported that they developed greater respect for the human body 82.67% and the cadaver 79.33% through the use of the dissection hall as a base for developing empathy, ethical sensitivity, and respect for body donations.

Nevertheless, ethical ambivalence is a significant account. And even though 48.67% have deemed cadaveric dissection ethically acceptable, almost a quarter of them

were unsure. This could be because of the perception of some individuals who perceive it as the cutting of a dead body, which is not morally appropriate. This uncertainty is a symptom of the need to adopt a systematic ethics orientation in a sociocultural diverse environment, focusing on body donation, consent, and the humanitarian value of cadaveric donation. Ethical internalization and professional maturation can be further enhanced through the incorporation of donor memorial ceremonies and reflective exercises, as outlined by Pawlina et al. and Rizzolo.<sup>[10,16]</sup>

Formaldehyde exposure also resulted in a significant rate of physical discomfort (e.g., odour perception), and 90% experienced eye irritation and nausea. Even though they were mostly short-lived, these results indicate the need for improved ventilation, better formalin management, and occupational safety protocols in dissection halls. Dealing with environmental conditions might help students feel more relaxed without compromising pedagogical value. Overall, the information confirms that cadaveric dissection is still a pedagogically sound, clinically relevant, and professionally formative tool. In contrast to displace, the results endorse the idea of familiarizing the curricula, i.e., a blending of established dissection with radiological images, virtual organ demonstrations, and prosected demonstrations. Overall, this paper supports the thesis that cadaveric dissection can be considered not only a technique of anatomical teaching but also a powerful workplace experience that can be integrated.

## CONCLUSION

The results confirm the hypothesis of cadaveric dissection, which remains a particularly important educational method regardless of the availability of modern technology. Even though modern teaching methods, such as virtual anatomy systems, radiological and plastinated anatomies, can be useful as supplements to traditional dissection, they can never substitute for the most important educational, ethical, and professional aspect of dissection taught by humans using cadavers: the dissection of human bodies. It was therefore proposed that an integrated pedagogical intervention combining traditional dissection and modern instructional resources be used to recommend the practice to enhance clinical orientation (88%) and knowledge reinforcement (86.7%). Nevertheless, formalin-related discomfort (90%) and ethical uncertainty (24.3%) reveal the necessity of arranging the orientation according to the structure and a better ventilation system.

Pre-dissection orientation counselling and ethical sensitisation should be adjusted; better ventilation and exhaust systems in the dissection hall should be implemented through proper control of formalin.

## Limitations

- Self-reported responses
- No long-term follow-up of participants
- Single-centre study.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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