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Original Article

Perception of Human Cadaver Dissection by MBBS Students of a Medical College in Nepal

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Abstract

Background

Cadaveric dissection has traditionally played a central role in anatomical teaching pedagogy due to being immersive in nature and providing hands-on experience to students. Recent advancements have sparked debates about the replacement of dissection-based learning by the modern technology assisted learning tools in contemporary anatomy curricula. This study aims to systematically explore the perspectives of second- and third-year MBBS students in a Nepali medical college towards the usage of cadaveric dissection as a learning tool in anatomy education.

Materials and Methods

A descriptive cross-sectional study was conducted to explore the perception of MBBS students regarding the dissection. The study included 115 MBBS students currently in their second or third year who have a minimum of one year of experience in cadaveric dissection and have been actively involved in dissection-based learning activities within the last two academic years. A structured, questionnaire comprising 26 Likert-scale items was used to assess the students' perception, attitude, and response to cadaveric dissection. The responses were coded, entered and analysed. Chi-square tests were applied to assess the association between variables.

Results

Out of 115 participants, 73.0% strongly agreed that their first visit to the dissection room was exciting, 86.1% agreed or strongly agreed that dissection deepened their understanding of anatomical concepts, 96% of the students agreed that dissection enhanced their respect for the human body, 93.9% said it made learning more interesting, 92.1% acknowledged that dissection helped them recall what they learned, 88.2% felt it provided them with lasting knowledge and 92.2% acknowledged three-dimensional understanding of body structures gained through dissection. Among the total participants, 94.8% believed they would be disadvantaged if they missed out on dissection.

Conclusion

The findings of this study suggests that cadaveric dissection is perceived by MBBS students as essential and irreplaceable component of anatomy education and should be integrated as learning tool for anatomy curriculum.

Keywords: *Anatomy, Cadaver, Dissection, Perception, Students*

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Introduction

Anatomy has always been one of the basis subjects in medical education essential for the understanding of clinical sciences and safe medical practices [1]. Cadaveric dissection has traditionally played a central role in anatomical teaching pedagogy due to being cost-effective, immersive in nature and providing hands-on experience to students [2]. However, with the introduction of technology-assisted learning tools, such as virtual dissections, plastinated specimens, and 3D anatomical models, anatomical education is experiencing a paradigm shift [3, 4]. Some reformist programs have advocated for complete omission or reduction in allocated time for cadaveric dissections, citing constraints such as limited time, financial burden and lack of cadavers [5, 6].

Alternative tools can definitely enhance the learning experience but they cannot replace the tactile, spatial, and emotional experience gained through cadaveric dissections. Early exposure to dissection can evoke emotional responses ranging from curiosity and excitement to anxiety and aversion [7, 8]. Systematic research on perception of students toward cadaveric dissections is required to evaluate the optimum approach between cadaveric dissections and technology-assisted-learning tools.

This study aimed to assess the perception of 2nd and 3rd year MBBS students toward cadaveric dissection in anatomy education; including positive and negative impact and preferences between cadaveric dissection and alternative learning methods.

Materials and Methods

A descriptive cross-sectional study was conducted to explore the perception of MBBS students regarding the dissection. The study was conducted for one year from May, 024 to June, 025 after receiving the ethical clearance from the institutional review committee (IRC no: 6-2081/82). Informed consent was obtained from all the participants after detail explanation of the study. Participants were informed of their rights, and no identifying information was collected. The study included MBBS students currently in their second or third year who have a minimum of one year of experience in cadaveric dissection and have been actively involved in dissection-based learning activities within the last two academic years.

The sample size was calculated using the Cochran's formula for estimating proportions at a 95% confidence level, a margin of error of 6%, a prevalence of 93% based on a prior Nepalese study on student perceptions of cadaver dissection [9]. The required sample size was 100 which was increased to 115 to account for potential non-responses. Convenience sampling was used to recruit respondents who had already been exposed to cadaveric dissection.

A structured, questionnaire comprising 6 Likert-scale items adapted from Asante EA [10] was used to assess the students' perception, attitude, and response to cadaveric dissection. It included sections on positive and negative experiences, emotional effects, and attitudes toward the continuation or replacement of cadaveric dissection in the curriculum. The products were closed-ended and focused on four general topics featuring eight elements assessing positive experiences, seven factors assessing negative experiences, four regarding emotional impact while seven elements assessing agreeableness of dissection. The survey was transformed into a digital format, Google Form and 115 responses were collected from students of MBBS nd and 3rd year. Participation was voluntary, and confidentiality was maintained throughout the study.

The responses were coded, entered and analyzed using SPSS version 23. Descriptive statistics were used to summarize the data. Chi-square tests were applied to assess the association between variables, with a p-value of <0.05 considered statistically significant.

Results

There was a total of 115 MBBS student participants in the study from a single medical college in Nepal. The participants comprised of 94 (81.7%) second year and 21 (18.3%) third year students. There were 58 (50.4%) female and 57 (49.6%) male participants. In terms of religious identity, majority of students were Hindus (89.6%), followed by Muslims (6.1%), Buddhists (2.6%), and Christians (1.7%). The age of the respondents ranged from 19 to 24 years.

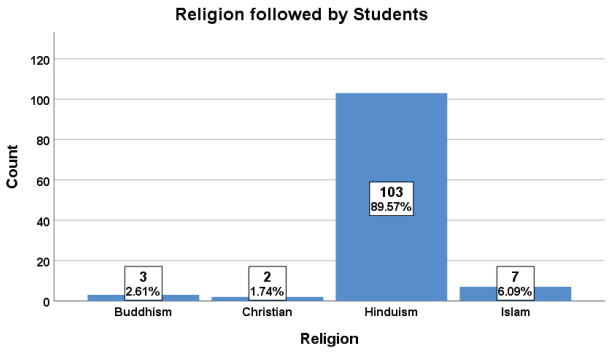

Figure 1: Religion-wise distribution of participants

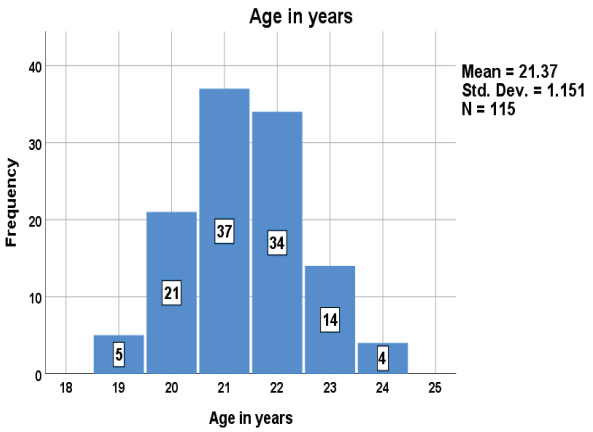

Figure 2: Age-wise distribution of participants

Table 1: Positive perceptions of students about cadaveric dissection

	Strongly agree		Agree		Neutral		Disagree		Strongly Disagree	
	N	%	N	%	N	%	N	%	N	%
My first visit to dissection was exciting	84	73.0%	21	18.3%	6	5.2%	2	1.7%	2	1.7%
Dissection deepened my understanding	62	53.9%	37	32.2%	14	12.2%	1	0.9%	1	0.9%
The dissection enhanced my respect towards the human body	87	75.7%	23	20.0%	3	2.6%	1	0.9%	1	0.9%
Provided better understanding of the effect of trauma	54	47.0%	38	33.0%	13	11.3%	9	7.8%	1	0.9%
Dissection makes learning more interesting	85	73.9%	23	20.0%	5	4.3%	1	0.9%	1	0.9%
The dissection helped me to recall what I learnt	81	70.4%	25	21.7%	6	5.2%	2	1.7%	1	0.9%
Gives me a lasting knowledge	65	56.5%	36	31.3%	10	8.7%	3	2.6%	1	0.9%
Provides a three-dimensional perspective of the structures	70	60.9%	36	31.3%	6	5.2%	2	1.7%	1	0.9%

Table 2: Negative perceptions of students about cadaveric dissection

	Strongly agree		Agree		Neutral		Disagree		Strongly Disagree	
	N	%	N	%	N	%	N	%	N	%
It was difficult locating structures	22	19.1%	29	25.2%	33	28.7%	24	20.9%	7	6.1%
Dissection was stressful	6	5.2%	18	15.7%	30	26.1%	36	31.3%	25	21.7%
I could not differentiate between structures	16	13.9%	25	21.7%	18	15.7%	37	32.2%	19	16.5%
It was time consuming	12	10.4%	26	22.6%	24	20.9%	25	21.7%	28	24.3%
I did not like the smell of formalin	30	26.1%	28	24.3%	32	27.8%	15	13.0%	10	8.7%
I feel dissection is against my culture	2	1.7%	0	0.0%	10	8.7%	12	10.4%	91	79.1%
I feel dissection is against my religion	2	1.7%	1	0.9%	7	6.1%	13	11.3%	92	80.0%

Table 3: Emotional impact of cadaveric dissection on students

	Strongly agree		Agree		Neutral		Disagree		Strongly Disagree	
	N	%	N	%	N	%	N	%	N	%
I had anxiety before during and after my first dissection	6	5.2%	8	7.0%	14	12.2%	21	18.3%	66	57.4%
I prepared mentally for dissection	44	38.3%	31	27.0%	25	21.7%	3	2.6%	12	10.4%
I had a prior exposure to a dead body	14	12.2%	11	9.6%	19	16.5%	11	9.6%	60	52.2%
Prior exposure to dead body helped me	14	12.2%	12	10.4%	22	19.1%	9	7.8%	58	50.4%

Table 4: Acceptance of cadaveric dissection by students

	Strongly agree		Agree		Neutral		Disagree		Strongly Disagree	
	N	%	N	%	N	%	N	%	N	%
I prefer dissection over other forms of learning anatomy	56	48.7%	29	25.2%	17	14.8%	7	6.1%	6	5.2%
I will be disadvantaged if I do not attend dissection	76	66.1%	33	28.7%	5	4.3%	0	0.0%	1	0.9%
More time should be allocated to dissection	57	49.6%	26	22.6%	23	20.0%	8	7.0%	1	0.9%
Dissection should be replaced by lectures, prosections	16	13.9%	9	7.8%	17	14.8%	20	17.4%	53	46.1%
I know cadaver was once a human like me	94	81.7%	18	15.7%	2	1.7%	0	0.0%	1	0.9%
I attend dissection regularly	83	72.2%	26	22.6%	3	2.6%	2	1.7%	1	0.9%
I have respect and empathy for the cadaver	102	88.7%	11	9.6%	1	0.9%	0	0.0%	1	0.9%

Positive Perceptions

Collectively, perception of students towards cadaveric dissection was reported to be strongly positive. Most students (73.0%) strongly agreed that their first visit to the dissection room was exciting. The majority (86.1% agreed or strongly agreed) felt that dissection deepened their understanding of anatomical concepts. The opposite opinion, that of disagreement or strong disagreement, was perceived by only an insignificant proportion of participants, just about 1.8%. Nearly 96% of the students agreed with the opinion that dissection enhanced their respect for the human body. As much as 93.9% said it made learning more interesting. A significant percentage (92.1%) of respondents acknowledged that dissection helped them recall what they learned. Some (88.2%) respondents felt it provided them with lasting knowledge. Many students (92.2%) also marveled at the three-dimensional understanding of body structures gained through dissection.

Negative Perceptions

Some negative perceptions and challenges faced by students were also reported from the survey. Less than half (44.3%) of the total participants found it difficult to locate body structures during dissection and 0.9% reported being stressed by the process. A quarter of students (24.3%) felt that dissection was time-consuming, while as many as half (50.4%) of the students disliked the smell of formalin. Cultural and religious objections to dissection, such as conflict with their culture or religious sentiments, were minimal (only 1.7%).

Emotional Impact

Some of the students reported being affected by anxiety (12.2%) before, during, and after their first dissection. On the contrary, more than half (57.4%) of the participants strongly denied experiencing any anxiety. Most students (65.3%) had prepared themselves mentally for the dissection sessions. A small fraction (only 1.8%) of participants reported prior experience of ever being exposed to a dead body, before their first dissemination. Among those with prior exposure, even a smaller group (22.6%) felt that prior handling of cadaver was indeed helpful in reducing discomfort during dissection.

Acceptance and Attitude

Nearly three fourth (74%) of the participants preferred dissection over other forms of learning anatomy. Almost all but few (94.8%) believed they would be disadvantaged if they missed out on dissection. Almost half of the students (49.6%) wanted more time to be allocated to dissection. When posed with the question whether dissection should be replaced by alternative methods such as lectures or prosections, only 1.7% agreed, while 63.5% disagreed and the remaining were uncertain. Almost all students (97.4%) recognized the humanness of the cadaver. Similarly, almost all (98.3%) stated they had respect and empathy for the cadaver.

Statistical Analysis

The chi-square analysis showed that second- and third-year students differed significantly in their perception of how dissection contributed to a more in-depth understanding of concepts ($\chi^2(4, N = 115) = 10.89$, $p = .025$), better understanding of trauma ($\chi^2(4, N = 115) = 11.87$, $p = .018$), enhanced recall ($\chi^2(4, N = 115) = 11.75$, $p = .019$), and made learning more interesting ($\chi^2(4, N = 115) = 10.09$, $p = .038$). Additionally, discomfort caused by formalin smell ($\chi^2(4, N = 115) = 13.01$, $p = .012$) also differed significantly with the academic year.

A significant gender difference was observed in prior exposure to dead bodies ($\chi^2(4, N = 115) = 11.18$, $p = .024$). No significant relationship was apparent between the religion of students and their belief that dissection contradicts their cultural or religious values, as indicated by the Chi-square test.

Discussion

The aims of this study were to explore the perception of 2nd and 3rd year MBBS students toward cadaveric dissection in anatomy education; to identify its positive and negative impacts; to understand their preferences between dissection and alternative learning methods and to evaluate whether dissection hours should be reduced or not. The results and findings from this perspective research survey strongly suggest that cadaveric dissection remains a highly valued and integral part of anatomy education among medical students in Nepal.

Positive perception of cadaveric dissection reported was a significant majority of participants. Overall, over 90% found it to be exciting or helpful for understanding anatomical structures or beneficial in promoting respect for the human body. This report very well aligns with the findings from other surveys conducted in similar South Asian settings. A study in India by Nayak et al. also revealed that students viewed dissection as essential for three-dimensional understanding and memory retention in anatomy [11]. Similarly, a study conducted in Nepal concluded that most students regarded cadaveric dissection as the gold standard for learning gross anatomy, even when alternative methods like prosections and virtual tools were available [12].

Participants in this research survey appreciated the hands-on experience obtained from dissection and felt that it promoted a deeper and long-lasting understanding of anatomical concepts and knowledge retention. The immersive nature of cadaveric dissections and the resulting perceptions of the participants provides a perfect example of the theory of experiential learning, which emphasizes learning through direct experience as a method of developing practical and cognitive skills [13]. Cadaveric dissections also cultivate respect, empathy, and a deeper admiration for the human body; traits that are expected of future compassionate physicians [14].

Despite the overall positive responses, it is notable that some students did experience

challenges. Around half of the respondents expressed discomfort with the smell of formalin, and nearly one-fourth found the process time-consuming. Similar observations have been made in other studies, where students reported stress or difficulty in locating structures in cadavers [15]. However, in this study, low emotional distress was reported and most students denied experiencing significant anxiety before or during dissections. Moreover, objections to dissection based on cultural or religious beliefs were apparently minimal, indicating that the practice remains culturally acceptable in the Nepali medical academia.

A notable finding was that a large number of students believed they would be disadvantaged if they did not attend dissection sessions. This perception reinforces for the advocacy that cadaveric dissection is irreplaceable by alternative methods. Although modern technology, such as virtual dissection tables and 3D models, offers new dimensions to anatomy teaching, it is evident that these methods are perceived as complementary rather than altogether replacements for traditional cadaveric dissection [16]. Interestingly, only a minority supported replacing dissection with lectures or prosections. This highlights students' awareness of the unique tactile and spatial learning provided by dissection, which cannot be fully replicated by didactic methods or simulations [17]. These findings suggest that dissection hours should not be reduced and instead more time might be allocated to enhance learning. A study in western Nepal by Sharma et al. echoes similar sentiments, reporting that students considered reduced dissection time as detrimental to their anatomical understanding and future clinical application [9]. The observation in this research about the perception of majority of students about dissection being an essential and enriching component of anatomy learning is consistent with other previous works [18,19],

The chi-square analysis further illuminated significant relationships between demographic variables and perception. Notably, students' year of study significantly influenced their responses. For example, second- and third-year students differed significantly in their perception of how dissection contributed to understanding trauma ($\chi^2(4, N = 115) = 11.87$, $p = .018$), enhanced recall ($\chi^2(4, N = 115) = 11.75$, $p = .019$), and made learning more interesting ($\chi^2(4, N = 115) = 10.09$, $p = .038$). These findings may reflect students' evolving academic maturity and exposure to clinical applications as they progress through medical school. Additionally, variation in the discomfort caused by formalin smell ($\chi^2(4, N = 115) = 13.01$, $p = .012$) and understanding gained ($\chi^2(4, N = 115) = 10.89$, $p = .025$) also demonstrates the development of attitude and adaptability of students over academic duration in the context of cadaveric dissection in anatomy education.

Interestingly, regarding prior exposure to dead bodies that influences initial reactions to cadaveric learning, a significant gender difference was observed in ($\chi^2(4, N = 115) = 11.18$, $p = .024$), which could suggest differing societal or cultural experiences with death and dying among the genders. Previous works also suggest that such emotional and cultural contexts play a crucial role in shaping medical students' attitudes towards cadaver dissection [20,21].

These findings emphasize the importance of tailoring anatomy pedagogy based on students' backgrounds and progression. A student-centered approach, considering emotional preparedness and learning preferences, can enhance the effectiveness of dissection as a pedagogical tool. Moreover, while the vast majority of students supported the continuity of cadaveric dissection, a small number found it stressful or culturally challenging, echoing the findings of studies by Azer SA *et al* and Rizzolo LJ *et al*. [22,23].

Despite its strengths, this study has some limitations. First, the sampling technique was non-random (convenience sampling), which may introduce selection bias and affect the generalizability of results. Second, the study relied on self-reported perceptions, which could be influenced by individual experiences or recall bias. Additionally, the study was conducted at a single institution, which may not reflect the perceptions of students across other medical schools in Nepal.

Based on the findings, it is recommended to maintain the dissection hours; incorporate emotional preparedness sessions before the dissection; improve laboratory conditions for better ventilation to minimize discomfort related to formalin exposure. Further study with larger sample size can strengthen the findings of this study.

Conclusion

The findings of this study suggest that cadaveric dissection is perceived as essential and irreplaceable component of anatomy education by MBBS students. It is highly valued for three-dimensional understanding of human anatomy and enhancing clinical correlation. Despite initial

emotional stress and challenges, the perception of participants strongly supports integration of cadaver dissection as learning tool for anatomy curriculum.

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Conflict of interest: None

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