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Perception of Medical Students towards Cadaveric Dissection at a Medical College, Pokhara

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ABSTRACT

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Introduction: Cadaveric dissection remains the gold standard for teaching gross anatomy, yet student perceptions vary, particularly regarding its educational value, emotional impact, and the role of alternative modalities.

Objective: To assess medical student's perceptions of cadaveric dissection in the anatomy dissection hall at a medical college in Pokhara, Nepal.

Methods: A descriptive cross-sectional study was conducted among all first year MBBS and BDS students (n=130). A validated, pretested 32 item questionnaire covered five domains: educational value, negative experiences/formalin burden, emotions/coping, ethics/professional attitudes, and preferences for alternatives. Descriptive statistics, chi square test and logistic regression were used to analyse data.

Results: Of 130 students, 117 participated (response rate 90%). Most agreed that dissection deepened understanding (88.9%), improved retention (86.3%), and provided essential 3-D orientation (83.8%). Negative experiences included dislike of formalin odor (78.6%) and perceived time burden (69.2%). Initial anxiety was reported by 42.7%, with 71.8% noting anxiety reduction after repeated exposure. Respect for cadaver personhood was nearly universal (95.7%). Prior exposure to the deceased significantly reduced high initial anxiety (OR=0.46, p=0.035).

Conclusion: First year students strongly valued cadaveric dissection, preferred it over sole virtual methods, and supported blended resources. Enhancing ventilation, early coping support, and humanistic framing can optimize learning.

Keywords: Anatomy; attitude to death; dissection; psychology; teaching methods.

INTRODUCTION

Cadaveric dissection is a key part of learning anatomy in medical curricula worldwide. It uniquely imparts a three dimensional understanding of human structure which was not fully conveyed by textual or two dimensional resources.[1]

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Studies from educational settings affirm that students perceive dissection as deeper retention and clinical relevance in anatomy learning.[2] Concurrently, many learners encounter early emotional responses such as anxiety, discomfort, or apprehension upon their initial exposure to cadavers.[3] Yet such emotional reactions make students to become accustomed to the dissection and develop coping strategies.[4]

Manipal College of Medical Sciences in Pokhara demonstrated that medical students appraised cadaveric dissection more as a challenge rather than a threat, reflecting adaptation and positive attitude with the learning process.[5] Contemporary studies echo this trend, highlighting predominantly positive perceptions tempered by manageable stressors.[6]

Although these innovations offer advantages in accessibility and safety, that suggests cadaveric learning, especially for tactile and humanistic sensibilities.[7]

Given this backdrop, understanding the perception of medical students in Pokhara regarding educational values, emotional responses and ethical attitudes for guiding and developing of anatomy curriculum.[8] This study specifically assesses student's perceptions across defined domains, with the goal of providing targeted recommendations to integrate traditional cadaveric dissection with complementary modern tools, while maintaining respect for donor humanism.[9]

METHODS

A descriptive cross-sectional study was conducted at the Department of Anatomy, Gandaki Medical College Pokhara, Nepal from January 2025 to July 2025. The study targeted all first year undergraduates MBBS and BDS students after they had completed at least two weeks of cadaveric dissection sessions, ensuring they had initial exposure to the dissection hall and the donor cadavers. Ethical approval was obtained from the Institutional Review Committee of Gandaki Medical College with Approval No.:96/081/082.Written informed

consent was secured from all participants. The study adhered to the Declaration of Helsinki principles, and information on counselling support was provided for students experiencing distress.

The accessible population comprised all 130 undergraduates first-year MBBS and BDS students enrolled in the academic year 2024. A census sampling approach was employed to maximize precision and avoid sampling bias.

To confirm adequacy, Cochran's formula for proportions was applied:

$$n_0 = \frac{Z^2 \times p \times (1 - p)}{d^2}$$

Where, (95% confidence level) Z = 1.96, p = 0.75 (expected proportion with positive perception based on prior studies[12]) and d = 0.07 (absolute precision)

This calculation yielded no ≈ 147. Applying the finite population correction for N= 130

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{N}} \approx 69$$

Since the accessible population exceeded the minimum required sample size, all 130 students were invited to participate. All the first year MBBS and BDS students who had attended at least two dissection sessions were included, while students who were absent during the survey or declined to provide consent were not included. A 32 item self-administered questionnaire was used for data collection.

The adaptation process involved reviewing both instruments for relevant domains, merging overlapping items, rewording them to fit the local cultural and academic context, and adding two check items to detect inattentive responses. The questionnaire covered five domains: educational value (9 items), negative experience/formalin burden (7 items), emotions and coping (7 items), ethics and professional attitudes (5 items), and preferences for alternatives (4 items). Responses were recorded on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree), with negatively phrased items reverse-coded.

Data were collected in the dissection hall immediately after scheduled sessions. Participation was voluntary, anonymous, and non-evaluative. Students returned completed questionnaires into sealed collection boxes to maintain confidentiality.

Data were entered into SPSS version 25 for analysis. Descriptive statistics (means, standard deviations, frequencies, and percentages) summarized responses. Group comparisons (e.g., gender, prior exposure to deceased) were made using chi square or Fisher's exact test for categorical variables and t-test or Mann Whitney U test for continuous variables. Logistic regression was applied to identify predictors of high initial anxiety, reporting odds ratios (OR) with 95% confidence intervals (CI). Significance was set at $p < 0.05$.

RESULTS

In the current study 117 participants (mean age 19.5 years), with a near-equal gender distribution, majority residing in hostels, and a notable proportion reporting vegetarian diet, prior exposure to a deceased body, or recent bereavement. (Table 1)

Table 1: Socio-demographic characteristics of participants.

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	Mean ± SD	19.5 ± 1.2	-
Gender	Male	56	47.9
	Female	61	52.1
Residence	Hostel	80	68.4
	Day scholar	37	31.6
Vegetarian diet	Yes	32	27.4
Prior exposure to deceased	Yes	52	44.4
Recent bereavement (<12mo)	Yes	14	12.0

Most students endorsed the educational value of dissection, citing improved anatomical understanding, retention, and 3D orientation. Negative experiences were primarily related to formalin odor and time demands, while initial anxiety was common but decreased over time. Nearly all participants acknowledged the cadaver as a once-living person deserving respect. (Table 2)

Table 2: Distribution of responses in key perception domains.

Domain	Item	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Educational Value	Deepened anatomical understanding	1.7	3.4	6.0	47.0	41.9
	Improved retention	2.6	3.4	7.7	47.9	38.5
	Provided 3-D orientation	2.6	4.3	9,4	46.2	37.6
Negative	Dislike formalin odor	3.4	5.1	12.8	46.2	32.5

Experience / Formalin	Dissection time-consuming	5.1	8.5	17.1	41.0	28.2
	Initial stress in lab	8.5	12.0	30.8	27.4	21.4
Emotions / Coping	Initial anxiety	10.3	15.4	31.6	23.9	18.8
	Anxiety decreased over time	5.1	6.0	17.1	42.7	29.1
Ethics / Professional	Respect for cadaver personhood	0.0	1.7	2.6	40.2	55.6

Mean domain scores, with the highest ratings for Ethics/Professional Attitudes and Educational Value, followed by Preferences for Alternatives, Emotions/Coping, and Negative Experience/Formalin. (Table 3)

Table 3: Mean domain scores (Likert scale 1-5).

Domain	Mean ± SD
Educational Value	4.23 ± 0.58
Negative Experience/Formalin	3.22 ± 0.71
Emotions/Coping	3.67 ± 0.64
Ethics/Professional Attitudes	4.41 ± 0.52
Preferences for Alternatives*	3.96 ± 0.68

***Higher scores indicate preference for dissection over replacement.**

Prior exposure to a deceased body was significantly associated with lower odds of high anxiety, while gender, vegetarian diet, and recent bereavement were not significant predictors. (Table 4)

Table 4: Predictors of high initial anxiety (logistic regression)

Predictor	OR	95% CI	p-value
Female gender	1.28	0.66–2.49	0.41
Prior exposure to deceased	0.46	0.22–0.95	0.035*
Vegetarian diet	1.54	0.82–2.90	0.09
Recent bereavement (<12 mo)	1.36	0.54–3.44	0.51

***Significant at p < 0.05**

This study of 117 medical students found that dissection was highly valued for its educational benefits, particularly in enhancing anatomical understanding, retention, and 3-D orientation. While formalin odor and time demands were the main negative aspects, initial anxiety was common but decreased with experience. Students strongly endorsed respect for cadaver personhood, and overall domain scores were highest for ethics/professional attitudes and educational value. Logistic regression showed that prior exposure to a deceased body significantly reduced the likelihood of high initial anxiety, whereas gender, vegetarian diet, and recent bereavement had no significant effect.

DISCUSSION

The present study explored first-year medical students' perceptions of cadaveric dissection in an anatomy dissection hall in Pokhara, Nepal. Overall, the findings reveal a strong endorsement of dissection's educational value, a decline in initial anxiety over time, and widespread recognition of the ethical dimensions of working with human donors. These results align with prior work in Nepal and internationally, underscoring the enduring relevance of cadaveric dissection despite the emergence of alternative modalities.[1]

Educational value emerged as the strongest domain, with over 85% of students affirming that dissection deepened understanding, improved retention, and provided essential 3D orientation. Similar proportions have been reported in Ghana, Italy, and Jordan, suggesting a universal appreciation for the spatial, tactile, and contextual knowledge gained through hands-on cadaver work.[2] [4] The mean educational value score (4.23/5) in our study matches reports from other South Asian institutions, indicating consistent regional attitudes despite variations in curriculum structure.[5]

Students' recognition of ethical and humanistic aspects with 95.7% acknowledging the cadaver as a once living person deserving respect reflects effective institutional emphasis on donor dignity. This aligns with studies in the UK and South Korea showing that memorial ceremonies, gratitude sessions, and formal codes of conduct foster empathy and professionalism among anatomy students.[6] [7] Incorporating explicit ethical framing has been shown to improve not only respect for donors but also attitudes toward patients in later clinical years.[8]

The negative experiences domain revealed that dislike of formalin odor (78.6%) and perception of dissection as time-consuming (69.2%) were the most common concerns. These are well documented in anatomy education literature, with chemical irritation and perceived inefficiency frequently cited as drawbacks.[9] [10] Our findings suggest the need for continued investment in ventilation improvements, sealed storage systems, and clear pre lab objectives to minimize non-productive time in the lab.[11]

Regarding emotional responses, 42.7% reported initial anxiety, which decreased for 71.8% after repeated sessions. This mirrors longitudinal studies where the majority of students adapt quickly, transitioning from threat or loss appraisal to a challenge based mindset.[12] Prior exposure to a dead body significantly reduced the odds of high initial anxiety in our sample (OR=0.46), consistent with earlier Pokhara research

demonstrating familiarity as a protective factor.[13] Targeted orientation sessions and gradual exposure could help mitigate early distress, particularly for students without prior contact with deceased individuals.

Attitudes toward alternatives indicated that only 12% favoured replacing dissection with virtual tools, whereas 72.6% supported blended use of digital resources. This is consistent with global trends favouring supplementation rather than replacement.[14] Evidence shows that combining donor based learning with 3D visualization or virtual tables can improve anatomical comprehension, especially for complex regions like the neuroanatomical or pelvic cavity, while maintaining the humanistic benefits of traditional dissection.[15]

Strengths of this study include the census sampling approach, high response rate, use of a literature-informed instrument with demonstrated reliability, and focus on multiple domains (educational, emotional, ethical, and technological attitudes). Moreover, conducting the study in a single cohort allowed for consistent curricular exposure across participants.

However, limitations include its single-institution scope, which may limit generalizability to other Nepalese medical colleges with different teaching methods or facilities. Self-reported data may be subject to social desirability bias, particularly in domains related to ethics and professionalism. The cross sectional design precludes assessment of long term changes in attitudes, though the high early to later anxiety reduction rate suggests adaptation. Additionally, we did not include standardized psychological inventories (e.g., State Trait Anxiety Inventory), which could provide more nuanced insights into emotional trajectories.

CONCLUSION

First year medical students at a Pokhara medical college reported overwhelmingly positive perceptions of cadaveric dissection, valuing its role in enhancing anatomical understanding, retention, and ethical awareness. Institutions should improve laboratory ventilation to reduce formalin-related discomfort and provide structured coping strategies and early orientation sessions to minimize anxiety. Incorporating ethical and humanistic framing, such as donor gratitude activities, is recommended to strengthen professionalism. Multi institutional and longitudinal studies are further needed to validate these results and guide curriculum reforms across Nepal.

Conflict of interest: None

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