DOI: https://doi.org/10.4038/seajme.v19i2.712 **Original Research Paper**

Traditional Cadaver vs Virtual Dissection: Preferences and Effectiveness in Sri Lankan Medical Students

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Abstract

Introduction: Anatomy education traditionally relies on cadaver dissection for immersive, tactile learning. However, shortages of body donations, ethical concerns, and logistical constraints have prompted integration of virtual dissection tools worldwide. In Sri Lanka, cadaver-based instruction remains primary method of learning anatomy, but limited availability and emerging digital alternatives raise questions about student preferences and perceived effectiveness. This study compared traditional cadaver and virtual dissection tools among Sri Lankan medical students, focusing on preferences, perceived learning effectiveness, and ethical considerations.

Methods: A cross-sectional survey was conducted among 150 undergraduate medical students from three government medical faculties in the Western Province. Data were collected via a structured, expert-validated online questionnaire. Descriptive statistics, chi-square tests, t-tests, and ANOVA explored associations between demographics, preferences, and perceptions.

Results: Nearly half of participants (46.7%) preferred cadaver dissection, 34.7% a combined approach, and 18.7% chose virtual tools alone. Confidence was higher among students favoring traditional methods (p=0.001, d=0.65). The combined approach was rated most effective for learning (M=4.08, SD=1.08). Ethical acceptance of cadaver use was high (90.7%), whereas only one-third supported virtual dissection as a replacement. Comfort with cadavers was strongly associated with method preference (χ^2=11.83, p=0.003). Mid-program students most strongly endorsed hybrid learning, reflecting recognition of complementary strengths.

Conclusion: Cadaver dissection remains highly valued in Sri Lankan anatomy education, but virtual tools offer supplementary advantages. Blended learning integrating both methods may optimize experiential depth and flexibility, guiding curriculum development and resource allocation in culturally and resource-sensitive contexts.

Keywords: Anatomy education, blended learning, cadaver dissection, medical students, Sri Lanka, virtual dissection

Introduction

Anatomy is a central field of biology concerned with the structure of the human body, including its organs, tissues, and systems (Blanchard, 2005; Dziedzic *et al.,* 2024).

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Within medical education, it is essential for developing clinical competence, as it helps students to understand spatial relationships between structures, recognize anatomical variations, and link these to disease processes (Abdellatif *et al.,* 2022). For centuries, cadaver dissection has been the principal method and gold standard method for teaching anatomy. Since its establishment as a standard practice in the 17th century, it has been known for providing hands-on and three-dimensional learning, which supports deeper comprehension (Abdellatif *et al.,* 2022; Sinou, *et al.,* 2023). This approach enables direct examination of tissues and the observation of natural variations, skills considered important in surgical and diagnostic training (Cardoso *et al.,* 2023). However, cadaver-based teaching also has limitations, including a shortage of donated bodies, high preservation costs, risks from chemical exposure such as formalin, and ethical challenges related to acquisition and respectful handling (Ghosh, 2017; Varner *et al.,* 2021).

Technological advancements have led to the introduction of virtual dissection platforms, such as 3D anatomy software, virtual reality (VR), and augmented reality (AR), which present detailed and interactive digital models of the human body (Wickramasinghe., 2022). These systems offer advantages including easy access, repeatable practice, and integration with other digital learning resources (Patel *et al.,* 2015; Said Ahmed, 2023). Global evidence emphasized that combining virtual tools with cadaver dissection can improve learning outcomes (Funjan *et al.,* 2023). Still, the absence of tactile interaction limits the value of virtual methods for students developing surgical skills (Cardoso *et al.,* 2023).

In Sri Lanka, cadaver dissection remains the primary mode of teaching anatomy (Chenthuran, 2021; Arudchelvam, 2022). However, the availability of cadavers is often limited due to logistical and financial challenges associated with body donation programs and cadaver preservation (Subasinghe & Jones, 2015; Edirisinghe *et al.,* 2022). Some medical faculties have introduced virtual dissection tools, with evidence from the Faculty of Medical Sciences, University of Sri Jayewardenepure, indicating that 3D anatomy software significantly enhances students' ability to visualize complex anatomical structures (Edirisinghe *et al.,* 2022). Despite these developments, empirical research directly comparing the perceived effectiveness and student preferences for cadaveric versus virtual dissection within the Sri Lankan context remains limited, particularly in relation to cultural, ethical, and practical considerations.

This study addresses the identified research gap by directly comparing perceptions of traditional cadaver dissection and virtual dissection tools among Sri Lankan medical students. It explores perceived learning effectiveness, student preferences, and the influence of contextual factors on the acceptance of each method in anatomy education.

Methods

Study Design and Setting

This study was conducted as a cross-sectional comparative analysis among undergraduate medical students in Sri Lanka. Cross-sectional designs are appropriate for assessing associations and group differences at a single point in time (Wang & Cheng, 2020). It was carried out in three medical faculties located in the Western Province, where both traditional cadaver dissection and virtual dissection tools were available:

- Faculty of Medicine, University of Colombo
- Faculty of Medicine, University of Kelaniya
- Faculty of Medical Sciences, University of Sri Jayewardenepura

These institutions are among the 12 government-recognized medical faculties accredited by the Sri Lanka Medical Council (SLMC) under the Medical Ordinance [Chapter 105 (Sri Lanka Medical Council [(SLMC],). (n.d.). All three faculties employ traditional cadaver-based dissection as the primary instructional method, supplemented by digital learning resources. Virtual anatomy tools such as 3D visualization software and multimedia resources are increasingly integrated into anatomy teaching (Edirisinghe *et al.,* 2022). Cadaver-based teaching remains a fundamental component of anatomy education and provides students with a three-dimensional understanding of the human body (Chandimal *et al.,* 2025). In Sri Lankan medical schools, anatomy practical sessions typically involve cadaveric dissection conducted alongside complementary teaching approaches and emerging educational technologies during the preclinical phase (Chenthuran *et al.,* 2023; Perera *et al.,* 2025). Anatomy instruction during this stage also involves substantial practical exposure to cadaveric material through dissection or prosection sessions integrated with lectures and tutorials, with some curricula allocating over one hundred hours for anatomy practical training (Chandimal *et al.,* 2025).

Study Population and Eligibility Criteria

The study population comprised undergraduate medical students aged 18 years or older.

Students were eligible for recruitment if they were Sri Lankan citizens enrolled in one of the selected government-recognized medical faculties in the Western Province, were currently studying anatomy as part of the undergraduate medical curriculum, had prior experience with both traditional cadaver-based dissection and virtual dissection tools, and were willing to participate by providing informed written consent. For the purposes of this study, virtual dissection tools were defined as digital or computer-based anatomy learning platforms that allow interactive visualization of three-dimensional anatomical structures, including 3D anatomy software, virtual anatomy tables, and digital anatomical simulation platforms (Wickramasinghe *et al.,* 2022; Said Ahmed, 2023). Prior experience was confirmed through a screening question in the questionnaire asking participants whether they had previously used such tools during their anatomy learning sessions.

Sampling and Sample Size

A purposive sampling approach was used to recruit undergraduate medical students studying anatomy in the selected faculties. Recruitment was conducted by distributing the online questionnaire through student academic communication channels, including official student groups and academic mailing lists. Participation was voluntary, and students self-selected to respond to the survey. Eligibility was initially screened through questions confirming enrollment in the selected faculties and exposure to anatomy teaching. Additional questions assessed whether participants had prior experience with cadaver-based dissection and/or virtual anatomy learning tools. This approach allowed the study to capture perceptions from students with varying levels of exposure to different anatomy teaching criteria (Campbell *et al.,* 2020; Nyimbili & Nyimbili, 2024).

The target sample size was 120–150 participants, with an intended distribution of approximately 40–50 students from each participating faculty to ensure representation across institutions. Recruitment invitations were distributed simultaneously across the three faculties, and participation was voluntary. Students self-selected to complete the online questionnaire, and responses were accepted until the target sample size was reached. A total of 150 students completed the survey.

Study Instrument

Data were collected using a structured, self-administered questionnaire developed by the researchers. The questionnaire contained sections on:

- Demographic details (3 items: age, gender, year of study).
- Preferences for anatomy teaching methods (7 items: preferred method, primary reason, engagement, confidence, recommendation, exam preparation, use of both methods).
- Perceived effectiveness of cadaveric and virtual dissection (7 items; 5-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree).
- Ethical considerations (4 items; yes/no responses on comfort, ethical justification, replacement by virtual tools, and preference if both methods available).
- Perceived advantages and disadvantages of each method (8 items; multiple-choice questions on benefits, challenges, and perceived effectiveness of traditional and virtual methods).

The questionnaire was close-ended with predefined response options to ensure consistency in responses. The questionnaire was prepared in English, reviewed by subject experts for content accuracy, and pilot-tested among 10 undergraduate medical students from a medical faculty not included in the final study sample to ensure clarity and reliability.

Data Collection

The questionnaire was distributed online via Google Forms to eligible participants. The study information sheet and consent form were provided at the start of the questionnaire. Data collection was open for four weeks, with periodic reminders sent to increase the response rate. Participation was voluntary, and responses were anonymous. Although purposive inclusion criteria were applied to ensure participants had experience with both cadaver-based and virtual anatomy learning methods, recruitment relied on voluntary participation through online distribution and therefore also reflects elements of convenience sampling.

Data Analysis

Data were analyzed using JASP version 0.19.3.0. Descriptive statistics summarized demographic characteristics, preferences, and perceptions. Chi-square tests assessed associations between categorical variables Independent t-tests and one-way ANOVA compared means between groups. These tests were selected because they are suitable for categorical and normally distributed continuous data, respectively. Cronbach's alpha assessed internal consistency of questionnaire items. Content validity was established through expert review and pilot testing

Ethical Considerations

Ethical approval was obtained from the Ethical Review Committee of the International Institute of Health Sciences, Sri Lanka (Application No: BI_ERC_2024_189; Date: 20.01.2025). The research was conducted in accordance with the approved proposal. Written informed consent was obtained electronically from all participants via the online Google Form. Participants were required to provide consent at the beginning of the form; only those who selected the consent option were allowed to proceed to the questionnaire. Confidentiality and anonymity were maintained by removing identifying information and securely storing all data.

Study Duration

The study was conducted from the end of January 2025 to April 2025.

Results

A total of 150 undergraduate medical students from three medical faculties in the Western Province participated in the study. The majority of participants were aged 20–25 years (74.7%), with males representing 56.0% and females 44.0%. Most students were in their third year of study (41.3%), followed by second-year students (26.7%) (Table 1).

Dissection method preferences

Nearly half of participants preferred traditional cadaver dissection (46.7%), one-third chose a hybrid of cadaver and virtual methods (34.7%), and the remainder favored virtual tools alone (18.7%). The leading reason for selecting cadaver work was its hands-on learning experience (65.3%). Among students who had used both approaches, confidence was highest with cadaver dissection (50%), while only 14.4 % felt more confident with virtual tools and 35.6% reported equal confidence with both (Table 2).

Table 1: Demographic characteristics of respondents (N=150)

Characteristic	Category	Number (n)	Percentage (%)
Age Group	Below 20	4	2.7%
	20-25	112	74.7%
	26-30	32	21.3%
	Above 30	2	1.3%
Gender	Male	84	56.0%
	Female	66	44.0%
Year of Study	1st Year	23	15.3%
	2nd Year	40	26.7%
	3rd Year	62	41.3%
	4th Year	15	10.0%
	5th Year (Final)	10	6.7%

Note: Percentages are calculated based on the total sample size (N=150).

Table 2: Dissection method preferences and perceptions

Variable	Category	Number (n)	Percentage (%)
Preferred Method	Traditional	70	46.7
	Virtual	28	18.7
	Both equally	52	34.7
Primary Reason	Hands-on experience	98	65.3
	Visual clarity	25	16.7
	Accessibility	27	18.0
Experience with Both	Yes	90	60.0
	No	60	40.0
Confidence (if used both)	Traditional	45	50.0
	Virtual	13	14.4
	Both	32	35.6

Note: Students clearly value the tactile experience of cadaver work, which appears to build greater confidence than virtual tools alone

Perceptions of learning effectiveness

The Likert-scale results highlighted nuanced perceptions of learning effectiveness (Table 3). Students agreed most strongly that a combined approach of both methods provides the best learning experience (M=4.08, SD=1.08). High ratings were also given to the role of cadaver dissection in increasing confidence (M=3.89, SD=1.19) and improving 3D visualization (M=3.82, SD=1.17). Virtual methods were rated as particularly useful for simplifying revision (M=3.75, SD=1.12) and improving retention (M=3.58, SD=1.15). Overall, the findings suggest that students recognized the complementary value of both methods.

Reliability analysis of the 7-item perception scale demonstrated good internal consistency (Cronbach's α=0.782), confirming the suitability of the instrument for measuring perceived effectiveness.

Table 3: Perceptions of learning effectiveness; Likert scale items (1-5 scale)

Perception Statement	Mean (M)	Standard Deviation (SD)
Traditional cadaver dissection enhances understanding of anatomy better than virtual tools	3.42	1.21
Virtual tools are effective in improving knowledge retention.	3.58	1.15
Combining both methods offers the best learning experience.	4.08	1.08
Traditional dissection improves visualization of 3D anatomical relationships.	3.82	1.17
Virtual tools simplify independent revision.	3.75	1.12
Cadaver dissection significantly impacts confidence in clinical anatomy application.	3.89	1.19
Virtual tools provide clarity for understanding anatomical variations.	3.41	1.24

Note: Although the 5-point Likert scale is ordinal, responses are treated as approximately interval to calculate mean and standard deviation. This approach is commonly used in perception studies to summarize central tendency and facilitate comparison across items (Norman, 2010).

Ethical Perceptions

Ethical considerations were strongly in favor of cadaver-based learning. A majority of participants reported being comfortable with cadavers (92.0%) and believed their use was ethically justified (90.7%). However, only 34.0% of respondents felt that virtual dissection could replace cadavers, and just 26.0% stated that they would prefer virtual methods if both were available (Table 4).

Associations between demographics and preferences

Chi-square tests revealed several significant associations. Gender and preferred dissection method were significantly associated (χ^2=6.24, p=0.042). Males were more likely to prefer traditional dissection (50%), whereas females demonstrated higher preference for virtual (21.2%) or both methods (36.4%) (Table 5).

Table 4: Ethical Perceptions (N=150)

Statement	Yes (%)	No (%)
Are you comfortable using cadavers for educational purposes?	92.0	8.0
Do you consider cadaver use ethically justified in anatomy education?	90.7	9.3
Could virtual tools replace cadavers without affecting education quality?	34.0	66.0
Would you prefer virtual tools over cadavers if both options were available?	26.0	74.0

Note: Despite access to technology, students overwhelmingly regard cadaver-based learning as ethically acceptable and essential.

Table 5: Gender × Preferred Dissection Method

Gender	Traditional	Virtual	Both	Total	p-value
Male	42 (50.0%)	14 (16.7%)	28 (33.3%)	84	0.042
Female	28 (42.4%)	14 (21.2%)	24 (36.4%)	66	

Note: Female students demonstrated greater openness to virtual or hybrid methods than males.

Year of study and recommended method also showed a significant association (χ^2=14.56, p=0.021). Early-year students leaned toward traditional dissection, while third-year students favored a combined approach (41.9%). Final-year students reverted to preferring cadaver dissection (60%) (Table 6).

Comfort with cadavers strongly predicted method preference (χ^2 = 11.83, p = 0.003). Students uncomfortable with cadavers preferred virtual tools (50%), whereas comfortable students favored traditional methods (49.3%) (Table 7).

Group differences in perceived effectiveness

Independent sample t-tests revealed (Table 8) that students who preferred traditional dissection reported significantly higher confidence compared to those favoring virtual methods (t (96)=3.42, p=0.001, d=0.65). No significant gender differences were found in perceptions of virtual tool effectiveness (p=0.265). Students who were comfortable with cadavers rated traditional methods as more effective for 3D visualization (t (148)=2.87, p=0.005, d=0.52).

Year-based differences

One-way ANOVA demonstrated significant year-based differences in perceptions of hybrid learning (F (4,145)=3.87, p=0.005, η^2=0.10) (Table 9). Post-hoc comparisons indicated that third-year students endorsed hybrid learning more strongly than first-year (p=0.008) and final-year students (p=0.013). Additionally, method preference groups differed in their ratings of 3D visualization (F (2,147)=5.91, p=0.003, η^2=0.07), with both traditional and hybrid learners rating it higher than virtual-only learners (Table 9).

Table 6: Year of Study × Recommended Method

Year	Traditional	Virtual	Both	Total	p-value
1st	12 (52.2%)	4 (17.4%)	7 (30.4%)	23	0.021
2nd	18 (45.0%)	7 (17.5%)	15 (37.5%)	40	
3rd	24 (38.7%)	12 (19.4%)	26 (41.9%)	62	
4th	8 (53.3%)	3 (20.0%)	4 (26.7%)	15	
5th	6 (60.0%)	2 (20.0%)	2 (20.0%)	10	

Note: Preference shifts across training; hybrid learning peaks mid-program, while early and late years students favor cadaver dissection.

Table 7: Comfort with Cadavers × Preferred Method

Comfort	Traditional	Virtual	Both	Total	p-value
Yes	68 (49.3%)	22 (15.9%)	48 (34.8%)	138	0.003
No	2 (16.7%)	6 (50.0%)	4 (33.3%)	12	

Note: Discomfort with cadavers strongly predicts a preference for virtual dissection.

Table 8: Independent samples t-tests comparing Likert-scale responses between groups

Research Question	Group Comparison	t(df)	p-value	Mean Difference	95% CI	Cohen's d	Interpretation
Do traditional dissection users report higher confidence?	Traditional (n=70) vs. Virtual (n=28)	t (96) =3.42	0.001	+0.81	[0.34,1.28]	0.65	Traditional users report significantly greater confidence.
Does gender affect perceived virtual tool effectiveness?	Male (n=84) vs. Female (n=66)	t (148) =1.12	0.265	+0.19	[-.15,0.53]	0.18	No significant gender difference.
Is comfort with cadavers linked to 3D visualization ratings?	Comfortable (n=138) vs. Uncomfortable (n=12)	t (148) =2.87	0.005	+0.72	[0.22,1.22]	0.52	Comfortable students rate traditional visualization higher.

Note: Comfort with cadavers enhances both confidence and perceived 3D-visualization skills.

Table 9: One-way ANOVA results comparing Likert-scale responses across groups

Research Question	Groups Compared	F(df)	p-value	η² (Effect Size)	Post-Hoc Comparisons (Tukey HSD)	Key Finding
Do year groups differ in hybrid learning endorsement?	1st (n=23) 2nd (n=40) 3rd (n=62) 4th (n=15) 5th (n=10)	F (4,145) =3.87	0.005	0.10 (medium)	3rd > 1st (p=0.008) 3rd > 5th (p=0.013)	Mid-program students most endorse hybrid.
Does age affect virtual tool confidence?	<20 (n=4) 20-25 (n=112) 26-30 (n=32) 30+ (n=2)	F (3,146) =1.24	0.298	0.03 (small)	N/A (ns)	No significant age differences.
Does preference group affect 3D visualization ratings?	Traditional (n=70) Virtual (n=28) Both (n=52)	F (2,147) =5.91	0.003	0.07 (medium)	Traditional > Virtual (p=0.002) Both > Virtual (p=0.038)	Virtual users rate 3D visualization lowest.

Note: Third year students show the strongest support for blended cadaver-virtual dissections, and cadaver exposure improves perceived spatial skills.

Correlations between perceptions and outcomes

Spearman correlation analysis revealed a moderate positive correlation between perceived effectiveness and confidence (ρ=0.42, p=0.001). No significant correlations were observed between perceived effectiveness and year of study (ρ=0.18, p=0.072) or age (ρ=-0.05, p=0.587).

Table 10: Correlations between Perceived Effectiveness and Key Variables

Variable Pair	Correlation Coefficient (r)	p-value	Interpretation
Total Effectiveness × Confidence	0.42	0.001	Strong positive relationship.
Total Effectiveness × Year of Study	0.18	0.072	No significant correlation.
Total Effectiveness × Age	-0.05	0.587	No relationship.

Note: Greater perceived learning effectiveness is directly linked to higher confidence, independent of age or academic year.

Therefore, the findings suggest that integrating cadaveric dissection with high-quality virtual resources may provide a more comprehensive learning experience for medical anatomy education based on student perceptions. A combined approach may allow students to benefit from the strengths of both traditional and digital teaching methods in anatomy learning.

Discussion

This study explored preferences and perceptions regarding traditional cadaver dissection and virtual dissection tools among medical students from 3 medical schools in Sri Lanka. Although students appreciated the convenience and enhanced visualization offered by digital platforms, cadaver-based learning remained central for confidence development and spatial understanding. Blended learning, combining cadaveric and virtual methods, was rated highest for overall learning effectiveness, particularly among mid-program (third-year) students, suggesting that integration of both methods may provide the most comprehensive learning experience.

Comparative context and cultural nuances

Cadaver dissection has long been regarded as the "gold standard" for anatomy education (Abdellatif *et al.,* 2022; Sinou *et al.,* 2023; Șișu *et al.,* 2024), because of its tactile depth and three-dimensional realism (Arudchelvam, 2022; Cardoso *et al.,* 2023; Sinou *et al.,* 2023). International literature shows that virtual resources can substantially enhance accessibility and targeted visualization (Patel *et al.,* 2015; Wickramasinghe *et al.,* 2022; Said Ahmed, 2023). Yet, compared with reports from the United Kingdom, United States, and parts of East Asia, where over half of surveyed students have accepted fully virtual anatomy curricula post-pandemic, only 26% of Sri Lankan students indicated they would prefer virtual dissection if cadaver sessions were also available. This contrast highlights a distinctive cultural context in which direct interaction with human cadavers is closely linked to academic rigor and ethical duty (Subasinghe & Jones, 2015; Arudchelvam, 2022; Edirisinghe *et al.,* 2022). Limited national access to sophisticated digital platforms may also reinforce the perception that technology serves best as a supplement rather than a replacement.

Interpretation of patterns and variations

The preference for cadaveric methods may reflect cultural and pedagogical values, as Sri Lankan medical education has deep roots in traditional practices (Subasinghe & Jones, 2015; Arudchelvam, 2022; Edirisinghe *et al.,* 2022). In our study, students emphasized the hands-on experience of dissection as a primary reason for their preference, highlighting the high value placed on direct anatomical exposure. Virtual cadaver tools likely appeal due to their logistical advantages, such as flexibility in scheduling and ease of repetition, particularly in institutions with limited cadaver availability (Yun *et al.,* 2024; Hammouda, Maoua and Bouchahma, 2025). The observed preference for a hybrid approach suggests that students value both the hands-on experience of dissection and the flexibility of digital resources.

It is also possible that virtual cadaver tools reinforce cognitive learning when used alongside cadaver labs, enhancing memorization and spatial understanding (Hammouda *et al.,* 2025; Yoon, 2025). Conversely, when used in isolation, virtual tools may lack the sensory and emotional engagement that cadaver-based learning provides (Chen *et al.,* 2020; Kavvadia *et al.,* 2023; Hammouda *et al.,* 2025; Wang *et al.,* 2025).

Strengths and original contributions

This study contributes to the limited research in Sri Lanka on medical students' views of cadaveric versus virtual anatomy teaching methods (Arudchelvam, 2022; Udhayakumar *et al.,* 2022; Kavvadia *et al.,* 2023). By documenting student preferences and perceived learning outcomes, it provides culturally relevant evidence that informs medical education discourse in Sri Lanka. These insights can guide educators and curriculum developers in designing balanced, pedagogically informed teaching strategies that incorporate multiple modalities.

Practical implications for curriculum and policy

The findings support a strategically designed hybrid approach that preserves cadaver dissection while leveraging virtual resources. Medical education programs develop a deliberately structured hybrid curriculum that maintains hands-on cadaver experience as the foundational component, complemented by digital technologies to optimize learning efficiency and preparedness for patient care.

Concrete actions for educators and policymakers include:

- Structured pre-lab preparation: Require students to complete virtual modules before each dissection session so that cadaver time is devoted to deeper exploration and clinical correlation.
- National shared virtual platform: Develop or license a central 3-D anatomy resource, coordinated through the University Grants Commission or Ministry of Health, to reduce cost and ensure equitable access across faculties.
- Flipped laboratory model: Encourage digital preview of anatomical regions so that in-person labs can emphasize tactile engagement and critical discussion.
- Inter-faculty resource sharing: Establish agreements for cross-institutional access to cadaver facilities and virtual content, helping address cadaver shortages.
- Faculty development: Provide targeted training so instructors can integrate digital tools into active, student-centered learning environments.

These steps would maintain the indispensable experiential value of cadaveric learning while broadening access to modern educational technologies.

Limitations

This study's cross-sectional design captures preferences at a single time point and cannot track longitudinal changes. Participants were purposively sampled from three universities and all had prior experience with both cadaveric and virtual dissection tools, ensuring relevance to the research question; however, this sampling approach may still limit representativeness and external validity, restricting generalizability to all Sri Lankan medical students (Memon *et al.,* 2024). Reliance on self-reported perceptions introduces potential response bias, and variations in cadaver and digital resources across institutions may have influenced findings. Nonetheless, student perceptions remain a critical indicator of effectiveness of learning methods.

Directions for future research

Future studies should:

- Conduct on longitudinal analyses to follow preference changes throughout medical training.
- Compare objective learning outcomes among cadaver-only, virtual-only, and hybrid cohorts.
- Use qualitative interviews or focus groups to explore cultural and emotional dimensions of cadaveric learning.
- Examine demographic subgroups (e.g., gender, academic year) to identify differential impacts and guide targeted interventions.
- Adopt random sampling strategies or multi-center recruitment to improve representativeness and generalizability of findings.

Conclusion

Sri Lankan medical students perceive that cadaveric dissection is essential for mastering anatomy, providing hands-on experience, supporting three-dimensional understanding, and fostering confidence and ethical awareness in anatomy learning. While virtual tools are valued as effective supplements; particularly for revision, visualization, and addressing resource limitations; they are not viewed as replacements for cadaveric experience. These findings suggest that a hybrid approach, combining cadaveric training with high-quality digital resources, may be considered in medical education to enhance efficiency, equity, and scalability, while respecting cultural norms and mitigating resource disparities. This approach respects cultural norms, mitigates national resource disparities, and aligns Sri Lankan anatomy education with contemporary best practices in medical training.

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Data availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request, subject to ethical and privacy considerations.

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