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Comparative effectiveness of cadaveric dissection versus anatomical models in teaching anatomy: A global analysis focused on medical schools in low and middle – income Countries versus High-Income Countries: A systematic review

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Abstract

Background: The general trends and issues related to anatomy teaching in medical schools, with a focus on the comparison between low and middle-income countries (LMICs) and high-income countries (HICs) is a huge topic in medical education history as arguments about effectiveness o the methods and instruments of the teaching is constantly discussed. There are significant disparities in anatomy teaching between HICs and LMICs, primarily driven by differences in resources and infrastructure.

Aim: This systematic review aims to analyze the comparative effectiveness of cadaveric dissection versus anatomical models in teaching anatomy. The primary focus of this study is to assess the feasibility and practicality of employing cadaveric dissection versus anatomical models in resource-constrained settings Examine students' perception and satisfaction with learning experience when taught anatomy using cadavers or anatomical models, Compare the outcomes and experiences of teaching anatomy with cadavers or models in medical schools and Evaluate the cultural and ethical aspects influencing the choice between cadaveric dissection and anatomical models in medical education.

Method: A comprehensive search strategy was employed to identify relevant studies published in peer-reviewed journals, conference proceedings, and grey literature databases. Inclusion criteria encompassed articles reporting on of cadaveric dissection versus anatomical models in teaching anatomy.

Conclusion: The comparative effectiveness of cadaveric dissection and anatomical models in teaching anatomy is a complex and multifaceted issue, with considerations extending beyond educational outcomes to encompass economic, logistical, and ethical dimensions. While both methods have their merits, medical schools in LMICs face distinct challenges that require innovative solutions.

Keywords: Medical education; Medical students; Cadaveric dissection; Anatomical models; Teaching anatomy

1. Introduction

[1] The pedagogical methodologies employed in medical education, particularly in the realm of anatomy teaching, have been the subject of ongoing scrutiny and evaluation, (Foo, et al., 2022). A pivotal aspect of this discourse centers on the comparative effectiveness of two prominent teaching modalities: cadaveric dissection and anatomical models. This study seeks to conduct a comprehensive global analysis, discerning the nuances of these instructional approaches in medical schools across diverse economic landscapes.[2] The juxtaposition of medical schools in high-income countries (HICs) against those in low and middle-income countries (LMICs) forms the crux of our investigation, as we delve into

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the intricate interplay between available resources, cultural considerations, and educational outcomes, (Lim, At, Brown, & Karnik, 2020).

[3] In high-income countries, medical education is often characterized by well-established infrastructures, robust financial support, and access to cutting-edge technologies, Sedrakian, A. K., & Johnson, A. (2021). Cadaveric dissection, a traditional cornerstone of anatomy instruction, is typically bolstered by state-of-the-art facilities, well-preserved cadavers, and a cadre of experienced faculty. [4] In contrast, anatomical models, ranging from two-dimensional illustrations to three-dimensional replicas, may complement dissection-based learning, offering additional visual aids and interactive tools, (Grigorieff, N et al., 2017). [5] The emphasis on technology-enhanced learning is notable, with virtual dissection tools and 3D anatomical models contributing to a dynamic and immersive educational experience, (Acharya, N. R et al., 2018).

Conversely, medical schools in low and middle-income countries contend with distinct challenges that can significantly impact the efficacy of anatomy education. [6] Resource limitations, both in financial terms and access to cadavers, pose constraints on the traditional cadaveric dissection approach, (Torkkola, M et al., 2020). In such settings, anatomical models, which can be more cost-effective and logistically manageable, may emerge as viable alternatives. Moreover, considerations of cultural and ethical dimensions play a pivotal role in shaping the anatomy curriculum, influencing the preference for one teaching modality over the other. [7] As medical education strives to transcend geographical boundaries, this study aims to unravel the intricate tapestry of anatomical instruction by examining the comparative effectiveness of cadaveric dissection and anatomical models, Bhutani, S., & Rispler, I. (2016).

By scrutinizing medical schools in HICs and LMICs, we seek to identify trends, challenges, and innovative solutions that contribute to the ongoing discourse on enhancing anatomy education globally. This exploration is not merely an academic exercise but a crucial step toward fostering educational equity and ensuring that aspiring medical professionals worldwide receive a comprehensive and impactful anatomy education.

2. Research Method

It is crucial to analyze comparative effectiveness of cadaveric dissection versus anatomical models in teaching anatomy: A global analysis focused on medical schools in low and middle –income countries versus high-income countries. It explains comparative effect of cadaveric dissection versus anatomical models in teaching anatomy. Richardson et al., (1995) proposed the use of our-part model to facilitate searching or a precise answer, they stated that a clinical question must be formulated and well-articulated for all our parts of its anatomy: a patient, population or problem (P), an intervention or exposure (I), a control and clinical outcome of interest (O). The PICO population, intervention, control and outcomes format is considered a widely known strategy for framing a foreground research question

2.1. Project research design & methodology

This systematic review of the literature's reported findings on assessment of comparative effectiveness of cadaveric dissection and anatomical models in teaching anatomy aims to identify, assess, and comment on these findings. In order to better understand the effectiveness of cadaveric dissection and anatomical models in teaching anatomy. Systematic literature is an important tool for analyzing data and the influence assessment of effectiveness of cadaveric dissection and anatomical models in teaching anatomy. Based on published research, especially in the health area

2.2. Search strategy & inclusion & exclusion criteria

The systematic review in this study employed the PICO (population, intervention, comparison and outcome) framework, [62] The *Cochrane Handbook for Systematic Reviews of Interventions* specifies using PICO as a model for developing a review question, thus ensuring that the relevant components of the question are well defined, (Higgins et al., 2008). The PRISMA reporting checklist was followed. The following are the search keywords for this component: Population: The search words used for this component determine location that will be investigated. The location, group, and other characteristics of this population may or may not be present. The cohorts being investigated in this instance are the anatomy teaching in medical students of middle and low income countries (LMICs) and high income countries (HICs).

Intervention is the phrase used to define the treatments or strategies work best to improve outcomes and making a difference.[63] It was thus claimed that with a PICO-based research question, one can only generate study designs that detect correlations between a treatment and a desired outcome (Andreas Nishikawa-Pacher, 2022).The intervention in this study is cadaveric dissection as a method teaching anatomy.

Comparison refers to the alternative interventions or exposures compared with the one being investigated. The comparison in this study is anatomical models as an alternative method or teaching anatomy.

The Outcome is the predicted result that should be visible, measurable, or detectable in the population under observation. In this study, the outcome is comparative effectiveness in terms of student's understanding, retention, and overall educational outcome in anatomy.

[64] Effective anatomy teaching outcome is seen on student's retention and knowledge discharge. Based on the research perspective that this systematic review gave the framework for primary articles was used (Pollock and Berge, 2018.

Table 1 Inclusion/Exclusion Criteria

S/N	PICO	Inclusion Criteria	Exclusion Criteria
Population (P):	The anatomy teaching in medical students of middle and low income countries (LMICs) and high income countries (HICs).	Studies conducted on anatomy teaching in medical schools In middle and low income countries (LMICs) and high income countries (HICs).	Studies conducted general medical Teachings.
Intervention (I):	Cadaveric dissection as a method teaching anatomy.	Studies that investigate anatomy Teaching interventions in medicals	Studies that do not focus on interventions explicitly designed to improve anatomy teaching in medical schools.
Comparison (C):	anatomical models as an alternative method Of teaching anatomy.	Study Design: Peer-reviewed primary research studies, including randomized controlled trials (RCTs), quasi-experimental studies, observational studies, and other study designs reporting quantitative or qualitative data.	Study Design: Non-peer-reviewed studies, conference abstracts, reviews, editorials, and commentaries. Studies with a high risk of bias or methodological flaws.
Outcome (O):	Comparative effectiveness in terms of student's understanding, retention, and overall educational outcome in anatomy.	Outcome Measures: Studies that report on outcomes related to anatomy teaching Other relevant indicators.	Outcome Measures: Studies that do not report relevant outcomes related to anatomy teaching.
Time (T):	Time frame for the intervention and outcome	Publication Language and Date: Studies published in the English language. Studies done in the last 15 years, to capture a comprehensive range of studies.	Publication Language and Date: Studies published in languages other than English. Studies published before the last 10-15 years

Pertinent literatures in all of the EBSCO e-bases (research gate, Cochrane, web of science, PsycheInfo, Goggle scholar, Pubmed central and Medline etc.) were sought for and a wide range of them assessed the comparative effectiveness of anatomy teaching in medical schools of low and high income countries.

Table 2 Summary of Database Query Strategy

SS/N	PICO	Research Definition	Search Terminology
#1	Population	The anatomy teaching in medical schools of middle and low income countries (LMICs) and high income countries (HICs).	"Anatomy teaching in medical students of middle and low income countries (LMICs) and high income countries (HICs). " OR "anatomy teaching in medical students"
#2	Intervention	Cadaveric dissection as a method teaching anatomy.	"Cadaveric dissection as a method teaching anatomy" OR "method of teaching anatomy"
#3	Outcome	Comparative effectiveness in terms of student's understanding, retention, and overall educational outcome in anatomy.	"Comparative effectiveness in terms of student's understanding, retention" OR "overall educational outcome in anatomy"
44	Comparison	Anatomical models as an alternative method Of teaching anatomy.	"Anatomical models as an alternative method of teaching anatomy"
4	PICO		

In the screening process, the researchers read the title/abstract and then read the full article. The screening and selection process was utilized once the record was collected to make sure that only studies that matched the inclusion/exclusion criteria were included.

2.3. Data Extraction and Analysis

[68] After being chosen, pertinent data was retrieved using Microsoft Excel from the chosen literature. Extracting pre-defined information from chosen articles and structuring it for additional analysis and synthesis is known as data extraction (Aromataris& Pearson, 2014).

3. Results

The findings obtained when implementation of the methodology outlined previously were carried out are contained in this here. This encompasses the study components and characteristics of interest in the selected literature, such as comparison of learning anatomy with cadaveric dissection and plastic models by medical students.

3.1. Database Query and Literature Selection

The databases assessed for literature search include: Cochrane, Research gate, Medline, Web of science, Pyscheinfo, Pubmed Central and Goggle scholar. The search strategy outlined in Chapter 3 was used in the database query process, which yielded: 1 from Medline; 11, 341 articles from PubMed central , 7 from Cochrane, 40 articles from research gate, 23 from web of science, 848 from goggle scholar and 5 articles from pyscheInfo. A total of 14 articles, which meet the inclusion criteria for this review, were finally selected and included in this review. A graphical illustration of the screening and selection procedure is shown in the PRISMA flow diagram (Figure 4.1).

The flow chart shows the selection process, as well as the retrieved number of articles, articles excluded at each stage and the number finally selected.

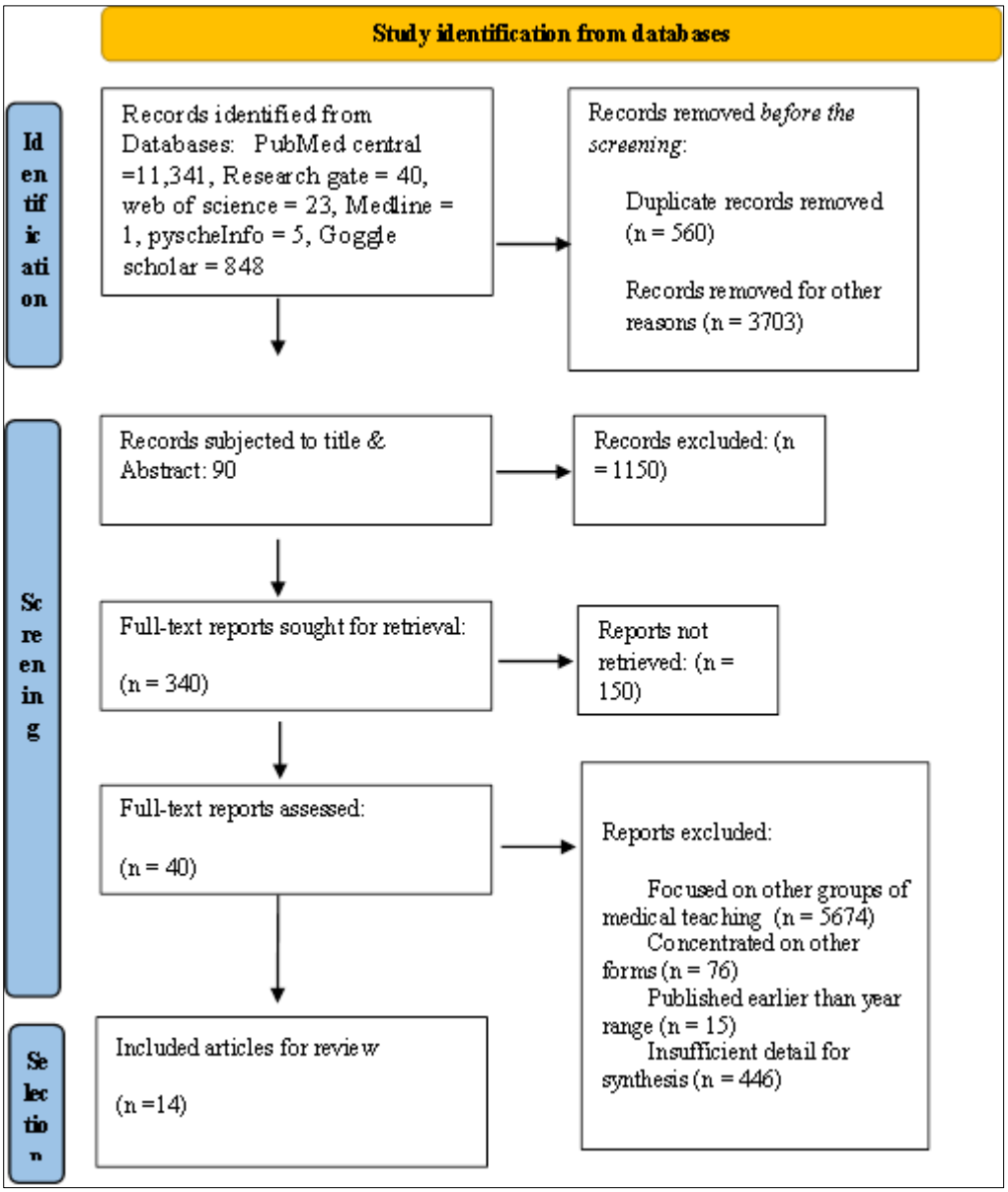

Figure 1 Prisma Flow Diagram

Table 3 Summary of Details from Selected Articles

S/N	Author(s)	Title	Aim	Study Design	Country	Key Findings
1	Rafael Boscolo-Berto,Cinzia TortorellaAndrea Porzionato,Carla Stecco, Edgardo Enrico Edoardo Picardi3· Veronica Macchi, Rafaele De Caro1, (2020).	The additional role of virtual to traditional dissection in teaching anatomy: a randomised controlled trial	the present study hypothesized that integrating the classical gross dissection with a supplemental virtual experience on digital human cadaver can improve the learning of anatomy with benefits on students' performance.	Quantitative	Italy	The combination of virtual to traditional gross dissection resulted in a significant improvement of second-year medical students' learning outcomes. It could be of help in maximizing the impact of practical dissection, overcoming the contraction of economic resources, and the shortage of available bodies
2	Saima Naz, Ghazala Nazir, Samia Iram*, Malik Mohammad, Umair, Iftikhar Hussain Qari, Shaheen Mohammad, 2011	Perceptions of cadaveric dissection in anatomy teaching	To find out the reasons for which dissections are being avoided by majority of the medical students.	Quantitative	Pakistan	In spite of availability of required number of cadavers in all 5 medical colleges and a clear realisation amongst the students that dissecting cadaver is an effective way of learning anatomy; majority of students were not very keen and had therefore not performed dissection even once
3	T. Sadeesh G. Prabavathy Arthi Ganapathy 2021	Evaluation of undergraduate medical students' preference to human anatomy practical assessment methodology: a comparison between online and traditional methods	aimed at quantifying the students' experience on virtual assessment	Quantitative	India	The inclination of students' preference for traditional anatomy examination methods mandates adequate training of both students and teachers for virtual examination. The superiority of conventional anatomy practical examination methods is unbiased but pandemic situations warrant adequate preparedness. In the future the anatomy teaching and evaluation methodology in Indian medical schools have to be drastically reviewed in equivalence with global digitalization.
4	Mange Manyama, Renae Stafford , Erick Mazyala , Anthony Lukanima , Ndulu Magele1 , Benson R. Kidenya ,	Improving gross anatomy learning using	To evaluate students and faculty opinions on the traditional teaching and reciprocal peer teaching (RPT) methods during	Quantitative	Tanzania	Introduction of RPT in our anatomy dissection laboratory was generally beneficial to both students and faculty. Both objective (student performance)

	Emmanuel Kimwaga , Sifael Msuya and Julius Kauki4 (2016)	reciprocal peer teaching	anatomy dissection. In addition, comparison of student's performance on objective examinations prior and after introduction of RPT was done			and subjective data indicate that RPT improved student's performance and had a positive learning experience impact. Our future plan is to continue RPT practice and continually evaluate the RPT protocol
5	Eléonore Brumpt, Eugénie Bertin1, Laurent Tatu ,and Aurélien Louvrier 2023	3D printing as a pedagogical tool for teaching normal human anatomy	To describe and analyse the methods utilised for creating 3DPAMs used in teaching human anatomy and for evaluating its pedagogical contribution.	a systematic review	France	This systematic review demonstrates that 3DPAMs are feasible at a low cost and effective for teaching anatomy. More realistic models require access to more expensive 3D printing technologies and substantially longer design time, which would greatly increase the overall cost..
6	Lakal O. Dissabandara, Selvanayagam N. Nirthanan, Tien K. Khoo , Raymond Tedman 2015	Role of cadaveric dissections in modern medical curricula: a study on student perceptions	To evaluate students' perception of dissection in a graduate-entry, problem-based learning–based medical curriculum.	Qualitative analysis	Australia	Student perceptions appear to favor a role for cadaveric dissection in learning anatomy in modern medical curricula.
7	Khadija Qamar, Amina Ahmad, Abid Ashar, 2014	Comparison of learning anatomy with cadaveric dissection and plastic models by medical students	The purpose of this study at Army Medical College was to assess differences in learning of students from cadaveric dissection or plastic models; and explore their perceptions about efficacy of various instructional tools used during the gross anatomy practical time	Two phase mixed methods sequential study	Pakistan	Students exposed to models performed better in gross anatomy examination than those who learned through cadaveric dissection.
8	Edmund Atta Asante , Raymond S. Maalman1 , Mahamudu Ayamba Ali1, Yaw Otchere Donkor , Joseph K. Korpisah 2021	Perception and Attitude of Medical Students towards Cadaveric Dissection in Anatomical Science Education.	to evaluate UHAS medical students' perception and attitude toward dissection in the teaching and learning of human anatomy	Qualitative	Ghana	This study demonstrated a participatory approach to needs assessment by identifying the gaps between "perceived importance" and "self-rated performance", as criteria for determining priorities. Findings also demonstrated the need for adopting a comprehensive approach to faculty development in which both departmental and organizational

						initiatives are required. Our findings are applicable to the Gulf Region context and our methodology can be applied anywhere.
9	Kerry Ann Dickson, Bruce Warren Stephens, 2015	It's All in the Mime: Actions Speak Louder Than Words When Teaching the Cranial Nerves	The aim of this pilot study was to compare the effectiveness of didactic lecturing with that of miming lecturing for student learning of the CNs.	Quantitative	Australia	This study's findings support the theory that gestures and body movements help learners to acquire anatomical knowledge.
10	Nicholas Tripodi, Kate Kelly, Maja Husaric, Rebecca Wospil, Michael Fleischmann, Susan Johnston, Katherine Harkin (2020)	The Impact of Three-Dimensional Printed Anatomical Models on First-Year Student Engagement in a Block Mode Delivery	To evaluate the students' engagement with and perceptions of the models.	A two-part mixed-method sequential exploratory design	Australia	This study indicated that the majority of students found the models to be an engaging resource that helped improve their study habits. As a result, students strongly felt that the use of the models inspired greater academic confidence and overall better performance in their assessments.
11	Junhua Xiao, Sharmeen Adnan 2022	Flipped anatomy classroom integrating multimodal digital resources shows positive influence upon students' experience and learning performance	to evaluate students' perception of the flipped classroom model and digital resources	Quantitative	Australia	This study extends the pedagogy innovation of flipped classroom teaching, which will advance future anatomy curriculum development, pertinent to post-pandemic education
12	Dearbhla P. Cullinane | Denis S. Barry, 2022	Dyad pedagogy in practical anatomy: A description of the implementation and student perceptions of an adaptive approach to cadaveric teaching		A systematic review and meta-analysis	Ireland	Strong preferences for quality time with the donor body supported by online resources suggests this modality should be a key consideration in course design for anatomy curricula and emphasizes the importance of gauging students' preferences to optimize satisfaction and learning output when pivoting to blended learning strategies in anatomy education.

13	Audrey M. K. Dempsey, Eithne Hunt Mutahira Lone, Yvonne M. Nolan 2022	Awareness of Universal Design for Learning among anatomy educators in higher level institutions in the Republic of Ireland and United Kingdom	to determine if anatomy educators in the Republic of Ireland (ROI) and United Kingdom (UK) are aware of UDL and to assess if, and to what extent, it has been implemented in the design and delivery of anatomy curricula for healthcare students	Quantitative	Ireland	There is a lack of information on the benefits of explicit utilization of UDL for engagement and motivation to learn anatomy in healthcare programs in the ROI and UK.
14	Richard B. Gunderman, MD, PhD, and Philip K. Wilson, PhD 2005	Exploring the Human Interior: The Roles of Cadaver Dissection and Radiologic Imaging in Teaching Anatomy		Article	United states	This study is a combination of the two approaches that were discussed, one being a centuries-old hands-on approach and the other being based on state-of-the-art radiological imaging whose existence was not even foreseen just a few decades ago

4. Discussion

Investigate the feasibility and practicality of employing cadaveric dissection versus anatomical models in resource-constrained settings, particularly in low- and middle-income countries

[19] Richard B. Gunderman et al The intellectual agenda of gross anatomy has demonstrated a diminishing appeal to recent generations of biomedical scientists and educators. For one thing, some medical schools have downsized or even closed their anatomy departments. In both absolute and relative terms, there are fewer anatomists on medical school faculties today than several decades ago. This reflects, in part, the ascendancy of new fields of biomedical science, such as molecular biology, whose funding through the National Institutes of Health has increased exponentially, at the expense of investigations centered on gross anatomy. This is not to say that gross anatomy as such is dead, only that attracting people into the field has become more challenging, with important implications for the number of anatomists available on medical school faculties to teach anatomy courses. Costs associated with obtaining cadavers for anatomical education can be significant. Furthermore, scandals surrounding the misuse of cadavers for personal gain in the U.S. may increase regulations and administrative costs even further. By contrast, radiological depictions of anatomy are less expensive and likely to be already available because they were originally created for clinical, educational, or research purposes. This highlights the lower costs and fewer ethical concerns of using radiological data as a substitute for human cadavers

[71] Audrey M. K. Dempsey et al stated that, in the modern curriculum, there are constraints on the amount of time allocated to the formal teaching of anatomy within healthcare programs, and more specifically time dedicated to dissection.

Examine students perception and satisfaction with learning experience when taught anatomy using cadavers or anatomical models in diverse socioeconomic context

[20] Lakal O et al., (2015) concluded that a majority of the participants perceived this experience of human cadaveric dissections as a means of enhancing respect towards the human body. This observation supports Weeks et al.'s consideration that benefits of a dissection program may include the opportunity to develop a relationship between student and cadaver donor which has been coined to be a model of clinician-patient relationship at the very early stages of a developing medical student. We suggest that it is imperative that medical students are exposed to opportunities that nurture professional attributes essential for medical practice such as respect, dignity and compassion; thus, dissection provides our students with an invaluable opportunity for them to learn to be appreciative of the act of donation behave respectfully and develop a sense of compassion and empathy towards suffering.

[18] Edmund A.A. et al concluded that the students considered dissection as inevitable. Most of the respondents claimed they would be disadvantaged if they did not attend dissection (77.6%) with 60.8% asking for more time for dissection. Also, a significant number (74.5%) disagreed to the replacement of dissection with other methods of learning and teaching anatomy. This finding validates other studies which recognized dissection as very acceptable means of teaching and learning anatomy with only a few students calling for its replacement.

[36] Nicholas Tripodi et al stated that more specifically, in anatomy education, deep learning can be achieved through learning strategies such as visualization, self-directed learning, discussion with others, and clinical application. [75] Literature also suggests that that the quality and detail of the 3DP model can aid in achieving higher degrees of successful learning outcomes (Kong et al., 2016). [76] More recently, it has been shown that personal 3DP anatomical models can be used effectively to augment both the curriculum and more traditional laboratory-based learning approaches (Mogali et al., 2018; Smith et al., 2018; Backhouse et al., 2019). [77] Despite the widespread adoption of 3DP anatomical models into medical and surgical education and training (Baskaran et al., 2016; Fasel et al., 2016; Lim, et al., 2016), [78] there is little research that explores the effectiveness of their use in other health education disciplines (Azer and Azer, 2016).

[19] Richard B. Gunderman et al stated that one major benefit of dissection is that students learn anatomy in a hands-on fashion. They are not merely studying anatomical illustrations from textbooks or performing virtual dissections using the latest anatomical simulation software. Instead, they get to know the interior of the human body not only visually but tactilely, and, indeed, through the use of multiple senses. One additional advantage of dissection is the fact that students begin to develop their manual dexterity and skill in the use of instruments such as the scalpel and forceps, upon which many will rely throughout their careers.

Explore the perceptive of anatomy faculty regarding the challenges and training requirements associated with implanting cadaveric dissection or anatomical models in medical education

[18] Edmund Atta Asante et al.,(2021) stated, However, some medical students do not consider dissection as the best method of teaching and learning anatomy citing factors such as smell, nausea, and irritation, as well as psychological, such as stress, depression, and emotional trauma . Such students have suggested other ways of learning to replace dissection**.** Despite these challenges, anatomy educators still resort this method of teaching with a blend to modern teaching and learning techniques such as interactive lectures, USG, MRI, CT scans, laparoscopy, and virtual cadavers . However, these methods have their challenges such as cost and the skills needed for their utilization especially in developing countries including Ghana. that With regards to emotional effects of dissection on the students, Often, it is the first-time students come into contact with a dead human body, and it can be a harrowing experience, and many times students react to the discomfort by being emotionally anxious. The anxiety of students can be influenced by factors such as sex, religion, cultural believes and practices regarding the dead body.

Compare the outcomes and experiences of teaching anatomy with cadavers or models in medical schools across low- and middle-income countries in Africa, Asia and the Middle East versus high-income countries in Europe

[79] Eléonore Brumpt et al stated the main advantages and experiences reported by the authors using 3DPAM as a pedagogical tool for teaching normal human anatomy were the visual and haptic characteristics, including authenticity , precision , variability of consistencies, colours and transparency, solidness , effectiveness for education reproducibility, possibility of improvement or personalization possibility of manipulation by the students time savings for teaching, ease of storage possibility of integrating functional anatomy or creating a specific design rapid design for bone models , possibility of co-creation and taking the model home, improvement in mental rotation ability and knowledge retention, and positive effect on educators.

With regard to student satisfaction, the main drawbacks reported by the researchers included stiffness, inconsistent quality, lack of detail, too much color, and fragility, loss of information, long image segmentation time, time-consuming printing, and high cost.

[43] Mange Manyama et al stated that the increase in the number of students' intake in medical schools across the world has added upon the challenges in teaching Human Anatomy as a medical and clinical science. In most medical schools in Africa, including at the Catholic University of Health and Allied Sciences (CUHAS), anatomical skills and knowledge are still being gained primarily through didactic lectures and complete dissection of the human body. The use of cadavers in human Anatomy teaching requires an adequate number of Anatomy instructors who can provide close supervision of the students. However, most schools across the world are facing shortage of qualified anatomists. Despite being replaced by two- or three-dimensional virtual representations and computer-assisted learning programs, cadaver dissection has remained core to Anatomy teaching in most parts of the world.

The other drawback of cadaver dissection method is teacher centered is that it places students in a passive rather than an active role, which hinders learning. A student-centered learning method enables students to direct their own learning, promotes student collaboration and communication through group work and identifies a "hidden curriculum".

[80] Khadija Qamar et al stated that several universities in the west have abandoned dissection and have moved from a cadaver-oriented to a cadaver less study of human anatomy. Time constraints is just one factor impacting on an institution's decision to use a specific teaching modality; others include cost, staff requirements, educational impact, unavailability of sufficient cadavers and decreased number of demonstrators and students' acceptability.

5. Conclusion

[80] Khadija Qamar et al stated that anatomy plays a crucial role in the medicine, and anatomy education is the ground base of medicine education. Anatomy, being a major basic subject in medicine and related biomedical sciences, is taught traditionally by methods including didactic lectures and demonstrations. Gross anatomy practical's time is an important period of learning. A central tool used for teaching anatomy is dissecting cadavers, in which the medical students learn the basic anatomical principles of the human body.

The comparative effectiveness of cadaveric dissection and anatomical models in teaching anatomy is a complex and multifaceted issue, with considerations extending beyond educational outcomes to encompass economic, logistical, and ethical dimensions. While both methods have their merits, medical schools in LMICs face distinct challenges that require innovative solutions. A balanced approach that leverages technological advancements and addresses local constraints

can pave the way for enhanced anatomy education worldwide, ensuring that medical students are equipped with the knowledge and skills necessary for effective clinical practice.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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