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Student-Centered Anatomy Learning Survey: Insights from the First-Year Medical Students

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ABSTRACT

Introduction: Human anatomy is a foundational discipline in medical education, focusing on the structural and functional relationships within the human body. Rooted in ancient Greek origins, the term "anatomy" signifies the dissection and study of body structures. As medical education evolves, bridging theoretical knowledge with clinical application becomes essential. Various teaching methods aim to enhance students' practical skills and engagement in anatomy addressing the challenge of memorization and application. Traditional teaching methods, including dissection, prosecution, tutorials, and lectures, have long been supplemented by modern approaches such as anatomical models and e-learning. Despite these advancements, the preferences of medical students and anatomy faculty towards teaching methods remain unclear. Emerging trends like e-learning and technological innovations present new opportunities and challenges, especially amid the COVID-19 pandemic, necessitating a comprehensive understanding of effective teaching strategies.

Methodology: The study was designed as a cross-sectional survey to evaluate the teaching practices of The Human Anatomy Department. The survey was conducted using a structured questionnaire, targeting medical students who had completed their first-year clinical courses. The study took place at The University of Science and Technology, Faculty of Medicine in Khartoum State. The study population included medical students of both genders who had completed their first-year clinical courses. Inclusion criteria were students who had finished their first-year clinical courses and agreed to complete the questionnaire. Students who had not completed their first-year clinical courses were excluded from the study. The study aimed for total coverage of all first-year medical students in The University of Science and Technology with 248 participants were involved. Data was collected using a structured questionnaire distributed via Google Forms. The questionnaire adapted from a 2019 study by S. Swetha et al. at Saveetha Medical College, Chennai, Tamil Nadu, comprised 18 items. These items focused on various aspects of the current teaching methodology and assessment techniques, including preferences for teaching aids, methodologies for theoretical and practical classes and evaluation patterns for histology and embryology classes. Students selected their preferred options independently and anonymously, ensuring unbiased responses. Before distribution, approval was obtained from The Department of Anatomy, and students

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were informed about the study's purpose and assured of confidentiality. The questionnaire was designed to be completed within a reasonable timeframe, allowing students to provide thoughtful and candid feedback. Data entry, cleaning, and analysis were performed using SPSS (Statistical Package for the Social Science) version 20 (2015).

Results: A total of 248 first-year medical students from the University of Science and Technology, Faculty of Medicine participated in the study. Of these 63.3% (157) were female, 35.9% (89) were male and 0.8% preferred not to disclose their gender. The age of participants ranged between 18 and 30 years. In terms of the duration of the anatomy curriculum 25% of the students think that it should be more than a year and half, 24.2% believed it should be a year whereas 35.1% had no idea about the appropriate duration. The current duration is 1 year and half.

In regards to students' opinion about the best teaching methods for theory classes; our study shows that 45% of students believed the best teaching methods for theory classes are lectures followed by 27 % for small groups and interactive media. Moreover, when it comes to the students' opinions about their preferred way of teaching method for practical sessions 48% of students Preferred Anatomical models, 29 % for dissection, 16.9% preferred educational videos followed by 4.8 preferred prosection.

The students' opinion towards the best source of study material (36.3%) of students Preferred study by using textbook (36.3%) (51% of them used Snell clinical anatomy followed by 34% preferred Gray's anatomy), (35.9%) preferred the Internet as it deepened their understanding of anatomical structures and helped them to recall what they learnt, (19.4%) favored teachers notes and (8.5%) found solved questions papers more helpful. In regards to students' opinions about why integrating multimedia in learning anatomy is helpful, 58% of students said that learning anatomy using Multimedia relies on the scientific content is not boring and it Does not cause lack of attention. The student's opinion towards Specific problems in understanding embryology, (52.4.5%) of students believed the problems are related to inability to comprehend the sequence of events, inability to visualize and inadequate time and in regards to histology most of students believed the problems are related to difficult to identify structures on the slide and insufficient time in lectures and practical. When asked about their opinion for the best possible solution for problems in learning histology and embryology, (34%) students suggest Simplify the information/ give less details/make differences clear, 29.0% for Using more visual aids including 3D models and 28.6% For More time/more lectures. Most of the students preferred the pattern that included descriptive questions, multiple-choice questions and short notes questions. And for best assessment technique to measure the knowledge in theory most students who preferred weekly tests were 55% and to measure the skills in practical sessions about 46.4 % of students preferred assessment technique Via on models and 44.4% favored assessment via dissected body.

The students' opinion towards the best possible solution for problems in theory (29.8%) of students suggested clearer explanation in lectures/tutorial and (26.2%) suggested additional time required for dissection and tutorial and towards best possible solution for problems in practical, (31%) students suggested additional time required for dissection and tutorial clearer explanation in lectures/tutorial. The study revealed varied opinions on the duration and teaching methods of the anatomy curriculum. About 35.1% of students had no idea about the duration of the curriculum while 25% felt it should be extended beyond 1.5 years. Regarding the best teaching methods for theory classes 45% preferred lectures, while 27% favored small groups and interactive media. For practical sessions 48.4% of students preferred anatomical models followed by 29.8% who favored dissection. When asked about the best source of study material 36.3% chose textbooks and 35.9% preferred the internet. The most frequently used textbook was Snell clinical (51.6%), followed by Gray's anatomy (33.9%). Additionally, 58.1% of students preferred multimedia teaching methods, citing that it relies on scientific content, is not boring and does not cause a lack of attention. However, 64.5% believed the problems with multimedia teaching were related to the lecturer's ability to convey the material and the difficulty in imagining relationships. The study identified several specific problems in understanding anatomy, histology, and embryology. For embryology, 52.4% of students reported issues with comprehending the sequence of events, visualizing concepts and inadequate time. Similarly, for histology, students found it difficult to identify structures on slides and noted insufficient time in lectures and practical sessions. To address these issues, 29.8% of students suggested clearer explanations in lectures and tutorials while 26.2% recommended additional time for dissection and tutorials. For practical anatomy classes, 31% of students believed that providing additional time for dissection and clearer explanations would be beneficial. In terms of histology and embryology, 34.3% of students recommended simplifying information and providing less detail to make differences clearer, 29% suggested using more visual aids including 3D models and 28.6% called for more lectures. These findings highlight the need for improved teaching methods, additional resources, and better time management to enhance student understanding and engagement in these subjects.

Conclusion: The study revealed that first-year medical students favored lectures for theoretical classes and anatomical models for practical sessions. While multimedia teaching methods were well-received, traditional cadaveric dissection remained important despite some negative perceptions. We recommend Educational institutions should implement a mixed examination format and incorporate continuous assessments. A balanced approach using both anatomical models and cadaveric dissection, supplemented with multimedia resources, is recommended to cater to diverse learning styles. Future studies should consider longitudinal designs to track changes in student perceptions over time and use objective measures to evaluate the effectiveness of different teaching methods. Additionally, exploring the impact of emerging technologies on anatomy education warrants further investigation.

Background

Human anatomy is a foundational discipline in medical education, focusing on the structural and functional relationships within the human body. Rooted in ancient Greek origins, the term "anatomy" signifies the dissection and study of body structures. As medical education evolves, bridging theoretical knowledge with clinical application becomes essential. Various teaching methods aim to enhance students' practical skills and engagement in anatomy addressing the challenge of memorization and application. Traditional teaching methods, including dissection, prosecution, tutorials, and lectures, have long been supplemented by modern approaches such as anatomical models and e-learning. Despite these advancements, the preferences of medical students and anatomy faculty towards teaching methods remain unclear. Emerging trends like e-learning and technological innovations present new opportunities and challenges, especially amid the COVID-19 pandemic, necessitating a comprehensive understanding of effective teaching strategies.

The importance of human anatomy in clinical practice is profound as it underpins the safe and effective patient care across all medical specialties by providing an essential understanding of bodily structures [1]. The study of anatomy dates back to ancient civilizations with pivotal contributions from historical figures like Galen and Vesalius [2]. Over time, anatomical teaching methods have evolved from traditional dissection to modern technologies such as plastination and radiological imaging. In the 20th century, educational reforms transformed medical curricula, shifting towards learner-centered approaches and integrating basic and clinical sciences with problem-based learning (PBL), becoming a prominent method that encourages active student engagement and interdisciplinary learning [3]. Traditional anatomy curricula faced criticism for their heavy emphasis on rote memorization and insufficient integration with clinical practice leading to reforms that aimed to reduce cognitive load and incorporate a broader range of disciplines. Significant reforms in the mid-20th century, influenced by the Flexner and Todd Reports who sought to modernize medical education by integrating the basic and clinical sciences and expanding the curriculum's scope [4].Today's anatomy education employs a variety of teaching methods including: cadaveric dissection, simulations and radiological modalities to enhance learning outcomes and better prepare students for clinical practice.

Rational and Justification

In the new environment of a medical college, the first-year students encounter challenges in adapting to the teaching/learning process, particularly in pre-clinical subjects like anatomy. Issues such as difficulty in understanding, adjusting to college life and navigating the dissection hall atmosphere contribute to unpleasant learning experiences, leading to frustration, lack of interest and diminished self-confidence among students.

Justification

- A responsive medical curriculum must address the needs of students, institutions, and communities.
- Student feedback is vital for identifying strengths and weaknesses in teaching methods, informing curriculum revisions and improvements.
- Understanding students' perspectives is essential for optimizing teaching methods and facilitating the learning process, particularly in anatomy education.
- Anatomists familiar with medical education can play a crucial role in enhancing students' knowledge, attitudes and skills.

Participants from a small midwestern university were invited to participate in the research study in exchange for a gift card. Following the description of the study, each participant completed an informed consent form as a part of this IRB approved study. One male and two females between 18-26 years old participated in the study.

Objectives

General Objective

The study is aimed to examine the First-Year Medical Students' Perception of different teaching methods during the Study of human anatomy at The University of Science and Technology in the year of 2021.

Specific Objective

1. Assess students' perception of the various teaching methods and their complementary roles.
2. Identify the most effective method for students to acquire and retain information during the study of anatomy.
3. Explore students' preferences regarding the different source materials in terms of flexibility, availability and time-saving.
4. Investigate students' opinion on the major challenges they face while studying anatomy.
5. Continuous assessment of the different teaching methods effect on students' cognitive learning outcome.

Methodology

Study Design

The study was designed as a cross-sectional survey to evaluate the teaching practices of The Human Anatomy Department. The survey was conducted using a structured questionnaire, targeting medical students who had completed their first-year clinical courses. This design was chosen to capture a snapshot of students' perceptions and experiences with the current teaching methodologies.

Setting

The study took place at The University of Science and Technology, Faculty of Medicine in Khartoum State. The faculty consists of 15 teachers and 6 workers with qualifications ranging from professors to teaching assistants. The anatomy department has 25 cadavers, various bones, skeletons, models, pictures and prosected specimens. Additionally, the faculty houses two histology labs and a museum. The diverse resources and experienced staff provided a comprehensive setting for the study, enabling a thorough evaluation of anatomy teaching practices.

Population

The study population included medical students of both genders who had completed their first-year clinical courses. These students had been exposed to one year of anatomy classes, making them well-suited to assess the teaching practices of the institution. Inclusion criteria were students who had finished their first-year clinical courses and agreed to complete the questionnaire. Students who had not completed their first-year clinical courses were excluded from the study.

Technique

The study aimed for total coverage of all first-year medical students in The University of Science and Technology with 248 participants were involved. This approach ensured that every eligible student had the opportunity to participate, providing a comprehensive overview of the student body's perceptions and experiences with the anatomy curriculum and teaching methods.

Data Collection

Data was collected using a structured questionnaire distributed via Google Forms. The questionnaire adapted from a 2019 study by S. Swetha et al. at Saveetha Medical College, Chennai, Tamil Nadu, comprised 18 items. These items focused on various aspects of the current teaching methodology and assessment techniques, including preferences for teaching aids, methodologies for theoretical and practical classes and evaluation patterns for histology and embryology classes. Students selected their preferred options independently and anonymously, ensuring unbiased responses. Before distribution, approval was obtained from The Department of Anatomy, and students were informed about the study's purpose and assured of confidentiality. The questionnaire was designed to be completed within a reasonable timeframe, allowing students to provide thoughtful and candid feedback.

Data Analysis

Data entry, cleaning, and analysis were performed using SPSS (Statistical Package for the Social Science) version 20 (2015). Descriptive statistics summarized the demographic characteristics and responses to each questionnaire item. Inferential statistics, including chi-square tests and t-tests were used to identify significant differences in perceptions based on demographic factors such as gender and previous academic performance. The analysis aimed to highlight key trends and areas for improvement in the teaching methods

Ethical Considerations

Ethical clearance was obtained from The Medical Education Development & Research Centre of Gezira University. Permission for data collection was granted by the University of Science and Technology, Faculty of Medicine. Informed consent was obtained from all participants before data collection, ensuring they were aware of the study's purpose and their right to withdraw at any time. Participants were assured that their responses would remain confidential and used solely for research and evaluation purposes. The study adhered to ethical guidelines to ensure the integrity and ethical standards of the research process.

Results

Demographic Data

A total of 248 first-year medical students from the University of Science and Technology, Faculty of Medicine participated in the study. Of these 63.3% (157) were female, 35.9% (89) were male and 0.8% (2) preferred not to disclose their gender. The age of participants ranged between 18 and 30 years. This demographic distribution provides a comprehensive overview of the student body's perception, ensuring that the results reflect a diverse range of experiences and perceptions.

Duration of The Curriculum of Anatomy

In terms of the duration of the anatomy curriculum our study shows that 25% of the students think that it should be more than a year and half, 24.2% believed it should be a year whereas 35.1% had no idea about the appropriate duration. The current duration is 1 year and half.

Best Teaching Method

In regards to students' opinion about the best teaching methods for theory classes; our study shows that 45% of students believed the best teaching methods for theory classes are lectures followed by 27 % for small groups and interactive media. Moreover, when it comes to the students' opinions about their preferred way of teaching method for practical sessions 48% of students Preferred Anatomical models, 29 % for dissection, 16.9% preferred educational videos followed by 4.8 preferred prosection.

Study Resources and Multimedia

The students' opinion towards the best source of study material (36.3%) of students Preferred study by using textbook (36.3%) (51% of them used Snell clinical anatomy followed by 34% preferred Gray's anatomy), (35.9%) preferred the Internet as it deepened their understanding of anatomical structures and helped them to recall what they learnt, (19.4%) favored teachers notes and (8.5%) found solved questions papers more helpful. In regards to students' opinions about why integrating multimedia in learning anatomy is helpful, 58% of students said that learning anatomy using Multimedia relies on the scientific content is not boring and it Does not cause lack of attention.

Obstacles learning Embryology and Histology

The student's opinion towards Specific problems in understanding embryology, (52.4.5%) of students believed the problems are related to inability to comprehend the sequence of events, inability to visualize and inadequate time and in regards to histology most of students believed the problems are related to difficult to identify structures on the slide and insufficient time in lectures and practical. When asked about their opinion for the best possible solution for problems in learning histology and embryology, (34%) students suggest Simplify the information/give less details/make differences clear, 29.0% for Using more visual aids including 3D models and 28.6% For More time/more lectures. Most of the students preferred the pattern that included descriptive questions, multiple-choice questions and short notes questions.

Students preferences in assessment techniques

And for best assessment technique to measure the knowledge in theory most students who preferred weekly tests were 55% as shown in and to measure the skills in practical sessions about 46.4 % of students preferred assessment technique Via on models and 44.4% favored assessment via dissected body.

Student's Suggestions

The students' opinion towards the best possible solution for problems in theory (29.8%) of students suggested clearer explanation in lectures/tutorial and (26.2%) suggested additional time required for dissection and tutorial and towards best possible solution for problems in practical, (31%) students suggested additional time required for dissection and tutorial clearer explanation in lectures/tutorial.

Perceptions of Teaching Methods

The study revealed varied opinions on the duration and teaching methods of the anatomy curriculum. About 35.1% of students had no idea about the duration of the curriculum while 25% felt it should be extended beyond 1.5 years. Regarding the best teaching methods for theory classes 45% preferred lectures, while 27% favored small groups and interactive media. For practical sessions 48.4% of students preferred anatomical models followed by 29.8% who favored dissection. When asked about the best source of study material 36.3% chose textbooks and 35.9% preferred the internet. The most frequently used textbook was Snell clinical (51.6%), followed by Gray's anatomy (33.9%). Additionally, 58.1% of students preferred multimedia teaching methods, citing that it relies on scientific content, is not boring and does not cause a lack of attention. However, 64.5% believed the problems with multimedia teaching were related to the lecturer's ability to convey the material and the difficulty in imagining relationships.

Specific Problems and Solutions

The study identified several specific problems in understanding anatomy, histology, and embryology. For embryology, 52.4% of students reported issues with comprehending the sequence of events, visualizing concepts and inadequate time. Similarly, for histology, students found it difficult to identify structures on slides and noted insufficient time in lectures and practical sessions. To address these issues, 29.8% of students suggested clearer explanations in lectures and tutorials while 26.2% recommended additional time for dissection and tutorials. For practical anatomy classes, 31% of students believed that providing additional time for dissection and clearer explanations would be beneficial. In terms of histology and embryology, 34.3% of students recommended simplifying information and providing less detail to make differences clearer, 29% suggested using more visual aids including 3D models and 28.6% called for more lectures. These findings highlight the need for improved teaching methods, additional resources, and better time management to enhance student understanding and engagement in these subjects.

Discussion

This study explored the perceptions of first-year medical students towards different teaching methods in the study of human anatomy at the University of Science and Technology in Sudan in 2021. A total of 248 students participated, comprising 35% male and 63% female students.

The study revealed that 35% of students were unaware of the curriculum duration, while 25% suggested that it should last more than 1½ year. For theory classes, 45% preferred lectures, followed by 27% favoring small groups and interactive media. This finding is consistent with Al-Hayani who noted that traditional teaching methods for theoretical anatomy classes were more comprehensible, contrasting with Malukar et al. who found a preference for small groups teaching with interactive media [5]. Regarding practical methods, 48.4% of participants preferred teaching through anatomical models, while 29.8% preferred dissection. Dissabandara et al. also reported a preference for dissection among students, with many expressing satisfactions with time spent in the dissection room and opposing the elimination of dissection programs [6]. Ghazanfar et al. highlighted cadaveric dissection as the most effective method for teaching anatomy among doctors, particularly in surgical fields, which contradicts with our findings [7].

Regarding the understanding of trauma effects, only 40% of participants agreed that cadaveric dissection provides better insights. Many students cited negative perceptions, including time consumption related to the small numbers of cadavers to students (59.3%), difficulty in structure identification (48.4%), and dislike for preservative smells (45.1%). (Psychological stress in dealing with cadavers) Despite these concerns, 84.9% of students opposed eliminating the dissection program with 68.7% satisfied with the time spent on dissection, aligning with studies emphasizing the realistic understanding provided by traditional cadaveric dissection. More than half (58.1%) of the participants agreed that multimedia teaching does not cause attention deficits or boredom, which correlates with Rai et al. who found social media and multimedia effective in anatomy education. Additionally, 48% preferred a combination of dissection hall and multimedia teaching, indicating a need for diverse teaching methodologies. Moreover, nearly a third of student's participants (29%) responded positively to more visual aids including 3D models. Similar findings were reported by Ewha Woman's University in 2018, emphasizing the utility of 3-dimensional atlases in anatomy education, with almost all participants (90%) finding them helpful for understanding human body structures.

Participants also highlighted difficulties in studying specific disciplines like embryology, with more than half struggling with visualization, understanding event sequences and inadequate timing. Proposed solutions included the need for more visual aids (21%), clearer explanations (29.8%), and additional time for dissection and tutorials (26.2%), which all correlate with what Guimarães Moraes showed when the used systems-integrated learning in the State University of Campinas (UNICAMP) for a new curriculum they went even further with proving that because most students are struggling with the visualization, embryology teaching should be based on clinical cases, and the

multiple hypermedia resources and materials (textbooks and software) that are marketed to teach human embryology do not fully match that goal and the results were very satisfying for most students. Regarding information sources, textbooks and internet use were equally preferred (36.3% and 35.9%, respectively), reflecting the convenience of internet access and availability of textbooks on modern devices such as smartphones and personal computers [8].

And for opinions towards specific problems in understanding histology most of students believed the problems are related to difficult to identify structures on the slide and insufficient time in lectures and practical which goes with Magdalena García who found that 77% of students stated that their difficulty in interpreting histology images was due to their lack of knowledge of anatomy; followed by their difficulty in delimiting cells (72%) and histological sections orientation (62%) [9].

In regards to assessment tools, most students preferred weekly tests about 55%, and to measure skills in practical sessions about 46.4 % of students preferred assessment technique Via on models, 44.4% favored assessment via dissected body which goes along with Sagoo who showed that students' performance was significantly higher on clinically oriented anatomy questions with images of the dissected body compared to questions without images.

Implications for Teaching

The preference for anatomical models over dissection indicates a shift towards less invasive and more visual learning tools. However, the continued importance of dissection as highlighted by other studies, suggests that a balanced approach incorporating both methods is necessary. This can provide students with a realistic understanding of human anatomy while accommodating different learning styles.

The positive reception of multimedia teaching methods suggests that integrating multimedia and traditional methods can enhance learning. For instance, combining dissection hall sessions with multimedia resources can provide a richer learning experience. This approach can also address the negative perceptions of cadaveric dissection by supplementing it with visual aids that make the learning process more engaging and less daunting. Additionally, addressing specific problems such as difficulties in understanding histology and embryology requires targeted solutions. Providing more visual aids, clearer explanations, and additional time for dissection and tutorials can help students overcome these challenges. This approach is supported by studies indicating that 3D models and multimedia resources can significantly enhance the learning experience.

Strengths and Limitations

One of the strengths of this study is its comprehensive analysis of student preferences and perceptions, providing valuable insights for improving anatomy education. The study's large sample size (248 students) enhances the generalizability of its findings. Additionally, the study's focus on a diverse range of teaching methods and assessment techniques offers a holistic view of student preferences. However, the study has some limitations. The reliance on self-reported data may introduce bias, as students might have provided socially desirable responses. Additionally, the study's cross-sectional design captures preferences at a single point in time, which may not reflect changes over time or in different educational contexts. Future research could address these limitations by incorporating longitudinal designs and objective measures of learning outcomes [10].

Conclusions

The study revealed that first-year medical students favored lectures for theoretical classes and anatomical models for practical sessions. While multimedia teaching methods were well-received, traditional cadaveric dissection remained important despite some negative perceptions.

Recommendations

Educational institutions should implement a mixed examination format and incorporate continuous assessments. A balanced approach using both anatomical models and cadaveric dissection, supplemented with multimedia resources, is recommended to cater to diverse learning styles.

Future Research

Future studies should consider longitudinal designs to track changes in student perceptions over time and use objective measures to evaluate the effectiveness of different teaching methods. Additionally, exploring the impact of emerging technologies on anatomy education warrants further investigation.

References

1. Louw G, Eizenberg N, Carmichael SW. The place of anatomy in medical education: AMEE Guide no 41. Med Teach. 2009; 31(5): 373-386.
2. Ajita R. Galen and his contribution to anatomy: a review. Jemds. 2015; 4(26): 4509-4517.
3. Weimer M. Learner-centered teaching: Five key changes to practice. John Wiley & Sons. 2013.
4. Duffy TP. The Flexner report--100 years later. Yale J Biol Med. 2011; 84(3): 269-276.
5. Al-Hayani A, Abd El-Aziz GS, Eldeek BS, Hammad S. Evaluation of using the interactive multimedia in teaching Anatomy. Banha Med J. 2008; 1: 12-15.
6. Nagar SK, Malukar O, Kubavat D, Prajapati V, Ganatra D, et al. STUDENTS'PERCEPTION ON ANATOMY TEACHING METHODOLOGIES. Njmr. 2012; 2(1): 111-112.
7. Dissabandara LO, Nirthanan SN, Khoo TK, Tedman R. Role of cadaveric dissections in modern medical curricula: a study on student perceptions. Anatomy & cell biology. 2015; 48(3): 205-212.
8. Ghazanfar H, Rashid S, Hussain A, Ghazanfar M, Ghazanfar A, et al. Cadaveric dissection a thing of the past? The insight of consultants, fellows, and residents. Cureus. 2018; 10(4).
9. Ghosh S, Chakraborty S. Learning anatomy from the internet. TCT. 2015; 12(6): 429-431.
10. García M, Victory N, Navarro-Sempere A, Segovia Y. Students' views on difficulties in learning histology. Anat Sci Educ. 2019; 12(5): 541-549.