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Satisfaction of medical students with the artistic anatomy lecture: A questionnaire study

Zekiye Karaca Bozdağ, Buse Naz Çandır Gürses

Department of Anatomy, Faculty of Medicine, Istanbul Yeni Yüzyıl University, İstanbul, Türkiye

ABSTRACT

Objectives: The aim of this study is to evaluate the effects of an artistic anatomy lecture on medical students and to identify the role of the lecture in education.

Methods: A 20-question online satisfaction survey was administered to 32 out of 45 medical students who attended the artistic anatomy lecture at our university in the fall semester of 2023-2024. In the survey, questions were asked to reveal the students' performance regarding the relationship between art and anatomy. SPSS Statistics 22 software (IBM SPSS, Turkey) was used for statistical analysis of the data obtained, and $P<0.05$ was considered statistically significant.

Results: Ninety-three point eight percent of students stated that the artistic anatomy lecture contributed to their understanding of the relationship between art and anatomy. Survey results indicated that 87.5% of participants reported the lecture improved their observational skills, while 81.3% said it enhanced their clinical observation skills. In addition, 90.6% of the participants stated that the lecture helped them to understand the importance of art in medical education.

Conclusions: The results show that the artistic anatomy lecture supports the development of important skills such as visual memory, analytical thinking and observational skills in medical students. In line with the literature, arts-based educational approaches enable students to gain an interdisciplinary perspective and develop the ability to pay attention to detail in clinical practice. We suggest that our findings may be useful for integrating artistic anatomy lectures into the curriculum of medical education, and may provide guidance to anatomists in this regard.

Keywords: Artistic anatomy, medical education, anatomy education, clinical observation, visual memory

Medical education is an interdisciplinary process that aims to enable students to learn in detail the structure, function and pathological conditions of the human body [1]. Anatomy is one of the cornerstones of this educational process and plays a critical role in the understanding and application of anatomical structures in clinical practice. Traditional anatomy teaching is usually based on cadaver dissection and plastic models. In recent years, however, more creative and multidisciplinary approaches have been incorporated into medical education. One such approach is artistic anatomy lectures [2, 3]. Seen as a meeting point between art and medicine, these lectures aim to deepen learning by approaching

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Corresponding author: Zekiye Karaca Bozdağ, PhD, Asst. Prof. Phone: +90 212 444 50 01, E-mail: zekiye.karaca@yeniyuzyil.edu.tr

anatomical knowledge from an artistic perspective [4]. Artistic anatomy is a discipline that has developed throughout history, with artists such as Leonardo da Vinci and Michelangelo having an in-depth knowledge of the body's structure. Particularly during the Renaissance, anatomy became one of the basic disciplines that nourished art, and knowledge of anatomy became very important in terms of drawing the correct human figure [5].

Art-based anatomy education strengthens students' visual memory and facilitates the learning process by providing an understanding of body structures from a different perspective. Integrating art and anatomy into medical education enables students to acquire not only theoretical knowledge, but also skills such as observation, attention to detail and analytical thinking [6]. Research has shown that arts-based approaches encourage creativity in medical students, improving their problem-solving and visual analysis skills, which are extremely useful when assessing patients in the clinic [7, 8].

Artistic anatomy lectures allow students not only to perceive the human body visually, but also to evaluate the anatomical structure of the body from an artistic point of view. This can be particularly useful for students with visual learning memories. Studies show that medical students learn more effectively using visual learning methods and are able to apply this knowledge more quickly in clinical practice [7, 9].

The aim of this study was to investigate the satisfaction of medical students with the Artistic Anatomy lecture, to evaluate the contribution of the lecture to the students, and to reveal how the connection of the lecture to clinical practice is perceived from the students' perspective. We believe that the results can highlight the impact of Artistic Anatomy on medical education and provide guidance for its integration into medical education.

METHODS

This study was carried out with 45 students of the Faculty of Medicine who took the lecture "Artistic Anatomy", which was opened as an elective lecture in the fall semester 2023-2024 of our university. At the end of the semester, the satisfaction survey prepared with the Google survey application was applied online. The survey form consisted of a total of 20 questions. There were 19 questions on a 5-point Likert scale and 1 open question.

Ethics committee approval for the study was obtained from our university's Science and Health Sciences Research Ethics Committee (IRB: 2024/12-1399).

Statistical Analysis

The conformity of the variables to normal distribution was checked with the Shapiro Wilk Test. The categorical variables were compared between the groups by using the Pearson Chi-Square, Fisher's Exact Chi-Square, Fisher Freeman Halton Test, and McNemar Test. According to the normality test results, the Mann-Whitney U Test was used for the comparisons between binary groups, and the Wilcoxon Test was used for the comparisons between dependent samples. Categorical variables were reported as n (%). Fisher Freeman Halton test was used for comparing categorical variables. The Statistics Statistical Analysis SPSS 22 (SPSS IBM) program was used, and $P<0.05$ was considered significant.

RESULTS

This lecture was attended by 45 students and 32 students responded to the questionnaire. Among the students who participated in the study, 90.7% stated that they chose the Art Anatomy lecture voluntarily. Before the lecture, 56.3% of the students were interested in visual arts, whereas 18.7% were not. While 37.5% of the students were aware of the relationship between art and anatomy before the lecture, 25% were not aware of the relationship and 37.5% were undecided. On the other hand, the students who learned about the relationship between art and anatomy after the artistic anatomy lecture represent 90.6% of the students who participated in the study. A total of 93.8% of the students said that the art anatomy lecture showed that anatomy and art are intertwined. However, the students who agreed with the statement that this lecture would provide a deeper understanding of anatomy for medical students represented 75% of the students who participated in the study. The statement "Observation, imagination and creativity are very important when drawing anatomy" was accepted by 93.8% of the stu-

Table 1. Relationship between voluntary lecture choice and the importance of anatomy knowledge

		"I choose the lecture voluntarily"						
		0	**1**	**2**	**3**	**4**	**Total**	**P value**
"Anatomy knowledge is essential for good and accurate human works'.	**0**	0	0	0	0	0	0	**<0.001[a]**
	1	0	0	0	0	1 (100%)	1 (100%)	
	2	0	0	0	0	1 (100%)	1 (100%)	
	3	0	1 (14.3%)	1 (14.3%)	5 (71.4%)	0	7 (100%)	
	4	0	1 (4.3%)	0	1 (4.3%)	21 (91.3%)	23 (100%)	

[a]Fisher Freeman Halton Test

5-point Likert scale (0: Strongly Disagree; 1: Disagree 2: Undecided 3: Agree 4: Strongly Agree)

dents, while 6.2% were undecided. In total, 84.4% of the participating students agreed with the statement "The ability to analyse art plays an important role in improving the clinical observation skills of medical students." According to the survey, 87.5% of students stated that this lecture improved their observation skills, and 81.3% said that it improved their clinical observation skills. After taking the Artistic Anatomy lecture, 90.6% of the students stated that they understood the importance of art in medical education. And 93.8% of the students agreed with the statement "Knowledge of anatomy is essential for good and accurate human works". The anatomical structures that give aesthetics and shape to the external structure of the body, the contours formed by these structures under the skin, and the organs that give perspective to the superficial structure of the body have contributed to my understanding of superficial and topographical anatomy. Among the participants, 87.5% agreed with this statement, 9.4% were undecided, and 3.1 % disagreed. While 81.2% of the students who participated in the study agreed that the subjects taught in the Artistic Anatomy lecture were useful for their professional development, 9.4% stated that they did not find it useful. It was found that 87.5% of the students thought that it was a great privilege to be able to draw anatomical structures correctly while training to become a doctor. It was found that 87.5% of the students agreed with the statement 'depicting the human body through art is a wonderful experience', 3.1% disagreed and 9.4% were undecided. A proportion of 87.5 % of the students stated that their interest in both art and the anatomy lecture increased thanks to the enjoyable artistic anatomy sessions. When the students were asked to rate their satisfaction with the Art Anatomy lecture in general, taking into account all the conditions highlighted in the study, it was found that 93.8% of the students who took this lecture and participated in the study were satisfied and 75% of them were very satisfied.

In response to the open-ended question, 'What do

Table 2. Relationship between lecture impact and art analysis in enhancing clinical observation skills

		"This lecture improved my observation skills"						
		0	**1**	**2**	**3**	**4**	**Total**	**P value**
"Being able to analyse art plays an important role in improving medical students"	**0**	0	0	0	0	0	0	**<0.001[a]**
	1	0	0	0	0	0	0	
	2	2 (40%)	0	1 (20%)	2 (40%)	0	5 (100%)	
	3	0	0	0	6 (75%)	2 (25%)	8 (100%)	
	4	0	0	1 (5.3%)	1 (5.3%)	17 (89.5%)	19 (100%)	

[a]Fisher Freeman Halton Test

5-point Likert scale (0: Strongly Disagree; 1: Disagree 2: Undecided 3: Agree 4: Strongly Agree)

Table 3. Association between lecture impact and art analysis in improving clinical observation skills

		"This lecture improved my clinical observation skills"						
		0	**1**	**2**	**3**	**4**	**Total**	**P value**
"Being able to analyse art plays an important role in improving the clinical observation skills of medical students"	**0**	0	0	0	0	0	0	**0.002[a]**
	1	0	0	0	0	0	0	
	2	2 (40%)	1 (20%)	1 (20%)	1 (20%)	0	5 (100%)	
	3	0	0	0	4 (50%)	4 (50%)	8 (100%)	
	4	0	0	2 (10.5%)	3 (15.8%)	14 (73.7%)	19 (100%)	

[a]Fisher Freeman Halton Test
5-point Likert scale (0: Strongly Disagree; 1: Disagree 2: Undecided 3: Agree 4: Strongly Agree

you think is the most important thing you have learnt during this lecture?', the most common answers were: 'I have learnt that anatomy is not just a lesson, it is in every aspect of our lives. Without art, there would be great deficiencies in the most important part of medical science today. The pioneer in the development of anatomy is its intertwining with art'. The flow of the lecture was excellent. We realised once again that anatomy and art are intertwined. It was very important to understand and grasp anatomy through drawings. It was a fun and educational lesson.' To be a good doctor, it is imperative to know the science of anatomy, and artistic anatomy has multiplied this importance. With this lecture I saw the wonderful combination of anatomy and art and it increased my interest in art.

It was determined that there was a statistical difference between the answers given to the question 'I chose the lecture voluntarily' and the answers given to the question 'anatomy knowledge is essential for good and accurate human works' (P<0.001). The rate of those who agreed with the question 'knowledge of anatomy is essential for human works with good and accurate measurements' was higher in the group of those who agreed with the question 'I chose the anatomy lecture voluntarily'. The rate of those who strongly agree with the question 'knowledge of anatomy is essential for good and accurate human works' is higher in the group of those who strongly agree with the question 'I chose the anatomy lecture voluntarily' (Table 1). When the answers given to the question 'I chose the lecture voluntarily' were compared with the answers given to the other questions in the questionnaire, it was determined that there was no difference between the answers (P>0.05).

Table 4. Relationship between drawing anatomical structures and understanding superficial and topographic anatomy

		"It is a great privilege to be able to draw anatomical structures correctly while studying to become a doctor"						
		0	**1**	**2**	**3**	**4**	**Total**	**P value**
"The anatomical structures that give aesthetic and shape to the external structure of the body, the contours formed by these structures under the skin and the organs that give a perspective view to the superficial structure of the body contribute to my understanding of superficial and topographic anatomy"	**0**	0	0	0	0	0	0	**0.016[a]**
	1	1(100%)	0	0	0	0	1 (100%)	
	2	0	0	1(33.3%)	1(33.3%)	1 (33.3%)	3 (100%)	
	3	0	0	2(22.2%)	1(11.1%)	6 (66.6%)	9 (100%)	
	4	0	0	0	3(15.8%)	16 (84.2%)	19 (100%)	

[a]Fisher Freeman Halton Test
5-point Likert scale (0: Strongly Disagree; 1: Disagree 2: Undecided 3: Agree 4: Strongly Agree)

Table 5. Relationship between drawing anatomical structures and professional development

		"I think it is a great privilege to draw anatomical structures correctly during my training to become a doctor"						
		0	**1**	**2**	**3**	**4**	**Total**	**Pvalue**
"I think the subjects are useful for my development in terms of my profession"	**0**	0	0	0	0	1 (100%)	1 (100%)	**0.001[a]**
	1	1 (50%)	0	0	0	1 (50%)	2 (100%)	
	2	0	0	3 (100%)	0	0	3 (100%)	
	3	0	0	0	2 (50%)	2 (50%)	47 (100%)	
	4	0	0	0	3 (13.6%)	19 (86.4%)	22 (100%)	

[a]Fisher Freeman Halton Test

5-point Likert scale (0: Strongly Disagree; 1: Disagree 2: Undecided 3: Agree 4: Strongly Agree)

It was found that there was a difference between the responses to the question 'This lecture improved my observation skills' and the responses to the question 'Being able to analyse art plays an important role in improving medical students' clinical observation skills' (P<0.001). The proportion of those who agreed with the statement 'Being able to analyse art plays an important role in improving the clinical observation skills of medical students' was higher in the group of those who agreed with the statement 'This lecture improved my observation skills'. The proportion of those who strongly agreed with the statement 'Being able to analyse art plays an important role in developing medical students' clinical observation skills' was higher in the group who agreed with the statement 'This lecture improved my observation skills'. The proportion of students who strongly agreed with the statement 'This lecture has improved my observational skills' was higher in the group. In summary, students who believe that art analysis plays an important role in improving medical students' clinical observation skills also believe that the lecture has improved their observational skills (Table 2).

It was determined that there was a difference between the answers given to the question 'This lecture improved my clinical observation skills.' and the answers given to the question 'Being able to analyse art plays an important role in improving the clinical observation skills of medical students' (P=0.002). The rate of those who answered 'I am undecided' to the question 'Being able to analyse art plays an important role in improving the clinical observation skills of medical students' is higher in the group of those who strongly disagree with the question 'This lecture improved my clinical observation skills' (Table 3).

There was a statistically significant relationship

Table 6. Statistical relationship between representing the human body through art and professional development

		"It is a great experience to represent the human body through art"						
		0	**1**	**2**	**3**	**4**	**Total**	**P value**
"I think the subjects are useful for my development in terms of my profession"	**0**	0	0	0	0	1 (100%)	1 (100%)	**0.004[a]**
	1	1 (50%)	0	1 (50%)	0	0	2 (100%)	
	2	0	0	1 (33.3%)	2 (66.7%)	0	3 (100%)	
	3	0	0	0	2 (50%)	2 (50%)	4 (100%)	
	4	0	0	1 (4.5%)	3 (13.6%)	18 (81.8%)	22 (100%)	

[a]Fisher Freeman Halton Test

5-point Likert scale (0: Strongly Disagree; 1: Disagree 2: Undecided 3: Agree 4: Strongly Agree)

between the question ‘It is a great privilege to be able to draw anatomical structures correctly while studying to become a doctor.’ and the question ‘The anatomical structures that give aesthetic and shape to the external structure of the body, the contours formed by these structures under the skin and the organs that give a perspective view to the superficial structure of the body contribute to my understanding of superficial and topographic anatomy’ (P=0.016). Students who think that the body's external and superficial structures contribute to understanding anatomy also think it is a privilege to draw them correctly during medical training (Table 4).

There was a difference in responses to two questions: 'I think it is a great privilege to draw anatomical structures correctly during my training to become a doctor' and 'I think the subjects are useful for my development in terms of my profession' (P=0.001). Students who think the subjects are useful for their profession consider it a privilege to draw anatomical structures correctly while studying to become a doctor (Table 5).

The answers to the questions 'It is a great experience to represent the human body through art' and 'I think the subjects are useful for my development in terms of my profession' differed (P=0.04). Students who think that the subjects are useful for their development in terms of their profession think that it is a great experience to represent the human body through art (Table 6).

DISCUSSION

Artistic anatomy is an educational approach in which the anatomical structures of the human body are addressed from both a scientific and artistic perspective. These lectures are usually located at the intersection of art and medicine disciplines and aim to provide students with a deeper understanding of anatomical knowledge through artistic methods [10].

While artists learn anatomy to accurately represent body structures, medical students can use this approach as a method that enriches their learning process. Artistic anatomy lectures use drawing, sculpture, and other visual art techniques to understand the shape, volume, and movements of the body [11, 12]. In our study, it was observed that the artistic anatomy lecture made significant contributions in different areas such as visual memory, observational skills, and interdisciplinary thinking of medical students.

Visual Learning and Memory

Our study showed that the Artistic Anatomy lecture improved students' visual memory and analytical skills. In particular, 87.5% of students reported that their observation skills had improved as a result of the lecture. The importance of visual memory in medical education is widely discussed in the literature. For instance, previous research has emphasized the significance of visual memory, particularly in grasping topics that rely on visual elements such as surface anatomy. The findings indicate that when students engage in a learning process centered on visual memory during anatomy lectures, they retain the information more effectively [9]. Similarly, Tyler and Likova found that arts-based teaching strengthens visual memory and helps students to better remember what they have learned. The results of our study are consistent with these findings in the literature, confirming that art is an effective way to visualise knowledge in the medical education process. Therefore, the fact that students in our study reported that they strengthened their visual memory by taking this lecture supports previous research that art provides memory retention in the educational process [13].

Contribution to Observation and Analytical Thinking

Another important finding of our study was that the artistic anatomy lecture reinforced students' observation and analytical thinking skills. Students reported that the lecture increased their clinical observation skills 81.3% and helped them understand the connection between art and anatomy 90.6%. The effect of art-based education on observation skills has long been discussed in the literature. Mehta and Agius [14] revealed that observation through art improves students' clinical skills and enables them to pay more attention to details. They reported that art strengthens analytical thinking skills in students and allows them to achieve more successful results, especially in areas that require attention, such as patient assessment. In this context, the fact that the students in our study stated that their observational skills improved coincides with the findings in the literature that art-based anatomy education can be beneficial in clinical practice [14]. Another

study found that the arts improved students' skills such as attention to detail and analytical thinking [6]. The proportion of students in our study who reported improved observational skills is consistent with previous research that arts-based education improves not only visual memory, but also attention to detail and analytical thinking skills.

Interdisciplinary Learning and Integration of Art and Medicine

In our study, 90.6% of the students stated that the artistic anatomy lecture enabled them to make the link between art and anatomy and provided an interdisciplinary perspective. The contribution of interdisciplinary education to medical education is widely discussed in the literature. Emara stated that interdisciplinary education provides medical students with information integrity and contributes to the acquisition of different perspectives in clinical practice. This helps students to develop not only anatomical structures, but also aesthetic elements and analytical skills [15]. In this context, the results of our study support the interdisciplinary contribution of arts-based education to medical students. Bardes *et al*. [16] also found that art-based anatomy lectures not only improve students' anatomical knowledge, but also enhance their aesthetic perspective and support analytical thinking. In line with these findings, we see in our study that students' awareness of art has increased and this awareness, combined with medical knowledge, provides more comprehensive learning.

Convenience in Clinical Practice and the Role of Art

The usefulness and contribution of art anatomy lectures to clinical practice was also observed in our study. Of the students who participated in the study, 81.3% reported that the art anatomy lecture contributed to their clinical observation skills. This finding supports studies in the literature that address the contribution of art-based education to clinical assessment and observation skills. Weiss and Casazza [17] found that art-based education helps medical students to be better equipped in their transition to clinical practice and improves their observational skills. In this context, the proportion of students in our study who reported that the art-based anatomy lecture contributed to their clinical observation skills is consistent with the literature highlighting the clinical benefits of integrating art into medical education.

The results of our study demonstrate that art-based anatomy education enhances medical students' development in areas such as visual memory, observation skills, interdisciplinary thinking, and clinical practice. These findings, which are also supported by the literature, suggest that integrating art into medical education provides students with a more holistic learning experience. Previous research has indicated that art positively influences the development of visual memory and observation skills, aligning with the results of our study [9, 13]. Additionally, studies have shown that art contributes to clinical observation and analytical thinking skills, supporting the observed improvement in observation skills in our findings [6, 14]. Research has also highlighted that interdisciplinary education fosters information integration and helps students gain diverse perspectives; in this regard, the increased awareness of art observed in our study underscores the benefits of interdisciplinary approaches [15, 16]. Finally, literature on arts-based education suggests that it enhances clinical observation skills in practice, which is consistent with the outcomes of our study [17].

Limitations

This study was conducted at a single center with a small, volunteer sample (n = 32). Consequently, selection bias may have been introduced, and because the data rely solely on self-report, objective performance measures and long-term follow-up are lacking.

CONCLUSION

Evaluating the results obtained in comparison with the existing studies in the literature, we can say that art-based anatomy lectures have positive effects on medical education. We believe that the initial results of our study can guide anatomy educators on how much artistic anatomy can be included in medical education.

Ethical Statement

This study was approved by the İstanbul Yeni Yüzyıl University Science and Non-Medical Interventional Health Sciences Research Ethics Committee (Decision no.: 2024/12-1399, date: 03.12.2024).

Authors' Contribution

Study Conception: ZKB, BNÇG; Study Design: ZKB, BNÇG; Supervision: N/A; Funding: N/A; Materials: ZKB, BNÇG; Data Collection and/or Processing: ZKB, BNÇG; Statistical Analysis and/or Data Interpretation: ZKB, BNÇG; Literature Review: ZKB; Manuscript Preparation: ZKB and Critical Review: ZKB, BNÇG.

Conflict of interest

The authors disclosed no conflict of interest during the preparation or publication of this manuscript.

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Generative Artificial Intelligence Statement

The author(s) declare that no artificial intelligence-based tools or applications were used during the preparation process of this manuscript. The all content of the study was produced by the author(s) in accordance with scientific research methods and academic ethical principles.

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