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Investigation of the Perspectives of Medical Faculty Students in Different Terms on Anatomy Education

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ABSTRACT

Aim: The science of anatomy, which has a great importance in medical and health sciences, examines the human body, the systems that make up the body, the organs that make up the systems and the relations of organs with each other. As a cornerstone of medical education, students' perspectives on anatomy evolve with technological advancements and their journey to becoming physicians. The aim of this study is to investigate of the perspectives of medical faculty students in different terms on anatomy education.

Material and Methods: A total of 557 medical faculty students from Terms I to VI participated in the study.The survey prepared in Google Forms was sent to the students online via the WhatsApp application. Descriptive statistical analyses were used on the data.

Results: Analysis revealed that Term I-III students valued anatomy education more, while Term IV-VI students prioritized clinical practices. Term I-III students saw cadaver-based anatomy education as professionally important, whereas Term IV-VI students favored using 3-D anatomy materials in education.

Conclusion: We believe the anatomy curriculum should be reviewed and updated to enhance students' professional development. Integrating clinical sciences into a multidisciplinary approach may shift the perspectives of Term IV-VI students. This study will serve as a valuable resource for future research in medical and health sciences education.

Keywords: Anatomy; education; cadaver; medicine.

Farklı Dönemlerdeki Tıp Fakültesi Öğrencilerinin Anatomi Eğitimine Bakış Açılarının İncelenmesi

ÖZ

Amaç: Tıp ve sağlık bilimleri eğitiminde oldukça büyük bir öneme sahip olan anatomi bilimi, insan vücudunu, sistemlerini, organları ve organların birbirleriyle olan ilişkilerini incelemektedir. Tıp biliminin ve de eğitiminin temeli olarak kabul edilen anatomi eğitimine öğrencilerin bakış açısı gerek teknolojinin gelişmesine bağlı olarak gerekse hekim adayı olmaya yaklaşmasıyla değişiklik göstermektedir. Bu çalışmanın amacı, farklı dönemlerdeki tıp fakültesi öğrencilerinin anatomi eğitimine bakış açılarının incelenmesidir.

Gereç ve Yöntemler: Çalışmaya tıp fakültesinde okuyan Dönem I-VI öğrencilerinden toplam 557 kişi katıldı. Öğrencilere "Whatsapp" uygulaması üzerinden "Google Forms"ta hazırlanan anket çevrimiçi olarak gönderildi. Verilerde tanımlayıcı istatistiksel analizler kullanıldı.

Bulgular: Analiz sonuçlarına göre Dönem I-III öğrencilerinin anatomi eğitimine daha çok önem verdikleri belirlendi. Dönem IV-VI öğrencilerinin ise klinikte uygulamaların daha önemli oldukları düşüncesine sahip oldukları belirlendi. Dönem I-III öğrencilerinin mesleki açıdan kadavra üzerinden anatomi eğitiminin önemli olduğu düşüncesine sahip oldukları gözlendi. Dönem IV-VI öğrencilerinin anatomi eğitimde üç boyutlu anatomi materyallerinin de kullanılması gerektiği düşüncesine sahip olduğu tespit edildi.

Sonuç: Sonuç olarak öğrencilerinin aldığı anatomi eğitiminin içeriğinin tekrar gözden geçirilerek öğrencilerin mesleki gelişimleri için yeni bir müfredat hazırlanması gerektiği kanısındayız. Anatomi eğitiminin klinik bilimlerle multidisipliner bir müfredata sahip olmasının Dönem IV-VI öğrencilerinin fikirlerini değiştirebileceğini düşünmekteyiz. Bu çalışma anatomi eğitimi açısından tıp ve sağlık bilimleri alanlarında yapılacak çalışmalar için bir kaynak oluşturacaktır.

Anahtar Kelimeler: Anatomi; eğitim; kadavra; tıp.

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INTRODUCTION

Anatomy education in medical and health sciences is very important for physicians and healthcare professionals who will be trained in these fields. Anatomy is a science that examines the normal structure and shape of the human body, the organs in this structure and the relationships of the organs with each other. In order to emphasize the importance of anatomy in the field of medicine, the expression "medicine cannot exist without anatomy" is widely expressed (1).

Anatomy education is carried out in two parts as theoretical and practical (laboratory practice) education in all medical faculties. Following the theoretical courses, a practical (laboratory practice) education is provided according to the infrastructural sufficiency of the university. Many different methods such as three-dimensional digital visuals, models made of plastic or similar material and dissection on cadavers are applied within the scope of this education (2,3).

The basis of anatomy education is cadaver and education for this science used to be based on only cadaver. Today, in the light of technological developments, the emergence of sub-branches such as clinical, surgical and radiological anatomy, kinesiology and functional anatomy has provided integrity with the living human body (1, 4). Therefore, anatomy studies and education are based on gross anatomy and cadaver dissection and include many subspecialty areas to the smallest microscopic structure (4). In the present developing age, there have been great additions to anatomy education and model computer assisted learning and three-dimensional models have begun to be used. In addition, computed tomography (CT) and magnetic resonance imaging (MRI) techniques are also included in anatomy courses as supportive methods (5,6). Despite so many developments and advancements, no technological invention has yet been able to replace anatomy education and practices through cadavers (7,8).

In many countries in the world, cadaver supply and the sustainability of medical education through cadaver is considered to be a major problem. Zhang et al. stated that cadaver donation in China lags behind other countries which threatens to create disadvantages in medical education (9).

As a result of our observations, we found that medical faculty students in terms IV to VI considered the anatomy education they received in terms I to III to be unimportant. We designed this study based on the statements of medical faculty term IV-VI students that "clinical education is more difficult and more valuable". Our aim in this study is to examine the perspective of medical faculty students studying in different terms about anatomy education.

MATERIAL AND METHODS

This study was conducted with the permission of The Duzce University Non-interventional Clinical Research Ethics Committee (Code:2023/80). A total of 557 medical faculty students from the first term to sixth term studying in different universities participated in the study. Students from universities with cadavers were recruited for the study.

The survey prepared in "Google Forms" was sent online to students through "Whatsapp" application. After information about the survey was stated in the survey text sent to students, the students were asked to be voluntary participants. In order to increase the reliability of the feedback, it was stated in the survey text that the students who filled in the survey did not have to write their names and student numbers. In this way, it was ensured that the students could express their ideas more clearly without being under pressure. The questions prepared were designed as multiple choice questions, and open-ended questions were used as rarely as possible. Two data collection tools were used in the study. The first one is "The Student Information Form". This form included open ended questions such as the students' age, gender and term. The second data collection tool included students' views about the models, cadavers or 3-dimensional education materials used during the anatomy education. This data collection form aimed to find out what the perspective of medical school students for anatomy education in different terms was and how their views changed over the years. The responses to the questions in the second part were "strongly disagree, disagree, undecided, agree, strongly agree" (10).

In the Power analysis, in case of α:0.05 1-β (power): 0.80, it was calculated that there should be at least 49 subjects from each term for the average change of 1 unit in the feedback of students in different terms about anatomy education.

Statistical Analysis

Descriptive statistics were used in the analyses. SPSS Statistics 25.0 (IBM Corp., Armonk, NY, USA) for Windows package program was used for analyses. Shapiro-Wilk test was used to determine whether the data were normally distributed. As a result of the analysis, it was determined that the data were not normally distributed. Therefore, median, minimum and maximum values of the data were given. The values for gender were given in numbers and percentages, and the results obtained were given as percentages.

RESULTS

A total of 557 students between the ages of 18 and 32 participated in the study. A total of 108 (20%) first term students, 102 (18%) second term students, 90 (16%) third term students, 88 (16%) fourth term students, 85 (15%) fifth term students and 84 (15%) sixth term students participated in the study. The number of students who participated in the study according to their term, genders of the students and median (min-max) values of their ages are shown in Table 1.

Table 1. Number (%), gender and age distribution of students according to terms

Term	Number (%)	Gender (Number)		Age (years)		
		Male	Female	Median	Min	Max
I	108 (20)	58	50	18	18	22
II	102 (18)	51	51	20	19	24
III	90 (16)	46	44	20	19	25
IV	88 (16)	42	46	23	21	26
V	85 (15)	40	45	24	22	29
VI	84 (15)	44	40	25	23	32

The questions in the second data collection part of the survey are shown in Table 2. The answers with the highest rates given to survey questions by students from different terms are shown in Table 2 with their rates. The answers given to questions in Table 2 were analyzed. The questions were about the functioning of anatomy education. The aim was to show the importance of anatomy education from the perspectives of medical doctor candidate students. Students' opinions about anatomy and cadaver education were questioned.

Table 2. Answers with the highest rates to the questions in the second part of the survey

Questions	Term					
	I	**II**	**III**	**IV**	**V**	**VI**
I need/needed the use of auxiliary tools and materials other than cadaver in anatomy education.	SA (45%)	SA (44%)	SA (33%)	A (36%)	A (29%)	A (30%)
I think cadavers should be used in anatomy education.	SA (40%)	SA (34%)	SA (36%)	A (28%)	U (30%)	U (29%)
I would like to participate in cadaver dissection training after graduation.	SA (41%)	SA (46%)	SA (39%)	SA (35%)	U (29%)	U (29%)
I think that theoretical and practical anatomy courses will be more effective when taught on cadavers in terms of learning the course.	SA (51%)	SA (50%)	SA (39%)	A (30%)	U (30%)	U (31%)
I think that medical education with cadaver will provide/provided me with information and experience during the professional process.	SA (53%)	SA (49%)	A (34%)	SA (39%)	A (30%)	U (32%)
In anatomy education, 3-D modelling or working on models is superior to working on cadaver.	SDA (42%)	SDA (46%)	SDA (36%)	D (39%)	A (30%)	A (30%)
I think that cadaver education has an important place in terms of understanding and learning the anatomy course.	SA (42%)	SA (50%)	SA (49%)	A (37%)	D (29%)	D (28%)
I think that anatomy education on cadavers will contribute to my clinical practices.	SA (40%)	SA (43%)	SA (39%)	A (36%)	A (33%)	A (34%)
I think that education with cadaver dissection will affect doctor patient interaction positively.	SA (44%)	SA (44%)	A (35%)	A (30%)	D (36%)	SDA (39%)
Models and computer based education should replace cadaver dissection.	SDA (48%)	SDA (47%)	SDA (41%)	A (30%)	A (29%)	A (30%)
I think that anatomy education with dissection will affect my future choice of specialty.	SA (58%)	SA (55%)	SA (44%)	SA (38%)	A (30%)	D (35%)
I think that working on cadavers will make a serious contribution to medical students' hand and instrument skills related to medical-surgical procedures.	SA (43%)	SA (46%)	SA (35%)	U (30%)	A (38%)	A (39%)
I am planning to choose anatomy for speciality training.	SA (35%)	A (33%)	U (59%)	U (62%)	SDA (55%)	SDA (66%)

*SDA: Strongly Disagree, D: Disagree, U: Undecided, A: Agree, SA: Strongly Agree

When we look at the results in Table 2, it can be seen that the importance given to anatomy course and the value of the course decreases as students' terms increase. We believe that this is because of the relationships of students with patients during the fourth term when they start their clinical education and the following years. We can understand this better when we look at the answers of students in terms I-III and students in terms IV-VI to the questions "Models and computer based education should replace cadaver dissection", "In anatomy education, 3-D modelling or working on models is superior to working on cadaver" and "I think that theoretical and practical anatomy courses will be more effective when taught on cadavers in terms of learning the course".

DISCUSSION

The aim of this study was to examine the opinions of medical faculty students in different terms about anatomy education. As a result of the study, it was found that students in terms I-III gave more positive answers to questions related to the importance and functioning of anatomy course than students in terms IV-VI.

Anatomy is a course that is considered the cornerstone of medical education, it has been used in medical education since 1200s and visuality is at the forefront. Each healthcare professional who has contact with patients should have sufficient anatomy knowledge. Anatomy knowledge is also important for completing medical examination, making a diagnosis and communicating correctly with colleagues (6,11). In a study conducted in the USA, it was reported that 80.000 preventable deaths that occurred in hospitals in a year were due to insufficient knowledge of anatomy (12). This shows the quality of anatomy education in medical faculties.

In a study conducted by Ögenler et al., the participants stated that working on cadavers was superior to using three-dimensional modelling and models (13). In a study conducted by Uygur et al. on Term II students, 98.7% of the students stated that working on models in practical courses was very effective in learning anatomy (1). In our study, it was found that students in Term I-III attached more importance to cadaver education. It was found that Term IV-VI students, on the other hand, attached more importance to technology based education.

In the study conducted by Uygur et al., 86.1% of the students stated that cadaver was effective in learning anatomy, 87.3% stated that cadaver had an important place in anatomy education and 92.4% stated that explanation of the subject by the lecturer first made it easier to understand the subject (1). The present study supports the study conducted by Uygur et al.

It has been stated by many authors, including us, that no matter how sophisticated a software is in anatomy education, it can never replace cadaver education since it is still a two-dimensional image on the computer screen (14–16). Patel and Moxham reported that when compared with students who had no contact with cadavers, students who were exposed to dissection or who dissected cadavers showed better performance (17). Unlike this study, Joens et al. stated that the academic performance of students who had a non-cadaver based study was better than that of students who performed dissection (18). In a study conducted with 128 medical faculty students, Anyanwu

and Ugochukwu found that students who received education with cadavers were more successful in exams than students who did not (14). In the study by Uygur et al., 86% of the students stated that dissection on cadavers made significant contribution to anatomy education (1). In some studies, the results that cadaver is not a suitable training tool, that the general structure of cadaver is not exactly similar to the human body and the incisions made showed different reactions than living bodies led to the suggestion that cadaver did not contribute to clinical skills (6). In addition to all these, it was also stated that cadavers may pose a risk in terms of infectious diseases (19).

In a study by Arı and Şendemir, 92.2% of the students stated that anatomy education would not be possible without cadaver (20). Uygur et al. found that students were aware that cadavers and models used in practical courses were an important education material (1). Arı et al. found that 91% of the students thought cadavers should be included in anatomy education (21). In a study by Büyükmumcu et al., almost all of the students who participated in the survey stated that medical education should include cadaver education (22). In our study, it was found that Term I-III students thought cadavers should be used in anatomy education, while Term IV-VI students thought non-cadaver technological materials should be used.

Arı and Şendemir reported that 70.3% of the students in their study wanted to participate in cadaver dissections (20). In our study, the students were asked about their wish to participate in dissection after graduation. It was found that Term I-IV students mostly answered this question as "Strongly agree", while Term V and VI students mostly answered "Undecided".

Mark et al. stated that the experiences of confronting death and examining the human body benefited students and physicians. They found that medical doctor candidates who had these experiences when they were students got rid of their prejudices about the profession and they could contact more comfortably with patients (23). In a study by Ögenler et al., it was found that working on cadavers was considered a valuable education tool that developed students' hand and tool using skills (13). In the study by Uygur et al., students in Term II stated that the anatomy education they received was important professionally and that they could effectively use the information they learned in their professional lives (1). In the present study, it was found that students in Term I-III answered similar questions as "Strongly agree", while Term IV-VI students answered as "Agree" or "Undecided".

In the study conducted by Uygur et al. on Term II students, a great majority of the students stated that they considered choosing anatomy for their residency (1). In the present study, it was found that this question was mostly answered as "Strongly Agree" by Term I students, as "Agree" by Term II students, as "Undecided" by term III-IV students and as "Strongly Disagree" by Term V-VI students.

CONCLUSION

The main purpose of anatomy education in medical students is to teach basic anatomy to students, to provide professional hand skills to medical doctor candidates with cadavers, to ensure that basic medical knowledge and professional attitudes and values are used in harmony.

Medical education cannot be possible without anatomy. In this study, it was found that students thought anatomy education was less important as their terms increased. We believe that the new curriculum integrated with the clinic in anatomy education will change this view that seems to be negative. We think that anatomy education should be taught for longer periods of time and integrated with the clinic. In most medical faculties in Turkey, anatomy education is given in Term I and II. This period should be increased even more. Anatomy education should definitely be supported by cadaveric training in every medical school. The present study will contribute to similar future studies and anatomy education.

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