



Faculty of Dentistry Student opinions on Learning Neuroanatomy Lesson by Distance Education in the Covid-19 Process

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Publisher: MedDocs Publishers LLCOnline edition: <http://meddocsonline.org/>Copyright: © Boduc E (2023). *This Article is distributed under the terms of Creative Commons Attribution 4.0 International License***Keywords:** Covid-19; Dentistry education; Distance education; Hybrid education.**Abstract**

The Covid-19 pandemic has left very effective traces in every area in the world, and the health areas have been the most affected by this situation. One of these affected health areas is dentistry. In this study, the efficiency of the neuroanatomy course, which is difficult to understand even in face-to-face education, in the distance education process and alternative ways were evaluated through student opinions. Students learning neuroanatomy course in the first year of dentistry participated in the study. A total of 62 students, 30 male and 32 female, participated in the study. Questionnaire were made with a five-point Likert scale. Answered options were tabulated with frequency and percentage calculations. In the study, the answers given by female and male students of the faculty of dentistry were compared with the chi-square test. In the answers given to the questions, very important data were obtained in the process of teaching the neuroanatomy course with distance education. Although distance education is an undesirable model in the Covid-19 process, it is still carried out in many areas today. Distance education has now become an important tool in situations such as repeating and understanding the topics or explaining the parts that the students do not understand. It also provided an opportunity to test and implement hybrid education models.

Introduction

Anatomy is a science based on visual and three-dimensional perception [1]. The 'cadaver' material used in anatomy lessons with the death of the living body is a lesson tool for all health faculties (animal cadaver used in veterinary anatomy and human cadaver used in medical anatomy) that requires three-dimensional perception and is difficult to understand at first [2,3]. Because the living body has an enormous structure. Even most painters start with many faulty drawings while drawing pictures without mastering anatomy. Therefore, the anatomy of living things is really comprehended with the need of eye, touch and three-dimensional perception [1-4].

The importance of the cadaver as a lesson tool and the importance of learning by seeing and touching a three-dimensional structure is a subject that many anatomy articles deal with today [5]. Especially the digital software and digital course tools that emerged with the developing technology have brought the three-dimensional importance of learning anatomy to virtual reality [5,6]. However, it has been seen that the lessons given only with video application or digital software without the perception of touch do not fully meet the education and training, especially during the covid-19 process [6,7].



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The Covid-19 pandemic has been a very wearisome process affecting the field of health all over the world. The effects of this virus have brought along some problems in education as well as in the field of health. The subject of digital education and technological anatomy software, which has been discussed for years in the field of anatomy, has acquired a kind of mandatory usage area in the covid-19 process [8]. Because the disease has a high risk of transmission and death, it has led to the situation of going to distance education, which unfortunately required students to make digital applications. But, in fact, this situation has revealed the importance of the cadaver and the importance of learning by touching and seeing it live [8,9].

Teaching the anatomy course with distance education has made the neuroanatomy course a little difficult to understand. Neuroanatomy is perhaps one of the most difficult and difficult to understand subjects in anatomy. It is one of the anatomy subjects that are explained especially in the faculty of dentistry and that dentist candidates should know.

Neuroanatomy course is taught from models and cadavers in our faculty (Faculty of Dentistry, Kafkas University). In addition, the atlas and the course videos prepared by our own department are also helpful course tools. While it is very difficult to understand the lesson from cadavers and models, in distance education, education was carried out only through lesson videos and atlas photos.

In this article, the opinions of first-year dentistry students who enrolled in the academic year and taught neuroanatomy course, about the neuroanatomy course with distance education were taken. Bringing the data obtained from the study to the literature can be very productive in terms of the future of anatomy education and approaches to distance education.

Methods

This study was carried out with the permission of the ethics committee of Kafkas University Faculty of Medicine (Approval number: 2021/05; Decision: 14). The study was performed following the aid of the ethical standards down in the 1964 Declaration of Helsinki and its later amendments. The research was carried out on the opinions of the male and female students of Kafkas University Faculty of Dentistry in the 2020-2021 academic year. The data collection forms filled in the research were prepared on the web and sent to the students via e-mail. 62 students (30 male and 32 female students) answered the questions in the data collection form (Table 1 and 2). Questionnaire were made with a five-point Likert scale (strongly agree, agree, undecided, disagree, strongly disagree) [10]. The questions answered by the students were automatically analyzed with the program on the web system and the results were obtained with this program. The system automatically calculated the answered options with frequency and percentage calculation (Table 1 and 2). Practical video photos during distance education are also shown in figures 1 and 2.

Statistical Analysis

Statistical analysis was made using SPSS 22.0. The study is a cross-sectional research from analytical research. The answers given by the female and male students (2020-2021 academic year) of the first year of the dentistry faculty to the questions were statistically compared with the chi-square test. The results were scored at a 95% confidence interval, and p-value of <0.05 was considered significant. Chi-square test was applied to the answers given by male and female students, but no significant

difference was found in any of the questions. The sample size of the study was all first-year dentistry students (whole universe was included), and all of the students answered the questions on a voluntary basis. Each p-value actually explains a hypothesis. There is no significant difference according to the H=0 hypothesis (table 3).

Results

While most of the male students (43.3%) were undecided about the view that 'Distance Education is an extremely well thought-out educational model for NeuroAnatomy course', female students; 'I agree', 'I do not agree' and 'I am undecided' were given equal proportions (25%). 'I fully understand everything about distance education and neuro anatomy course.' While a high percentage of males gave the answer "I am undecided" (46.7%), female students gave the answer "I do not agree" (34.4%) with a high percentage. 'NeuroAnatomy course should be taught with distance education from now on.' while men gave a high percentage of "strongly disagree" (46.7%) answers to the opinion, female students gave a high percentage of "disagree" (34.4%) answers. Male students took a more definite attitude towards distance education, but female students gave an imprecise 'disagree' answer. 'The video processing of NeuroAnatomy Practice courses filled my lack of knowledge and understanding in the distance education process.' In the opinion of male students, while the answer of "I agree" (33.3%) is high, the answer of "I completely agree" (10%) is quite low. In other words, there is no complete sympathy for distance education here. For female students, 'agree' and 'totally agree' (28,1%) answers are equal. 'Neuro Anatomy practice courses are online videos, even though I am missing out, practice courses should be live and in a laboratory environment. Because seeing the truth of the course materials increases perception', both female (63.3%) and male students (71.%) gave a very high rate of 'I totally agree'. 'NeuroAnatomy practice lessons (via video) can be done entirely by distance education. Through this, the lesson can be learned just like on a cadaver.' In their opinion, boys and girls answered 'disagree' at almost the same rate (47.7; 46.9%). The high percentage of 'disagree' responses compared to the 'strongly disagree' response may indicate that they want distance education to be at a certain rate. 'NeuroAnatomy practice courses require three-dimensional and two-dimensional thinking and perception with the sense of touch. Therefore, part of the lesson should be video, and part of it (distance education) should be done in a live laboratory environment. (integrated education). 'While male students agreed with the opinion more definitively (43.3%), female students only answered 'I agree' (34.4%). 'NeuroAnatomy theoretical lessons should be given live in the classroom environment.' While male students were undecided (36.7%) in their opinion, female students answered 'I agree' (34.4%). 'For NeuroAnatomy theoretical courses, distance education, live classroom environment and an education model integrated with 3D software can be considered.' In their opinion, male students gave 'strongly agree' and 'agree' answers at the same rate (43.3%). On the other hand, female students gave the answer 'I agree' (43.8%) at a higher rate than the answer 'I totally agree' (34.4%). When it comes to the environment where distance education is taken; 'With distance education, I listen to the lesson more comfortably at home.' In their opinion, male students gave the answers 'I am undecided' and 'I disagree' equally (23.3%). In addition to this, the answer 'strongly disagree' to this opinion is the answer (20%) that comes after 'I am undecided' and 'I do not agree' (for male students). 'Because the NeuroAnatomy theory course is in latin

language and requires a three-dimensional perception, I think I will understand the course better with the facial expressions and gestures of the (live) instructor in the classroom environment.' When we look at the answers given by both male and female students, the answers of 'strongly agree' and 'agree' are at the highest rate. In male students, 'strongly agree' (40%) response was higher than 'agree' (33.3%); 'strongly agree' and 'agree' answers are equal (37.5%) among female students. 'Theoretical lectures in distance education can replace live listening to the theoretical lecture.' While male students gave a

high percentage of "strongly disagree" (33.3%) in their opinion; female students mostly answered 'agree' (37.5%). 'I think that the neuroanatomy course should be supported with face-to-face training because it is very difficult to imagine and perceive. Distance education unfortunately falls short of understanding.' While male students gave the answer "strongly agree" at a high rate, female students gave the answer "I agree" at a high rate. In the second place among the answers of female students, the answer of "I totally agree" is high. Considering the number of people, 13 girls answered "I totally agree" and 12 girls answered "I agree" (Table 1, Table 2).

Table 1: Percentage of frequency (f) that first year male students gave to the questions.

Male students of the first class dentistry faculty (N:30)	Totally Agree (%)	Agree (%)	Undecided (%)	Disagree (%)	Totally Disagree (%)
1-It is an extremely well-thought-out educational model for the distance education neuroanatomy course.	6,7	16,7	43,3	20	13,3
2-I fully understand everything about neuro anatomy course with distance education.	0	6,7	46,7	33,3	13,3
3-Neuroanatomy course should be taught with distance education from now on.	6,7	6,7	23,3	16,7	46,7
4-The video processing of Neuroanatomy Practice courses made up for my lack of knowledge and understanding in the distance education process.'	10	33,3	30	20	6,7
5-'Neuro Anatomy practice courses are online videos, even if my deficiency is corrected, practice courses should be live and in a laboratory environment. Because seeing the truth of course materials increases perception'	63,3	26,7	6,7	3,3	0
6-NeuroAnatomy practice lessons (via video) can be done entirely by distance education. Through this, the lesson can be learned just like on a cadaver.	3,3	3,3	6,7	46,7	40
7-NeuroAnatomy practice courses require three-dimensional and two-dimensional thinking and perception with the sense of touch. Therefore, part of the course should be video (distance education) and part of the course should be done in a live lab environment. (integrated education)	43,3	30	23,3	0	3,3
8-NeuroAnatomy theoretical lessons should also be done live in the classroom environment.	20	30	36,7	6,7	6,7
9-For Neuro Anatomy theoretical courses, both distance education, live classroom environment and an education model integrated with 3D software can be considered.	43,3	43,3	10	0	3,3
10-With distance education, I listen to the lesson more comfortably at home.	16,7	16,7	23,3	23,3	20
11-Since the neuroanatomy theoretical course is Latin and requires a three-dimensional perception, I think that I will understand the course better with the mimics and gestures of the (live) instructor in the classroom environment.	40	33,3	16,7	6,7	3,3
12-Theoretical lectures in distance education can replace live listening to the theoretical lecture.	6,7	6,7	30	23,3	33,3
13- I think that neuroanatomy course should be supported with face-to-face training because it is very difficult to imagine and perceive. Distance education unfortunately falls short of understanding the lesson.	36,7	30	16,7	13,4	3,3

Table 2: Percentage of frequency (f) that first year female students gave to the questions.

Female students of the first class dentistry faculty (N:32)	Totally Agree (%)	Agree (%)	Undecided (%)	Disagree (%)	Totally Disagree (%)
1-It is an extremely well-thought-out educational model for the distance education neuroanatomy course.	12,5	25	25	25	12,5
2-I fully understand everything about neuro anatomy course with distance education.	9,4	21,9	21,9	34,4	12,5
3-Neuroanatomy course should be taught with distance education from now on.	9,4	6,3	18,8	34,4	31,3
4-The video processing of Neuroanatomy Practice courses made up for my lack of knowledge and understanding in the distance education process.'	28,1	28,1	25	9,4	9,4
5-'Neuro Anatomy practice courses are online videos, even if my deficiency is corrected, practice courses should be live and in a laboratory environment. Because seeing the truth of course materials increases perception'	71,9	18,8	6,3		3,1
6-NeuroAnatomy practice lessons (via video) can be done entirely by distance education. Through this, the lesson can be learned just like on a cadaver.	12,5	0	6,3	46,9	34,4

7-NeuroAnatomy practice courses require three-dimensional and two-dimensional thinking and perception with the sense of touch. Therefore, part of the course should be video (distance education) and part of the course should be done in a live lab environment. (Hybrid education)	28,1	34,4	31,3	6,3	0
8-NeuroAnatomy theoretical lessons should also be done live in the classroom environment.	18,8	34,4	21,9	21,9	3,1
9-For Neuro Anatomy theoretical courses, both distance education, live classroom environment and an education model integrated with 3D software can be considered.	34,4	43,8	21,9	0	0
10-With distance education, I listen to the lesson more comfortably at home.	9,4	15,6	18,8	31,3	25
11-Since the neuroanatomy theoretical course is Latin and requires a three-dimensional perception, I think that I will understand the course better with the mimics and gestures of the (live) instructor in the classroom environment.	37,5	37,5	9,4	12,5	3,1
12-Theoretical lectures in distance education can replace live listening to the theoretical lecture.	9,4	15,6	21,9	37,5	15,6
13- I think that neuroanatomy course should be supported with face-to-face training because it is very difficult to imagine and perceive. Distance education unfortunately falls short of understanding the lesson.	37,5	40,6	6,3	12,5	3,1

Table 3: 'p' values of the comparison of the answers given by male and female students.

QUESTIONS	'p' values
1-It is an extremely well-thought-out educational model for the distance education neuroanatomy course.	0,619
2-I fully understand everything about neuro anatomy course with distance education.	0,09
3-Neuroanatomy course should be taught with distance education from now on.	0,533
4-The video processing of Neuroanatomy Practice courses made up for my lack of knowledge and understanding in the distance education process.'	0,393
5-'Neuro Anatomy practice courses are online videos, even if my deficiency is corrected, practice courses should be live and in a laboratory environment. Because seeing the truth of course materials increases perception'	0,803
6-NeuroAnatomy practice lessons (via video) can be done entirely by distance education. Through this, the lesson can be learned just like on a cadaver.	0,658
7-NeuroAnatomy practice courses require three-dimensional and two-dimensional thinking and perception with the sense of touch. Therefore, part of the course should be video (distance education) and part of the course should be done in a live lab environment. (Hybrid education)	0,409
8-NeuroAnatomy theoretical lessons should also be done live in the classroom environment.	0,411
9-For Neuro Anatomy theoretical courses, both distance education, live classroom environment and an education model integrated with 3D software can be considered.	0,472
10-With distance education, I listen to the lesson more comfortably at home.	0,868
11-Since the neuroanatomy theoretical course is Latin and requires a three-dimensional perception, I think that I will understand the course better with the mimics and gestures of the (live) instructor in the classroom environment.	0,864
12-Theoretical lectures in distance education can replace live listening to the theoretical lecture.	0,335
13- I think that neuroanatomy course should be supported with face-to-face training because it is very difficult to imagine and perceive. Distance education unfortunately falls short of understanding the lesson.	0,768

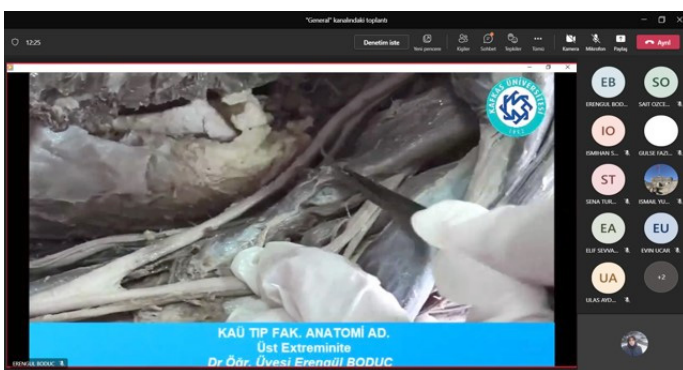


Figure 1: Explaining the peripheral nervous system; Plexus brachialis (upper limb) on cadavers with distance education.

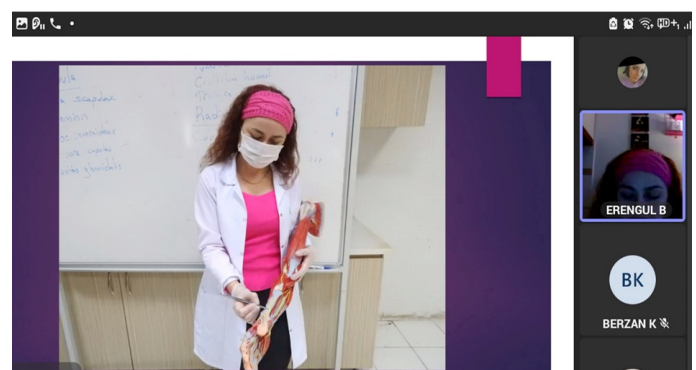


Figure 2: Explaining the peripheral nervous (radial nerve; ramus superficialis) system on models with distance education.

Discussion

Distance education is an education model that enters our lives with the covid-19 infection and is still up-to-date [11]. Although this education model has existed before, the necessity in the Covid-19 disease process has made the application of distance education widespread all over the world in all fields of education, as if bringing an alternative perspective to education [11,12]. Another area where distance education is applied is medical education. Although the subject of distance education in the field of medicine does not sound good, it has been a great alternative in the covid-19 process [13,14].

Neuroanatomy is a very difficult subject to comprehend and understand in dentistry as well as in medicine [15,16]. In this study, it is very important for the students' views on the understanding of the neuroanatomy course. Because while neuroanatomy is difficult to understand even with face-to-face education, teaching with distance education has created a very troublesome learning process [17].

In the study, first of all, students' perspectives on distance education were examined. In the first question, students' perspectives on distance education are not entirely negative. However, in the second and third questions, there is very little participation in the views of understanding neuroanatomy with distance education and teaching it with continuous distance education. When we look at the other questions, it is more desired by the students to make neuroanatomy practice lessons on face-to-face material. In theoretical courses, there is not a very large rejection rate for distance education.

Distance education can be considered as an additional alternative to actually participating in education life. Because students were introduced to a new system called hybrid education. Even if the virulence of the covid-19 disease has decreased significantly at the moment, it is still possible to apply to distance education from time to time. Distance education actually provided an additional alternative to educators, for example, when the subjects were not covered or when the students had questions about the subjects. In parallel with this situation, most of the students have a very positive attitude towards the possibility of teaching neuroanatomy lessons with hybrid education [18].

Another important reason for the reluctance created by distance education in students is to listen to lessons at home. Looking at the 10th comment on this subject, some of the students like to listen to lessons at home. But a significant majority want to listen to the lecture live. This situation can also show the students' desire to socialize. Because the number of people who want to listen to the lecture live, even the theoretical lectures, is quite high.

In the study, neuroanatomy practical lessons were shown with video footage on cadavers and models. In fact, it was tried to make the students feel as if they were in a laboratory environment. Students enjoyed learning with videos shot in this way (question 4), but the desire to learn by touching and seeing, in line with the answers from the students, unfortunately could not replace the video footage that tells the lesson (questions 5 and 7).

There are significant differences in some questions between female students and male students in the study (table 1 and 2). While female students generally have clearer and more precise answers to most questions, there is a spread to 5 options of the 5-Likert test for males.

In this study, students' views on distance education are very important. Neuroanatomy course was especially chosen for conducting the study. Because it is an anatomy lesson that is difficult to grasp and understand every year. Therefore, the situation in which a difficult course can be learned by distance education has been investigated. In line with the answers given, it has been revealed that video narration is a very useful application in distance education. In addition, distance education may offer important and useful alternatives to hybrid education. Distance education in the steps or applications related to hybrid education has presented an important idea to dentistry education.

Conclusion

Neuroanatomy is a very important subject in dentistry as well as in medicine. The study was carried out on dentistry students and important data were obtained. In particular, cadaver and model videos related to practical lessons have provided a better understanding of the subject in distance education. In addition, a preliminary assessment of hybrid education was made. A similar study can be done on medical students. It is a fact that both this study and other studies planned for distance education will give an important impetus to health education.

Conflict of Interest: Regarding this study, the author and/or her family members do not have a potential conflict of interest, scientific and medical committee membership or relationship with its members, consultancy, expertise, employment in any company, shareholding or similar situations.

Author Contributions: This work is entirely the author's own work and no other author's contribution has been received. Design: EB, Data collection or data entry: EB, Analysis and interpretation: EB Literature search: EB, Writing: EB

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Limitations part could be occurred and detailed like below: The study is limited with the replies of students who participated in the survey. The information collected is assumed to be accurate; It was assumed that the volunteers participating in the research gave their answers honestly. The data collection exercise is not a standard tool and can be validated in future studies.

Ethics approval: This study was carried out with the permission of the ethics committee of Kafkas University Faculty of Medicine (Approval number: 2021/05; Decision: 14).

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