

## The opinions of physiotherapy students on online anatomy education during Covid-19 pandemic

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### Abstract

**Objectives:** The aim of the present study was to explore the physiotherapy students' attitudes towards online anatomy education during Covid-19 pandemic and thus to evaluate the possible alternatives to improve online anatomy education.

**Methods:** Sixty-four out of 78 first term physiotherapy students (82%) participated in the study. Students were asked to participate voluntarily in an online survey composed of a Likert's scale questionnaire.

**Results:** The allocated study time of the students for Anatomy course decreased during the pandemic when compared to the time before the pandemic ( $p=0.014$ ). The statement which was marked as 'Totally Agree' at the highest rate (46.9%) was 'The questions given within the scope of the theoretical exam were consistent with the course contents'. The students also decided that the questions given within the scope of the theoretical exam were qualified to evaluate their level of anatomy. The marking rate of 'Totally Agree' option for this statement was 42.2%. In addition, the students 'Totally agree' at a rate of 40.6% that they felt less stressed in the exams of this course when compared to the first semester.

**Conclusion:** It is anticipated that interactive lectures would be more helpful to teach anatomy. Moreover, it seems that anatomy education in physiotherapy and rehabilitation departments may need revisions to improve online anatomy education.

**Keywords:** anatomy education; physiotherapy; online education

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### Introduction

In Turkey, the bachelor's degree of physiotherapy education is 240 ECTS points, standardized for four years of full-time study. Anatomy is a first year compulsory course with variable course hours in the curriculum (4–6 hours a week).<sup>[1–3]</sup> Hasan Kalyoncu University is one of a foundation universities in Turkey, in which physiotherapy students complete an anatomy course consisting of theoretical lectures at classroom and practical lectures in laboratory at their first year of education. Each semester consists of 14 weeks. Each week includes 4 hours of theoretical anatomy lectures and 2 hours of practical lectures on plastic models. Students have Anatomy I in the first semester and Anatomy II in the second semester. Specifically, Anatomy I covers the musculoskeletal system, and Anatomy II covers the circulatory, lymphatic, respiratory, endocrine, digestive, urogenital, and nervous systems.<sup>[4]</sup>

The Covid-19 pandemic caused termination of face-to-face education at all higher education institutions and

this made a shift of all theoretical and practical education at online platforms. In fact, online learning platforms became popular, especially in teaching practices in health education.<sup>[5]</sup> There have been millions of students and instructors trying to adapt to this change in higher education in the world. This huge change also had an impact on anatomy education. New methods of teaching and learning anatomy during the pandemic were clearly needed. In Hasan Kalyoncu University, we tried to support the distance education by using the most appropriate Youtube videos, videos taken by the instructors, digital cadaver atlases, and interactive anatomy atlases. Lectures were conducted live and online in real time using a private Adobe Connect classroom (4 hours theoretical and 2 hours practical in a week). We have created a content to increase the interactions between the students and the instructor.

The aim of this study was to explore the physiotherapy students' attitudes towards online anatomy education during Covid-19 pandemic and thus to evaluate the

possible alternatives to improve the online anatomy education

## Materials and Methods

Present study includes the opinions and perceptions of the first year physiotherapy students studying at Hasan Kalyoncu University on online anatomy education during pandemic. Seventy-eight students who took the Anatomy II lecture in the spring semester of 2019–2020 were included in the study. The students were asked to participate voluntarily and were motivated to join the survey by being told that they would have an important contribution to the development of online anatomy education during pandemic. The questionnaire used in the study were prepared as an online form. Data collection questions were prepared with a five-point Likert scale (completely agree, agree, no idea, disagree, completely disagree). Sixty-four students (82%) answered the questionnaire on an online platform.

Data were obtained by an online questionnaire, prepared by the researchers (with 10 years of experience in anatomy education and 35 years of experience in physiotherapy, and both researchers had experience on scale development) in accordance with the literature. The survey included questions about the demographic characteristics, grade points (based on a 100-point scale), and thoughts about online anatomy education during the pandemic, and study hours for this course during pandemic. A Likert's scale was used in 28 questions were including options such as completely agree, agree, no idea, disagree and completely disagree (Table 1). The purpose of the study was explained to the students and the online questionnaires were given to them. It was optional for students to write their identity for the reliability of the feedback.

Statistical analysis was performed by SPSS (Version 20.0, Armonk; NY, USA). Data were examined as frequency and percentage. Paired sample t-test was used for comparing differences. A  $p \leq 0.05$  was considered as statistically significant.

## Results

Thirty females (62.5%) and 24 males (37.5%) with a mean age of  $20.48 \pm 2.16$  (min-max: 18–29) years participated to this study. The anatomy exam scores of the participants are shown in Table 2. Although the contents of the courses were different, the scores of the Anatomy II course (online education) were quite high when compared to the Anatomy I course (face-to-face education) scores.

The students stated their average study time as  $2.59 \pm 0.92$  hours per week before the pandemic, the average time was determined as  $2.30 \pm 0.85$  hours per week

**Table 1**  
The questionnaire items of the survey.

1.	Anatomy online education courses were clear and understandable.
2.	The instructor was more effective in this method than the classical method.
3.	I understood and learned this course with online education method.
4.	The theoretical materials, which used in online education were sufficient.
5.	The model visuals, which used in the practical part of the course were sufficient.
6.	The videos, which used in the practical part of the course were sufficient.
7.	The theoretical course duration was sufficient.
8.	The practical course duration was sufficient.
9.	Online anatomy education was as effective as listening to the lecture face to face.
10.	The practical courses of online anatomy education were as effective as the face to face lectures in the laboratory.
11.	The online anatomy education was enjoyable.
12.	Anatomy online education was contributed to my physiotherapy education.
13.	Online anatomy education was contributed to my perspective on the profession.
14.	I listened most of the online anatomy lectures during the live lecture time.
15.	I listened most of the online anatomy lectures from the recordings.
16.	The lecture recordings allowed me to learn by myself.
17.	It was easier to communicate with the instructor during the online lessons.
18.	It was possible to interact with my classmates during the online lessons.
19.	I was able to ask the questions easily to the instructor during the online lessons.
20.	I was able to answer the questions asked by the instructor during the online lessons.
21.	The questions given within the scope of the theoretical exam were consistent with the course contents.
22.	The questions given within the scope of the theoretical exam were qualified to evaluate my level of anatomy.
23.	I felt less stressed in the exams of this course when I compared to the first semester.
24.	My technical problems during the online lesson negatively affected the course flow.
25.	The technical problems of the instructor during the online lesson negatively affected the course flow.
26.	To see the instructor through the webcam during the online lessons would have been even more effective at raising my attention.
27.	I would rather listen to Anatomy I lesson online.
28.	I would like to be able to attend the online anatomy lessons via my webcam.

during the pandemic. It is seen that the allocated study time by the students for Anatomy II course significantly decreased during the pandemic when compared to the one before the pandemic ( $p=0.014$ ) (Table 3).

The first responses out of top three the students have given their opinions as 'Totally agree' was 'The questions were given within the scope of the theoretical exam were consistent with the course contents'. The rate of 'Totally agree' responses were 46.9%. The second one was 'The questions given within the scope of the theoretical exam

**Table 2**

The anatomy examination scores of the participants (n=64).

Score	Anatomy I course n (%)	Anatomy II course n (%)
AA (90–100)	3 (4.68)	52 (81.25)
BA (85–89)	8 (12.5)	8 (12.5)
BB (80–84)	14 (21.87)	3 (4.68)
CB (70–79)	18 (28.12)	1 (1.56)
CC (60–69)	12 (18.75)	-
DC (55–59)	4 (6.25)	-
DD (50–54)	2 (3.12)	-
FF (40–49)	3 (4.68)	-

were qualified to evaluate my level of anatomy.’ The rate of ‘Totally agree’ responses for this statement was 42.2%. The third response was ‘I felt less stressed in the exams of this course when I compared to the first semester.’ The rate of ‘Totally agree’ responses for this statement was 40.6%. The top three responses that the students have

**Table 3**

Study times for Anatomy II course before and during the pandemic.

	Mean time±SD (hour)	Min-max (hour)	T	p-value
Before pandemic	2.59±0.92	1–4	2.534	0.014*
During pandemic	2.30±0.85	1–4		

\*p&lt;0.05 statistically significant.

given their opinions as ‘Totally Disagree’ were as follows: ‘I would like to be able to attend the online anatomy lessons via my webcam’, had a rate of 26.6%. ‘I would rather listen to Anatomy I lesson online’, had a rate of 20.3%. ‘Online anatomy education was as effective as listening to the lecture face to face’, had a rate of 18.8%. ‘The practical courses of online anatomy education were as effective as the face to face lectures in the laboratory’, had a rate of 18.8% (Table 4).

**Table 4**

The students’ responses to the online anatomy education.

Question number	Completely agree n (%)	Agree n (%)	No idea n (%)	Disagree n (%)	Completely disagree n (%)
1	19 (29.7)	23 (35.9)	16 (25)	5 (7.8)	1 (1.6)
2	8 (12.5)	21 (38.2)	24 (37.5)	8 (12.5)	3 (4.7)
3	11 (17.2)	23 (35.9)	20 (31.3)	9 (14.1)	1 (1.6)
4	14 (21.9)	30 (46.9)	14 (21.9)	5 (7.8)	1 (1.6)
5	13 (20.3)	29 (45.3)	17 (26.6)	5 (7.8)	- (0)
6	15 (23.4)	22 (34.4)	22 (34.4)	5 (7.8)	- (0)
7	20 (31.3)	32 (50)	10 (15.6)	1 (1.6)	1 (1.6)
8	16 (25)	25 (39.1)	17 (26.6)	5 (7.8)	1 (1.6)
9	8 (12.5)	14 (21.9)	10 (15.6)	20 (31.3)	12 (18.8)
10	8 (12.5)	8 (12.5)	16 (25)	20 (31.3)	12 (18.8)
11	12 (18.8)	13 (20.3)	16 (25)	15 (23.4)	8 (12.5)
12	12 (18.8)	25 (39.1)	13 (20.3)	6 (9.4)	8 (12.5)
13	9 (14.1)	20 (31.3)	19 (29.7)	9 (14.1)	7 (10.9)
14	22 (34.4)	27 (42.2)	10 (15.6)	5 (7.8)	- (0)
15	7 (10.9)	27 (42.2)	8 (12.5)	15 (23.4)	7 (10.9)
16	15 (23.4)	34 (53.1)	10 (15.6)	4 (6.3)	1 (1.6)
17	12 (18.8)	26 (40.6)	12 (18.8)	12 (18.8)	2 (3.1)
18	13 (20.3)	31 (48.4)	9 (14.1)	9 (14.1)	2 (3.1)
19	19 (29.7)	36 (56.3)	3 (4.7)	6 (9.4)	- (0)
20	14 (21.9)	33 (51.6)	11 (17.2)	5 (7.8)	1 (1.6)
21	30 (46.9)	33 (51.6)	1 (1.6)	- (0)	- (0)
22	27 (42.2)	34 (53.1)	3 (4.7)	- (0)	- (0)
23	26 (40.6)	26 (40.6)	7 (10.9)	3 (4.7)	2 (3.1)
24	18 (28.1)	27 (42.2)	10 (15.6)	7 (10.9)	2 (3.1)
25	15 (23.4)	17 (26.6)	20 (31.3)	10 (15.6)	2 (3.1)
26	13 (20.3)	26 (40.6)	14 (21.9)	11 (17.2)	0
27	8 (12.5)	13 (20.3)	8 (12.5)	22 (34.4)	13 (20.3)
28	2 (3.1)	14 (21.9)	14 (21.9)	17 (26.6)	17 (26.6)

n: number of the students who answered the related statement.

## Discussion

Students' feedback is the most common, reliable and valid method for assessing the educational effectiveness.<sup>[6]</sup> Covid-19 pandemic made many institutions to switch to online education in a very short time but the effectivity of the online teaching could not be evaluated before this shift. The present study was based on evaluating the opinions of physiotherapy students to online education during pandemic period and showed considerable results. One of the most important result of our study was the difference between the study time allocated to anatomy courses during and before online education. The students stated that they spent less time on studying this course during pandemic. The suggestion of the Council of Higher Education was including homeworks in evaluation of students together with multiple choice or other types of written exams. Accordingly, the education council of our university decided to evaluate the success of the students with both homeworks and online theoretical examinations. The homeworks contributed 60% and the online exams contributed 40% of the students' total score. This evaluation system might have eliminated the exam anxiety of students and made them to study less.

It is already known that the exam anxiety is a factor that negatively affects the students' success. Anxiety levels are especially high in performance based course exams such as applied sciences and vocational courses. Anxiety and lack of self-esteem during practical exams, or performance-based reactions during the exam (such as fainting, freezing) may affect correct thinking and remembering, and lead to failure in the exam.<sup>[7,8]</sup> In the present study, the students stated that they felt less stressed during the exam when compared to the previous face-to-face education period.

As there are advantages and disadvantages of face-to-face education, online education also has both advantages and disadvantages.<sup>[9]</sup> When the students in our study were asked whether they wanted to follow to the Anatomy I course online or not, most of the students answered as "Completely disagree". They also marked "the Anatomy II course was as effective as face-to-face education" and "the practical lectures of the Anatomy II course was as effective as the laboratory lectures" statements as "Completely disagree" at high rates. Distance education might have handicaps and disadvantages such as technological deficiencies and lack of communication with the instructors that may negatively affect students' ideas about distance education.

Actually, traditional teaching methods are thought to be inadequate to respond to the divergent expectations of generation Z. For this reason, it has become imperative for educational institutions to support their curricula with

innovations and advanced technology.<sup>[10]</sup> Although the creation of emergency training methods on online platforms during the Covid-19 pandemic process was suitable for the interest of generation Z in technology, the familiarity of the lecturers with the classical education methods may cause problems with the adaptation to the technology-based training methods. Evans et al.,<sup>[11]</sup> stated that anatomists are successful in adapting this process easily, and able to bring educational materials to online platforms. The fact that our course materials were not designed for the technology-based education. This may be the reason for the students' negative thoughts on online education. Despite the handicaps, this process also taught lecturers a lot. We started to expand our course materials and searched for new resources. Developing resources and education methods on online education system would make them suitable for to use after the pandemic as well.

We think that this urgent change in the world education sector can contribute to general anatomy education. The quality of anatomy education can be increased by taking the opportunities of this situation, and the most efficient online anatomy education can be decided by learning from negative experiences during pandemic.

This study is limited with the answers of students who gathered in the survey. The participants involved in the study were assumed to give their answers honestly. This was a cross sectional study, but perhaps it could be strengthened by a longitudinal approach and the questionnaire could be validated for the future studies.

## Conclusion

This pandemic will have important effects on the modernization of anatomy education in the future. We have attempted to share our experiences with the purpose of improving online anatomy education. We hope that the study will contribute to the development of online education techniques, to the effectiveness of online anatomy lectures as well as an increase in the quality of education.

As a result, it is anticipated that interactive lectures would be more effective to attract attention of the students towards anatomy learning. Moreover, it seems that anatomy education in physiotherapy and rehabilitation departments may need revisions to improve online education.

## Conflict of Interest

The authors declare no conflicts of interest.

## Author Contributions

YY: design, analysis, revising the draft, approval of the final version of the manuscript; BT: design, data collection,

analysis, revising the draft, approval of the final version of the manuscript.

### Ethics Approval

This study was a cross-sectional and descriptive study. All participants were properly informed about the study. Ethics approval was obtained from the Local Ethical Committee of Hasan Koyuncu University (date-decision no: 28/05/2020-2020/038). The study was conducted in accordance with the principles of the Declaration of Helsinki.

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