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COMPARISON OF INFECTION RATES, QUARANTINE PERIODS, AND FEAR LEVELS IN UNDERGRADUATE PHYSIOTHERAPY AND REHABILITATION STUDENTS WHO HAD FACE-TO-FACE AND ONLINE EDUCATION DURING COVID-19 PANDEMIC: A SINGLE-CENTER, CROSS-SECTIONAL STUDY

ORIGINAL ARTICLE

ABSTRACT

Purpose: The objective of the present study was to compare the rates of COVID-19 infection and quarantine periods, and COVID-19 related fear in undergraduate physiotherapy and rehabilitation students who continued their educations as online or face-to-face.

Methods: Three hundred and one students who continued their education during the 2020-2021 fall term as online (n= 144, for 1st and 4th degrees), or face-to-face under strict special precautions (n= 157, for 2nd and 3rd grades) were included. Demographic characteristics, COVID-19 infection diagnosis and quarantine due to contact were questioned via a structured online form. COVID-19 related fear was assessed by using the Fear of COVID-19 Scale.

Results: No statistical differences were detected regarding demographical characteristics and COVID-19 infection rates between the groups ($p > 0.05$). The online education group had higher quarantine rates due to contact with an infected person ($p = 0.040$), while the face-to-face group reported higher COVID-19 related fear ($p = 0.001$).

Conclusion: According to our results, although the COVID-19-related fears of student who received face-to-face education were higher than those who received online education, the quarantine numbers and infection rates were similar in both groups. Our results support that physiotherapy and rehabilitation education can be continued as face-to-face under special precautions. The precautions we used in our study may be benefited to continue face-to-face education in future pandemics.

Keywords: Education, Pandemic, Physiotherapy

COVID-19 PANDEMİSİ DÖNEMİNDE YÜZ YÜZE VE ÇEVİRİMİÇİ EĞİTİM ALMIŞ FİZYOTERAPİ VE REHABİLİTASYON LİSANS ÖĞRENCİLERİNDE ENFEKSİYON ORANLARI, KARANTİNA SÜRELERİ VE KORKU DÜZEYİNİN KARŞILAŞTIRILMASI: TEK MERKEZLİ, KESİTSEL BİR ÇALIŞMA

ARAŞTIRMA MAKALESİ

ÖZ

Amaç: Bu çalışmanın amacı, eğitimlerine çevrimiçi veya yüz yüze devam eden fizyoterapi ve rehabilitasyon lisans öğrencilerinde COVID-19 enfeksiyonu oranlarının, karantina sürelerinin ve COVID-19 ilişkili korkunun karşılaştırılmasıdır.

Yöntem: 2020-2021 güz döneminde çevrimiçi (1. ve 4. sınıflar, n=144) veya sıkı özel önlemler altında yüz yüze eğitimlerine (2. ve 3. sınıflar, n= 157) devam eden 301 öğrenci dahil edildi. Demografik özellikler, COVID-19 enfeksiyon teşhisi ve temasa bağlı karantina yapılandırılmış bir çevrimiçi form aracılığıyla sorgulandı. COVID-19 ilişkili korku, COVID-19 Korku Ölçeği kullanılarak değerlendirildi.

Sonuçlar: Gruplar arasında demografik özellikler ve COVID-19 enfeksiyon oranları açısından istatistiksel farklar saptanmadı ($p > 0,05$). Çevrimiçi eğitim grubu, enfekte bir kişiyle temas nedeniyle daha yüksek karantina oranlarına sahipken ($p = 0,040$), yüz yüze grup COVID-19 ilişkili daha yüksek korku bildirdi ($p = 0,001$).

Tartışma: Sonuçlarımıza göre, yüz yüze eğitim alan öğrencilerin COVID-19 ilişkili korkuları online eğitim alan öğrencilere kıyasla daha yüksek saptansa da, her iki gruptaki karantina sayıları ve enfeksiyon oranları benzerdi. Sonuçlarımız özel önlemler altında fizyoterapi ve rehabilitasyon eğitiminin yüz yüze sürdürülebileceğini desteklemektedir. Çalışmamızda kullandığımız önlemlerden ileride ortaya çıkabilecek salgın durumlarında yüz yüze eğitimin devam ettirilmesi açısından yararlanılabilir.

Anahtar Kelimeler: Eğitim, Pandemi, Fizyoterapi

INTRODUCTION

Since the first case was reported from Wuhan/China on 19 November 2019, the SARS-COV-2 virus continues to affect many aspects of daily living (1). The disease was named as the COVID-19 pandemic by the World Health Organization (WHO) in March 2020, and preventive precautions such as wearing masks, social distancing, and curfews were initiated worldwide (2). As 27 April 2022, the WHO reported approximately 510 million cases and more than six million deaths worldwide (3), while Turkey is one of the most affected countries with more than 15 million confirmed cases and around 100.000 deaths (4).

Preventive precautions were considered for working, education, and health-related issues, as well as leisure time activities. Many companies started home-office solutions for work-related demands (5). Similarly, educational services were delivered via online methods. However, while online education offered time flexibility, some limitations as family distraction during lectures (27%), and poor internet connection (%22) were reported (6).

Various countries attempted to re-open schools, while most of these attempts resulted increased number of cases (7). Different models of education were employed throughout the world. While some countries fully opened the schools, others partially opened the schools, and the rest completely closed schools (8). Turkey is a country where the schools were partially open and around seven million students continue their tertiary education (8).

While online education was preferred by the governments to decrease the number of cases, some negative effects were reported related to remote education as the closure of libraries, study rooms, and dormitories, and limitations of social interactions with other students and lecturers (9). While online education was considered safe, at the same time, there were concerns regarding inadequate education especially for the departments which had mainly practical applications in their curriculums such as medicine, nursing, physiotherapy, engineering, architecture, or arts (10,11).

Schechter-Perkins et al. advocated that safety of the educational environment should be ensured

by using a 4-pillar methods including epidemiologic controls (town prevalence metrics, diagnostic testing, quarantine strategies), administrative controls (state vaccination policies, alternative school models, symptom screens, quarantine breaks), engineering/environmental controls (distancing, outdoor space, ventilation), and personal protective equipment/hand hygiene (face coverings, hand sanitizing) (12). Providing data for each category is important for preventing infections. Thus, it was aimed to report infection rates, quarantine periods, and COVID-19 related fear in undergraduate physiotherapy and rehabilitation students who were educated by face-to-face or online education methods in the present study.

METHODS

Study Design

The present study was a cross-sectional study which was performed at Izmir Katip Celebi University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation.

Ethical approval was obtained from Izmir Katip Celebi University Social Research Ethical Committee (at 26.02.2021, no: 2021-SAE-0020) and required permission were got from Turkish Ministry of Health. All the students who were continuing their education at the Izmir Katip Celebi University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation were the sample of the study. Thus, all these students were invited to the study. The students were excluded if they did not wish to participate in the study, and/or suspended their education. The type of education was decided by the departments of the universities before the education term as face-to-face, online or mixed (hybrid) in Turkey. Our department decided to deliver undergraduate physiotherapy education by using the face-to-face method with special precautions for second and third grades (years), and by employing an online model for first and fourth grades (years). We have developed special precautions according to Republic of Turkey Ministry of Health 2020 Recommendations for the lectures of the face-to-face education and completed the fall term (13). The content of these precautions was presented below;

- Those who have symptoms of fever, cough, runny nose, respiratory distress should not attend classes and should apply to the nearest health institution.
- Wearing a mask during lectures is obligatory.
- Before entering the lecture hall, hands should be washed with soap and water for at least 20 seconds to ensure hand hygiene. In the absence of water and soap, alcohol-based hand sanitizer should be used.
- Tables, stools/chairs, exercise equipments, and other tools should be wiped with a disinfectant by the student before and after use.
- The number of students should be limited to 1 person per 4 square meters in the practical lecture hall.
- The seating plan should be done according to the social distance rules (at least 1 meter between students).
- The very same students (the buddies) must sit in together throughout the entire fall term.
- The buddies must practice with each other throughout the entire fall term.
- There should not be any exchange of books, notes, and pieces of equipments between students, except the buddies.
- Personal towels should be used during practical lectures where the face may touch the table and/or equipments.
- Food and beverages should not be brought to the halls.
- Alcohol-based hand sanitizers should be used in case of contact with the surfaces.

The data regarding COVID-19 infection status, quarantine status, and COVID-19 related fear were collected retrospectively for the 2020-2021 fall semester via using an online form at the end of the term among undergraduate students of Physiotherapy and Rehabilitation Department. Informed consents were obtained from students.

COVID-19 status and quarantine status were inquired by using the following structured questions such as:

- 'How many hours did you participate in online/

face-to-face lectures?'

- 'Were you diagnosed with COVID-19 since the start of the fall semester?'
- 'Were you quarantined due to COVID-19 or due to a possible contact with an infected person?'
- 'Averagely how many times were you outside of the house for a week except necessities?'

COVID-19 related fear was assessed by using the Turkish version of Fear of COVID-19 Scale with permission of the authors (14). It was a unidimensional seven-item scale and included questions such as 'I am afraid of losing my life because of COVID-19' or 'When watching news and stories about COVID-19 on social media, I become nervous or anxious.' The possible answers were ranged from 1 (strongly disagree) to 5 (strongly agree) on a 5-point Likert scale.

Statistical Analysis

IBM SPSS Statistics 21.0 (IBM, Raleigh, NC, USA) was used to perform the analysis. Kolmogorov-Smirnov test and histograms were used to evaluate the normal distribution. Due to the heterogeneity of the data, non-parametric analyses were preferred. Continuous data were described as median and interquartile ranges 25/75 (IQR 25/75), and categoric data was presented as numbers and frequencies. Mann-Whitney U test and Chi-Square test were utilized to compare the groups. A p-value of <0.05 was accepted as statistically significant.

RESULTS

A total of 301 students (80%), from 377 physiotherapy and rehabilitation students (face-to-face education group: n= 157, online education group: n= 144) completed the online forms. No statistical differences were detected regarding demographical characteristics ($p > 0.05$). The online education group had approximately 2-fold of higher COVID-19 positive rates, while the difference was not statistically significant ($p = 0.152$). The online education group had higher quarantine rates ($p = 0.040$), while the face-to-face group reported higher COVID-19 related fear ($p = 0.001$). Comparison of the groups was provided at Table 1.

In the online education group, while five students (3.5%) reported that they have never been outside

Table 1. Comparison of the Groups

	Face-to-Face Education Group (n: 157)	Online Education Group (n: 144)	p
Demographical Characteristics			
Age (years) median (IQR 25/75)	20 (20/21)	20 (19/22)	0.197*
Female Gender (n, %)	122 (77.7%)	104 (72.2%)	0.273**
Presence of Chronic Disease (n, %)	16 (11.1%)	11 (7%)	0.214**
- Asthma	6 (3.8%)	3 (2.1%)	
- Metabolic Problems	2 (1.3%)	3 (2.1%)	
- Cardiac Problems	3 (1.9%)	2 (0.7)	
- Rheumatic Diseases	2 (1.3%)	2 (1.4)	
- Panic Attack	-	1 (0.7)	
- Not reported	3 (1.9%)	-	
Weekly Education Hours			
- First Grades	-	23	
- Second Grades	16	-	0.406**
- Third Grades	20	-	
- Fourth Grades	-	26	
COVID-19 Status			
Positive (n, %)	6 (3.8%)	11 (7.6%)	0.152**
Quarantine History			
Quarantined n, (%)	19 (12.1%)	30 (20.8%)	0.040**
COVID-19 Related Fear			
Fear of COVID-19 Questionnaire (score) median (IQR 25/75)	20 (14/25)	17 (13/21)	0.001**

IQR 25/75: Interquartile ranges 25/75, *: Mann-Whitney U test, **: Chi-Square test, $p < 0.05$

of the house except necessities, nearly half of the students ($n = 62$, 43%) stated that they have been out more than twice weekly. These rates were similar for the face-to-face education group (never been out = 11 students, 7% vs. more than twice = 54 students, 34%). Ninety-four students (65%) from the online education group, 68 students (43%) from the face-to-face education group reported that they have never used public transport. In the online education group, 129 (89%) students were living with someone else (family, roommate, partner), and in the face-to-face education group, 115 (74%) students were in the same situation.

DISCUSSION

The present study aimed to investigate and compare the safety of a face-to-face and hands-on physiotherapy education program to an online-delivered program during the COVID-19 pandemic.

According to our results, a safe face-to-face and hands-on physiotherapy education might be possible under special precautions during the COVID-19 pandemic. Interestingly, we detected students who received online education spent significantly more time in the quarantine due to COVID-19. On the other hand, the COVID-19 related fear was higher in the face-to-face education group.

Generally, it is expected that students would stay at home when they receive online education. However, our results revealed that nearly half of the students in the online education group have spent time outside of the house more than twice weekly. We believe that recorded lectures enabled students to follow the lectures in a flexible time-line, thus, students might prefer spending some time outside of the house. To support our assumptions, Liu et al. compared the effect of three different educa-

tion methods as remote (virtual-only), face-to-face, and hybrid on case-growth rates of K-12 schools and reported hybrid education is less effective than preventing daily case-growth (odd ratio= 4.7) (14). On the other hand, they determined the odd ratios of face-to-face and remote education as 3.5 and 1.1, respectively (15). The authors also underlined that during online education students may not stay at home as they were expected (15).

The students in the online education group had higher rates of quarantine due to COVID-19 in the present study. This may be explained by being outside of the house more frequently. Besides, nearly 90% of these students were living with someone else. Therefore, the quarantine may have been imposed due to the infection of another person in the house.

Even though our result revealed that face-to-face education under special precautions was safe, the students who received face-to-face education reported higher COVID-19 related fear compared to online education group. However, the level of COVID-19 related fear was lower than medium level for both groups [median (IQR 25/75): 20 (14/25) for face-to-face education, and median (IQR 25/75): 17 (13/21) for online education] in our study. Similarly, a recent study investigated the COVID-19 fears of Turkish nursing students by using Fear of COVID-19 Scale and reported that the level of COVID-19 fear of Turkish nursing students (18.48 ± 6.87) was below the medium level (16). Another study by Iyigun et al. indicated that the level of COVID-19 related fear was 17.2 ± 7.0 for senior nursing students from Turkey (17). One may argue that these low rates regarding COVID-19 fear may be related to field of education. However, in their comprehensive study including 1213 students, Yeni Elbay et al. found that the COVID-19 related fear does not differ between medical and non-medical students (18).

Best to our knowledge, this is the first study that investigated the safety of a face-to-face and hands-on education physiotherapy program. Along with our results, Hacimustafaoglu advocated that with suitable precautions, transmission risk is less than expected and seems not to be higher than in other public places (19). Besides, Macartney et al. report-

ed that with effective case-contact testing and epidemic management strategies children and teachers did not contribute significantly to COVID-19 transmission via attendance in educational settings (20). Thus, we believe that our results may provide basic clues for re-starting face-to-face physiotherapy education in other institutions.

Even though online education seems essential nowadays, it was not considered an effective and satisfactory method for medical and nursing education (10,21,22). Baczek et al. reported that online medical education is considered equal to face-to-face education by the students in terms of increasing knowledge, however, it is less effective for improving skills and social competencies compared to traditional methods (23). Foo et al. compared the effects of online education and face-to-face education on academic performance in medicine students (24). The authors reported that the students in online education had significantly lower scores for proficiency which was investigated in five areas as participation, communication, preparation, critical thinking, and group skills (24).

Physiotherapy education includes many hands-on training lectures as physical assessments (palpation, range of motion assessment, muscle strength assessment, etc.) therapeutic exercises, electrotherapy, manual therapy, chest physiotherapy, transfers of disabled patients, and etc. (25). Therefore, it is crucial to perform hands-on practice to improve required skills. Recently, the views of allied health professionals (mostly physiotherapists, 82%) about tele-health during COVID-19 were inquired by Malliaras et al. (26). The authors detected that nearly half of the clinicians (42%) do not believe that tele-health was as effective as face-to-face care (26). This may also imply to education as well, and students who did not participate in hands-on lectures may feel inadequate regarding their professional skills. Supporting our opinions Ng et al. reported that physiotherapy students value face-to-face practical classes to learn and receive social support from peers and tutors (11).

The present study had some limitations. We have investigated the safety of face-to-face education of undergraduate physiotherapy education in the present study, however, the safety of internship

should also be investigated. In many physiotherapy programs, senior classes include an internship with real patients. The precautions may require differences for the internship in a clinical environment. The post-hoc power analyses revealed the power of the present study was 99%. Even though, our results are promising, they should be confirmed in multicentered cohorts. Including only one centre may limit the generalizability of the results. Besides, the data collected retrospectively in the present study. Future prospective studies may provide more reliable results.

According to our results, face-to-face and hands-on undergraduate physiotherapy education under strict precautions was comparable to online education regarding COVID-19 infection rates. It seems that undergraduate physiotherapy and rehabilitation education can be continued as face-to-face under special precautions. The precautions which were used in our study may help to authorities in the decision making processes for education during pandemics. In addition, our results may also serve to other health disciplines whose curriculum's have mainly practical lessons.

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Conflict of Interest: The authors report no conflict of interest.

Ethical Approval: This study protocol was approved by the Ethical approval was obtained from Izmir Katip Celebi University Social Research Ethical Committee (Approval Date: 16.02.2021) and required permission were got from Turkish Ministry of Health.

Author Contributions: Concept – U.Z.K; Design – U.Z.K, D.B, D.O.K; Data Collection and/or Processing – O.O; Analysis and/or Interpretation – U.Z.K, D.B ; Literature Research – D.B, O.O; Writing Manuscript – U.Z.K, D.B, O.O; Critical Review- D.O.K.

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