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ORIGINAL ARTICLE / ARAŞTIRMA YAZISI

Physiotherapy and Rehabilitation / Fizyoterapi ve Rehabilitasyon

Comparison of Physiotherapy Education on Course Basis in terms of Student Satisfaction During the Covid-19 Pandemic Period: Online, Hybrid, and On-Campus Education

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ABSTRACT

In the study, aimed to compare three different education periods, On-Campus Education (2019), Hybrid Education (2020), and Online Education (2021), in terms of students' satisfaction within the scope of the courses offered in Physiotherapy and Rehabilitation program. The dataset of study collected as a retrospective study from the Physiotherapy and Rehabilitation Department in Health Sciences Faculty of Yeditepe University, Istanbul. The spring semester students of 2019, 2020, and 2021 (respectively, n=170; n=158; n=229) participated in the study. Student satisfaction was obtained by evaluating the courses with the learning outcome questionnaire. Answers to the questionnaire are allowed upon a 6-point Likert scale (0:Strongly Disagree - 5:Strongly Agree). According to the Analysis of Variance (ANOVA) test results, in the Introduction to Physiotherapy Occupation, Hydrotherapy, Manipulative Therapy-II Functional Anatomy and Kinesiology-II, Neurologic Rehabilitation, Orthosis and Prosthesis Rehabilitation and Physiotherapy in Sport courses, statistically significant difference was found (respectively, p=0.005, p=0.001 p=0.009, p=0.001, p=0.018, p=0.001, p=0.001). According to the satisfaction of the Physiotherapy students at three-grade levels, the courses with high theoretical content may be given online. Therefore, the online system can be integrated into the physiotherapy education system, but it cannot replace campus education in practical courses.

Keywords: COVID-19; education; online education; pandemic; physical therapists.

Covid-19 Pandemi Döneminde Fizyoterapi Eğitiminin Ders Bazında Öğrenci Memnuniyeti Açısından Karşılaştırılması: Çevrimiçi, Karma ve Kampüste Eğitim

ÖZET

Araştırmada, Fizyoterapi ve Rehabilitasyon alanında verilen dersler kapsamında Kampüste Eğitim (2019), Karma Eğitim (2020) ve Çevrimiçi Eğitim (2021) olmak üzere üç farklı eğitim döneminin öğrenci memnuniyeti açısından karşılaştırılması amaçlanmıştır. Çalışmanın veri seti, Yeditepe Üniversitesi Sağlık Bilimleri Fakültesi Fizyoterapi ve Rehabilitasyon Bölümü'nden retrospektif olarak toplanmıştır. Araştırmaya 2019, 2020 ve 2021 bahar dönemi öğrencileri (sırasıyla n=170; n=158; n=229) katılmıştır. Öğrenci memnuniyeti, derslerin öğrenme çıktı anketi ile değerlendirilerek elde edildi. Ankete yanıtlar 6'lı Likert ölçeğiyle (0: Kesinlikle Katılmıyorum - 5: Kesinlikle Katılıyorum) alındı. Varyans Analizi (ANOVA) test sonuçlarına göre; Fizyoterapi Mesleğe Giriş, Hidroterapi, Manipülatif Terapi-II Fonksiyonel Anatomi ve Kinesiyoloji-II, Nörolojik Rehabilitasyon, Ortez ve Protez Rehabilitasyon ve Sporda Fizyoterapi derslerinde istatistiksel olarak anlamlı fark bulunmuştur (sırasıyla, p=0,005, p=0,001 p=0,009, p=0,001, p=0,018, p=0,001, p=0,001). Fizyoterapi öğrencilerinin üç sınıf düzeyindeki memnuniyetlerine göre teorik içeriği yüksek dersler online olarak verilebilir. Bu nedenle online sistem fizyoterapi eğitim sistemine entegre edilebilir ancak uygulamalı derslerde kampüs eğitiminin yerini alamaz.

Anahtar Kelimeler: COVID-19; eğitim; çevrimiçi eğitim; pandemi; fizyoterapist.

The Coronavirus 2019 (COVID-19) pandemic has affected the whole world, with a primary focus on the education system. In the pandemic, governments around the globe decided to have educational institutions switch from face to face education to online education in order to control the spread of disease. Turkey suspended face-to-face education and switched to the online system on March 14, 2020. The transition to online education affected many educational areas, educators, and students, especially those in Physiotherapy and Rehabilitation Departments.

During the unplanned entire lockout period, the Physiotherapy departments, which had rich practical lessons, had to deal with many difficulties such as technological devices and the lack of face-to-face communication (1-3). Given the immediate transition to online learning, many institutions and educators were not prepared for this new style of education. As the online systems continued to stay in effect, educators continually tried to make the online lessons more efficient. This was not only an issue in Turkey but similar difficulties were observed in many other countries (4). Researchers generally used questionnaires via Google Forms to determine student satisfaction with online learning (5). The questionnaires used by the researchers were attempts to identify the problems and concerns of students and educators about online education (5,6), and students' opinions were taken to investigate their views on the health and social effects of online education (7). In addition, the students' satisfaction and performance with the Physiotherapy and Rehabilitation education were also investigated with questionnaires (4).

Before the pandemic period, many studies looked at the effectiveness of online education. A systematic review and meta-analysis (21 studies) put together evidence on the effectiveness of adaptive e-learning environments to increase learning outcomes success (8). Another systematic review assesssed the effectiveness of online learning compared to traditional learning techniques (59 studies) and indicated that online learning was similar to if not superior to traditional learning and should be encouraged (9). Lastly, another systematic review (19 studies) looked into whether an online or blended learning paradigm improved teaching of clinical skills in undergraduate nursing programs (10). The researchers explained that for teaching clinical skills, knowledge development, and user satisfaction, online learning was no less effective than traditional approaches (10). Even with the research showing the success with online education, there was no immediate need for change.

The pandemic conditions increased the need for change and the use of technology in our lives at great speeds, especially with the transition to online education. This impact will forever change the way the education system is structured. In the future, educators and policymakers will start to implement online education in health sciences departments, and the studies on this subject are important for us to better understand and determine the needs and thoughts of our students.

In our study, we wanted to understand how students' satisfaction with self-asessment in terms of achieving learning outcomes in different educational periods. For the study, aimed to compare three different education periods, On-Campus Education (2019), Hybrid Education (2020), and Online Education (2021), in terms of students' satisfaction within the scope of the courses offered in Physiotherapy and Rehabilitation program.

Materials and Method

Study Design

In this retrospective study, the primary focus of the study consisted of determining the achievement level of the learning outcomes for each course based on the students' assessment.

In this retrospective study, the primary focus of the study consisted of the students self-assessment on the learning outcomes specific to each course, which were previously prepared by the instructor of each course. The student satisfaction on the learning outcomes was obtained from a questionnaire (the course learning outcomes questionnaire; CLOQ) that involved the learning outcomes of that semester's curriculum.

- In the 2019 spring semester (on-campus education period): CLOQ was presented to the participants face-to-face and obtained as hard-copies.
- In the 2020 spring semester (hybrid education period): 6 weeks of campus learning and eight weeks synchronized online learning. CLOQ were presented to the participants through Google Forms and obtained electronically.
- In the 2021 spring semester (online education period): CLOQ were presented to the participants through Google Forms and obtained electronically.

Participants

A total of 664 students were registered in the Yeditepe University Physiotherapy and Rehabilitation Department in the spring semestres of 2019, 2020 and 2021 as 1st, 2nd, and 3rd grade students. From these students, a total of 557 students participated in our study.

The students of 2019 were characterized as the on-campus education (CE) group, the students of 2020 were characterized as the hybrid education (HE) group, and the students of 2021 were characterized as the online education (OE) group. The inclusion criteria were determined as actively enrolled students in the Yeditepe University Physiotherapy and Rehabilitation Department. None of the participants were under any pressure to answer questions about the learning outcomes.

Procedure

The learning outcomes were obtained from the Bologna Information Package utilized by our department. The questionnaires were delivered to the students at the end of each spring term, before the final exams, and the students were asked to complete the questionnaire. The students were asked to answer questions about the learning outcomes for each course and score the question for each outcome between 0 and 5 points (0: Strongly Disagree - 5: Strongly Agree). Each score expressed the satisfaction levels of the students. Each student, included in the study, completed CLOQ for that semester only once. In addition, each student scored the learning outcomes only for their semester courses.

The scores of the first, second, and third-grade students on CLOQ were collected as quantitative data. Fourth grade students were not included in this study because they spent most of their semester in different clinics.

The first grade students answered the learning outcome questionnaries for Introduction to Physiotherapy Profession (IPO), Anatomy-II (ANA-II), Hydrotherapy (HYD), and Psychosocial Rehabilitation (PR) courses. The second grade students answered the learning outcome questionnaries for Principles of Therapeutic Movements (PTM), Electrotherapy-II (ELE-II), Functional Anatomy and Kinesiology (FAK-II), Manual Therapy-II (MT-II) Exercise Physiology (EP), Pharmacology (PHARM), and Pathology (PAT). The third grade students answered the learning outcome questionnaries for Neurological Rehabilitation (NEUR), Orthotics and Prosthesis Rehabilitation (OPR), Physiotherapy in Sports (PS), and Neurophysiological Approaches (NPA-II). All questionnaires were administered online or face to face.

Statistical Analysis

The data obtained, after filling out the questionnaires, were analyzed using SPSS (Statistical Package for Social Sciences) v23 software. Mean, standart deviation (SD), median, minimum, and maximum values were used to present quantitative variables. The learning outcomes scored by the students during campus education (2019 spring semester), hybrid education (2020 spring semester), and synchronized online education (2021 spring semester) were compared with a one-way analysis of variance (ANOVA). A Bonferroni correction was applied for post-hoc testing. The significance level for all statistical analyzes was determined as $p<0.05$.

Results

According to the results, the learning outcomes of the 1st graders showed no significant difference between the CE, HE, and OE groups of the ANA-II and PR courses ($p=0.085$; $p=0.235$). However, there was a statistically significant difference in the IPO and HYD courses ($p=0.005$; $p=0.001$). In the HYD course, the mean of the HE group was significantly higher than the CE group and the OE group ($p=0.001$; $p=0.003$). On the other hand, in the IPO course, the mean of the CE group was significantly lower than the HE group and the OE group ($p=0.041$; $p=0.005$) (Table 1).

In the learning outcome scores of the 2nd graders, there was no significant difference between the CE, HE, and OE groups of the ELE-II, PTM, EP, PHAR, and PAT courses (respectively, $p=0.409$. $p=0.896$, $p=0.871$. $p=0.863$, $p=0.174$). A statistically significant difference was found between the CE, HE, and OE groups of the MT-II course ($p=0.009$). In the comparison between groups of the MT-II course, the HE group was significantly lower than the OE group ($p=0.007$). In the comparison of the groups for the FAK-II course, a significant difference was found between the CE, HE, and OE groups, and the HE group was significantly lower than the OE and CE groups (respectively, $p=0.001$; $p=0.001$).

According to results, the learning outcomes of the 3rd graders, there was no significant difference between the CE, HE, and OE groups of the NPA-II course ($p=0.118$). However, a statistically significant difference was found between the CE, HE, and OE groups of the NEUR, OPR, and PS courses (Respectively, $p=0.018$; $p<0.001$; $p<0.001$). In the comparison between the groups of the NEUR course, a significant difference was found only between the CE and HE groups ($p=0.017$). On the other hand, in the OPR course, the CE group was significantly higher than the HE and the OE groups ($p=0.002$; $p=0.001$). Moreover, in the PS course, the CE group was significantly higher than the HE and the OE groups ($p=0.001$; $p=0.015$).

Table 1: The course learning outcomes questionnaire (CLOQ) results of the groups

Graders	Courses	2019-CE (n=170) mean±sd	2020-HE (n=158) mean±sd	2021-SOE (n=229) mean±sd	F	p-value	Semesters comparisons	p-value
2nd grade	IPO	3.78±1.34	4.27±0.76	4.35±0.85	5.538	**0.005**	2019-2020	**0.041**
							2019-2021	**0.005**
							2020-2021	1.000
	ANA-II	3.42±1.48	3.50±1.27	3.85±1.12	2.498	0.085	2019-2020	1.000
							2019-2021	0.117
							2020-2021	0.306
	HYD	4.12±1.17	4.70±0.52	4.21±0.94	6.399	**0.001**	2019-2020	**0.001**
							2019-2021	1.000
							2020-2021	**0.003**
	PR	4.24±0.98	4.56±0.68	4.50±0.84	1.460	0.235	2019-2020	0.275
							2019-2021	0.497
							2020-2021	1.000
	MT-II	3.65±1.36	3.22±1.51	3.91±1.15	4.821	**0.009**	2019-2020	0.323
							2019-2021	0.934
							2020-2021	**0.007**
	ELE-II	4.25±1.25	3.96±1.26	4.02±0.93	0.899	0.409	2019-2020	0.605
							2019-2021	0.797
							2020-2021	1.000
	PTM	4.34±0.96	4.33±0.98	4.40±0.75	0.110	0.896	2019-2020	1.000
							2019-2021	1.000
							2020-2021	1.000
	FAK-II	3.64±1.22	2.66±1.60	3.72±1.13	12.601	**0.001**	2019-2020	**0.001**
							2019-2021	1.000
							2020-2021	**0.001**
	EP	4.34±1.02	4.41±1.06	4.33±0.84	0.138	0.871	2019-2020	1.000
							2019-2021	1.000
							2020-2021	1.000
	PHARM	4.02±1.27	4.03±1.13	3.93±1.11	0.147	0.863	2019-2020	1.000
							2019-2021	1.000
							2020-2021	1.000
	PAT	4.29±0.92	4.22±1.37	3.93±1.11	1.764	0.174	2019-2020	1.000
							2019-2021	0.331
							2020-2021	0.422
3rd grade	NEUR	4.34±0.98	3.68±1.33	4.04±1.14	4.120	**0.018**	2019-2020	**0.017**
							2019-2021	0.232
							2020-2021	0.703
	OPR	4.46±0.90	3.56±1.38	3.53±1.39	9.951	**0.001**	2019-2020	**0.002**
							2019-2021	**0.001**
							2020-2021	1.000
	NPA-II	4.77±0.65	4.45±1	4.57±0.67	2.171	0.118	2019-2020	0.140
							2019-2021	0.518
							2020-2021	1.000
	PS	4.38±1.06	3.24±1.11	3.78±1.17	12.111	**0.001**	2019-2020	**0.001**
							2019-2021	**0.015**
							2020-2021	0.073

Data expressed as mean ± standard deviation. CL: On-Campus Learning Group, HE: Hybrid Education Group, OE:Online Education Group. IPO: Introduction to Physiotherapy Occupation. ANA-II: Anatomy II. HYD: Hydrotherapy. PR: Psychosocial Rehabilitation. MT-II: Manipulative Therapy II. ELE-II: Electrotherapy II. PTM: Principles of Therapeutic Movement. FAK-II: Functional Anatomy and Kinesiology II. EP: Exercise Physiology. PHARM: Principles of Pharmacology. PAT: General Pathology. NEUR: Neurologic Rehabilitation. OPR: Orthosis and Prosthesis Rehabilitation. NPA-II: Neurophysiologic Approaches II. PS: Physiotherapy in Sport

Discussion

The educational environment, materials, and methods, which were reshaped with the Covid-19 pandemic, affected the satisfaction of students' education. For this reason, in our study, we looked at three different education methods for our physiotherapy students: On-Campus Education, Hybrid Education, and Online Education (respectively, 2019, 2020, and 2021 spring semesters). For each method, we compared the students' satisfaction with the courses based on the learning outcomes.

According to our results, it is observed that the adoption of online education for the 1st-grade students did not adversely affect student satisfaction in the IPO, ANA-II, HYD, and PR courses. In the IPO course, the hybrid and online methods were even higher than the on-campus education method. We think that the reason for these results is due to the excitement experienced by students at the entrance to the profession and the younger generation more adaptable to online learning being less affected by the transition. There was no difference between on-campus and online education in the ANA-II and PR courses. Although the ANA-II course is known to be challenging for the 1st-grade students, we may be able to say that the abundance of online visual materials is effective in achieving these results. There was no difference between face-to-face and online education in the HYD course, but hybrid education was found to have the highest average. The high average in hybrid education was questioned by interviewing the lecturer of this course. The lecturer stated that the study system was the same as the other semesters, but the examination system may have caused these results. Therefore, it can be stated, from the results obtained from the 1st-grade students, that students can adapt to the online environment quickly and be satisfied with the online learning method. However, the questionnaire did not specifically ask which learning method, online vs campus education, they prefer so we don't know their preferences.

Although it is observed that there is no difference between online education and on-campus education in terms of the satisfaction of the 2nd-grade courses (PTM, ELE-II, EP, PHARM, PAT, MT-II, FAK-II), it has been found that the satisfaction of the students increased in the online education time for MT course, which includes the practical course content in the online education. We think that the effort for better processing and understanding of practical lessons in the online period increased the students' satisfaction. In the FAK-II course, it was found that student satisfaction decreased in the hybrid education period, which was the first period of the pandemic but increased in the online period without any difference from the on-campus learning period. These results can conclude that adjusting the lessons according to the online education system increased the adherence and satisfaction of the students.

The most essential factor, in the evaluation of the satisfaction outcomes for the 3rd-grade students, was the students' attitudes towards the Rehabilitation courses. During this semester, four rehabilitation courses (NEUR, OPR, PS, and NPA-II) were conducted. In these courses, it was observed that there was a significant decrease in the satisfaction of all courses with hybrid education, which was at the beginning of the pandemic. We may say that this situation is due to inadequacies in the technological infrastructure with the transition to the online system and the adaptation and anxiety problems of the students during the Covid-19 pandemic. This also brings to mind the question: Why only the 3rd-grade students? It might be because they are more experienced/comfortable with the on-campus education system being in the 3rd-grade, future anxiety, or the fact that the 3rd-grade has more clinical based (laboratory) classes. According to the OPR course results, satisfaction decreased with the transition to the hybrid period, and it was continued in the online education. However, students are more satisfied with online education in the PS course. According to these findings, it may be said that better adaptation of the course to online education, with detailed arrangements, can achieve better results in terms of students' learning outcomes. Besides, we do not believe it is not sufficient to give the OPR course with online method.

In the literature, there are many studies looking at the results of education environments related to the transition to the Covid-19 period (11,12). More specifically, studies have been questioning student satisfaction with online education, it was stated, among medical and dentistry students, that 73.5% of students were satisfied with traditional education. However, they prefer hybrid education 56% to 62.5% and 53.5% prefered online education (11). The percentages are very close to each other, which makes a person wonder if students can be a valid reference in this regard. Moreover, Totlis et al. concluded that the remote learning methods have increased the active participation of students in the anatomy lessons but had a significantly negative affect on the students' performance with exams (11). They concluded that online learning could not replace the traditional anatomy teaching method, but online lectures could be incorporated into the anatomy curriculum (11,12).

Another retrospective case-control study, by Rossettini et al., looked at students' satisfaction and performances with online learning compared with students who underwent the same course delivered face-to-face over the previous five years (4). According to the results, there was no differences between online and face-to-face teaching, concerning students' satisfaction. In contrast, with the mean performance of the same course delivered face-to-face in the previous five years, they found a statistical significance in favor of online teaching. The research concluded that online teaching for first grader bachelors students in physiotherapy seems to be a feasible option with moving to e-Learning to facilitate access to higher education.

Similarly, a cross-sectional qualitative study was conducted to explore the perspectives and recommendations to improve students' learning experience of physiotherapy during the COVID-19 pandemic. It was introduced that the findings assist programs in delivering a complete e-Learning approach as the COVID-19 pandemic continues (13,14). Moreover, the study, designed by Yılmaz İnce et al., was conducted to determine the knowledge and opinions of students about distance education during the pandemic process in Turkey (6). It was concluded that although the students had a positive view of the online lessons and the recorded lectures, they preferred face-to-face lessons instead of online. In another study, students said they learned better in the physical classroom compared to online education. However, students noted that online education is currently beneficial as professors have improved their online teaching skills since the pandemic (7).

In light of the study's results and the information found with a review of the literature, this study is the only study that investigates student satisfaction based on the learning outcomes of the courses in physiotherapy education.

As a limitation of this study, it does not include student performance evaluations.

Conclusion

The study showed that 1st-grade physiotherapy students can quickly adapt to online courses and prefer to learn with the online method. Additionally, 2nd-grade students have an increased adherence and satisfaction adjusting to the lessons according to the online education system.

On the other hand, 3rd-grade students can adapt to online lessons but prefer to learn with the on-campus education method, especially for practical courses. As a result, the courses with high theoretical content may be given online. Therefore, the online system can be integrated into the physiotherapy education system, but it cannot replace on-campus education in practical courses.

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Declarations

Ethics Approval

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of University Marmara (Date 27.01.2022/No.10)

Consent to Participate

Informed consent was obtained from all individual participants included in the study.

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Conflict of Interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

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