RESEARCH ARTICLE

Effect of COVID 19 pandemic on the academic performance of physical therapy students

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Abstract

Objective: To examine the impact of university closure and recourse to internet-based learning on the academic achievement of physical therapy students.

Method: The retrospective study was conducted at Kafrelsheikh University, Egypt, and comprised academic grades of physical therapy students related to pre-coronavirus disease-2019 pandemic academic year 2019-2020 in group 1 and per-pandemic 2020-2021 session group 2. Data was analysed using SPSS 26.

Results: Of the 8,190 students, 4,764(58.2%) were females and 3,426(41.8%) were males with age range 17-23 years who were studying at 5 academic levels. There were 3,732(45.6%) students in group 1 and 4,458(54.4%) in group 2. There were significant difference in the academic grades between the groups (p<0.005). There was greater improvement in the mean results of students' grades (p=0.001) and less variation between students in group 2 compared to group 1 (p<0.05).

Conclusion: Online learning was found to be an effective teaching method for physical therapy students during the coronavirus disease-2019 pandemic with respect to basic medical knowledge. However, its impact on clinical and practical skills of the students was not confirmed.

Keywords: COVID-19, Pandemic, Online learning, Student performance, Physical therapy.

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Introduction

In Wuhan, China, in December 2019, coronavirus disease-2019 (COVID-19) was first identified as influenza with unknown aetiology. According to the International Committee on Virus Taxonomy (ICTV), COVID-19 is caused by a novel mutant coronavirus known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).[1]

On March 12, 2020, the World Health Organisation (WHO) declared the COVID-19 outbreak a pandemic because of its fast expansion around the world.[2] Several precautions and measures were implemented to control the danger of disease transmission, including travel bans, forced travellers' quarantines, social withdrawal, ban on public meetings, closing schools and businesses, compelling individuals to work from home, self-isolation, curfews, and lockdowns.[3] All educational levels were affected by the pandemic. Around the world, educational institutions either imposed localised closures or temporary closures, affecting almost 1.7 billion students worldwide.[4]

The transition to online instruction in the given scenario was the right choice. The online learning strategy offers a way to reduce student contact and to control infection. In this period, many students struggled to access online education due to a lack of means and equipment and owing to the economic and digital divide.[5]

COVID-19 had a significant impact on healthcare students and trainees. According to a recent follow-up survey of undergraduate medical students, anxiety and stress levels rose throughout COVID-19, whereas depression remained unchanged, regardless of gender, year of study, residence, or family monthly income. Higher baseline levels of stress, anxiety and sadness, as well as poor sleep quality, were significant predictors of poor mental health.[6] The stress, anxiety and depression among students were primarily related to difficulty in concentrating, disruptions in sleeping patterns, decreased social interactions due to physical distancing, and increased concerns about academic performance.[7]

The physical therapy profession is a highly specialised practice that necessitates advanced scientific knowledge and clinical skills. Physical therapists (PTs) have developed autonomous clinical practices around the globe in the modern era, and the increased competition mandates furthering one's education in various physical therapy disciplines.[8]

The current study was planned to examine the impact of university closure and recourse to internet-based learning on the academic achievement of physical therapy students.

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Materials and Methods

The retrospective study was conducted at Kafrelsheikh University, Egypt, and comprised academic grades of physical therapy students related to pre-pandemic academic year 2019-2020 in group 1 and per-pandemic 2020-2021 session group 2. After approval from the institutional ethics committee, the grades of physical therapy students for the five levels in each academic year were collected from the Faculty of Physical Therapy. Only courses with the final assessment exam in the optical mark reading (OMR) form were included to ensure maximum objectivity (Figure). Courses of different instructors across the two academic years were excluded to ensure homogeneity.

Remark Office 2020 was used for the electronic correction of final OMR exams, resulting in a report of all grades for further analysis.

Data was analysed using SPSS 26. Data was found to be normally distributed. Unpaired t-test was used to compare the groups regarding students' grades. Coefficient of variation (CV) was calculated to determine the variation between students' grades. P<0.05 was considered statistically significant.

Results

Of the 8,190 students, 4,764(58.2%) were females and 3,426(41.8%) were males with age range 17-23 years who were studying at 5 academic levels. There were 3,732(45.6%) students in group 1 and 4,458(54.4%) in group 2.

The mean of grades for the five levels of group 1 was 77.822±4.64, while it was 82.314±3.77 for group 2. Across the 5 levels, there were significant differences in results in

Table: Students' grades across different levels.

Level	Subject	2019-2020			2020-2021				
		Valid N	Mean ±SD	C.V	Valid N	Mean ±SD	C.V	*t*-test	*p-value*
1	Ethics	1146	74.46±10.84	14.56	1269	88.91±4.36	4.903835	-43.735	0.000
	Physics	1147	71.69±9.29	12.96	1274	75.19±6.15	8.179279	-11.023	0.000
	English	1131	76.67±9.95	12.98	1275	95.35±4.61	4.834819	-60.15	0.000
	Human rights	1133	84.31±7.85	9.31	1267	90.96±4.12	4.529464	-26.38	0.000
	Disab Psych	1133	67.78±11.48	16.94	1277	73.65±10.66	14.47386	-13.016	0.000
	Total	1147	74.96±5.59	7.46	1277	84.77±3.16	3.727734	-53.887	0.000
2	Muscle test	729	79.5±6.34	7.97	1170	77.98±8.94	11.46448	4.006	0.000
	Hydrotherapy	710	72.19±8.23	11.4	1143	75.46±9.39	12.44368	-7.646	0.000
	Electrotherapy	709	75.9±7.62	10.04	1176	75.03±9.68	12.90151	2.041	0.041
	Biomechanics	730	82.73±8.12	9.82	1179	86.57±8.11	9.368141	-10.056	0.000
	Total	730	77.67±4.45	5.73	1179	78.78±5.02	6.372176	-4.882	0.000
3	Rehabilitation	627	87.27±6.07	6.96	735	84.47±6.68	7.908133	8.026	0.000
	Therapeutic	624	77.4±7.17	9.26	737	82.45±8.01	9.714979	-12.138	0.000
	Pathology3	629	89.57±6.93	7.74	727	90.74±5.77	6.358827	-3.375	0.001
	Heart Disease	628	78.57±5.78	7.36	734	88.68±5.86	6.608029	-31.936	0.000
	Radiology	625	92.1±2.82	3.06	728	90.7±4.14	4.564498	7.192	0.000
	Total	629	84.96±3.34	3.93	737	87.36±3.22	3.685897	-13.478	0.000
4	Orthosis	628	74.09±7.86	10.61	633	80.09±5.26	6.567611	-15.926	0.000
	Ortho diseases	625	78.97±8.74	11.07	636	93.5±3.88	4.149733	-38.236	0.000
	Ortho PT	627	73.99±7.61	10.29	631	81.4±6.17	7.579853	-18.995	0.000
	Trauma	624	74.86±8.44	11.27	636	77.72±8.93	11.48996	-5.849	0.000
	Trauma PT	629	75.19±6.93	9.22	629	77.53±6.97	8.990068	-5.974	0.000
	Total	629	75.39±4.97	6.59	635	82.04±3.49	4.254022	-27.57	0.000
5	Neuro Disease	595	73.08±9.21	12.6	630	67.43±6.82	10.11419	12.247	0.000
	Motor Control	595	79.54±4.98	6.26	628	79.6±3.25	4.082915	-0.25	0.802
	EMG	596	75.87±6.8	8.96	627	82.93±4.73	5.703605	-21.174	0.000
	Psyc dis	596	75.71±6.71	8.86	627	80.61±4.12	5.111028	-15.477	0.000
	Neuro rehab	594	71.06±9.07	12.76	629	82.86±8.06	9.727251	-24.094	0.000
	Neuro PT	595	81.64±6.26	7.67	628	78.55±6.94	8.835137	8.18	0.000
	Total	597	76.13±4.85	6.37	630	78.62±3.96	5.036886	-9.891	0.000
	Total	3732	77.822±4.64	5.96	4458	82.314±3.77	4.58002	-21.942	0.000

ISCO-3CPA: International standard classification of occupation-three categories of physical activity, LIPW: Low-intensity physical workload, MIPW: Moderate-intensity physical workload, HIPW: High-intensity physical workload, COVID-19: Coronavirus disease-2019, Sig: Significant.

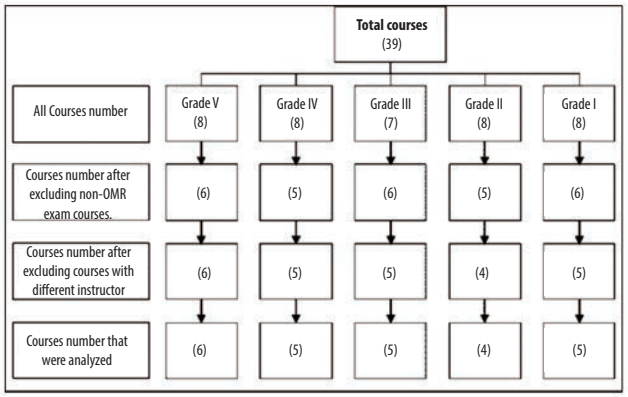

Figure: Flow chart of courses included in the study.

all subjects between the two groups ($p<0.05$) except Motor Control in level V ($p=0.802$)

Regarding the variation in student grades, the overall CV in group 1 was 5.96%, while it was 4.58% for group 2 (Table).

Based on the findings, variation in students' grades during online learning was less than the during traditional learning, which reflects that online learning was an effective method for delivering knowledge, and students were able to cope with the dramatic shift in learning strategy during the pandemic. However, this applied to only theoretical exams, and the students' hand skills were not examined in the study.

Discussion

The sudden onset of pandemic affected educational activities around the globe. Several institutions had to curtail meetings and cancel all on-campus events, including classroom instructions, to stop the virus from spreading.[9] Many institutions had the resources to do so, either with the best options and platforms or by employing readily available techniques, like mobile phones and Zoom meetings. All had to consider switching to online learning.[10]

The smartphone was the most popular device used by students to access online materials, followed by the laptop, and the personal computer (PC) was the least used tool.[5] The use of mobile devices in anatomy study among medical students in South Africa has a positive impact on the learning experience of students.[11]

The shift made by universities to online education was ambiguous due to the lack of pre-established design, planning and development of online instructional programmes. Online education is deeply rooted in adequate instruction planning and design with a variety of theories and models.[12]

The faculty should help students to understand the value of learning through blended conversations and combining online and face-to-face learning to optimise the benefits.[13] Test item analysis and field trials should consider the installation of technology solutions for testing and measurement in remote emergency education.[14]

The outcomes of the current study were consistent with studies that reported that students valued online education because it benefitted them during the pandemic.[15,16]

A similar study among physiology students also reported same findings.[17]

The outcomes reported by a study comparing mean scores before the quarantine started with the mean attained a year later indicated that the academic performance had improved in the latter exams.[18]

In Italy, a study found that online learning was a feasible option for entry-level physiotherapy students during the pandemic. However, the study stressed the need to train the lecturers to develop pedagogical skills to meet the new circumstances and to ensure a higher level of education.[19]

The current findings were in contrast to several studies which reported that during the pandemic, students experienced ineffective learning and faced various challenges in teaching and learning activities due to lack of adequate resources and well-defined procedures.[20-22]

Students presented high levels of stress, anxiety and reduced motivation to learn or study. They valued learning face-to-face rather than online as they appreciated the social support from their tutors and peers.[23]

The transition to a virtual platform was made possible through online modules and pre-recorded recordings of physicians while doing history and physical examinations on patients. A virtual curriculum also helped medical students to go over more advanced ideas. These modules and recorded films were meant to be a supplement to in-person learning in a clinical setting.[24]

In a study, most medical students preferred blended education, and even though the students' grades improved during online learning compared to the traditional method, they preferred hybrid education.[25]

To the best of our knowledge, the current study is the first to investigate the effect of COVID-19 pandemic on the academic performance of medical students in Egypt. Its strengths include a large sample size which comprised students across all levels of their academic life.

However, the current study has limitations as the sample

size was not calculated which could have influenced the power of the study. Besides, it included only physical therapy students of a single centre, and data was limited to courses with final exams in the OMR form and courses with the same instructors in both groups. Finally, the clinical skills of the students were not examined. As such the findings cannot be generalised. Further studies are needed to validate the findings.

Conclusion

Online learning was found to be an effective teaching method for physical therapy students during the COVID-19 pandemic with respect to basic medical knowledge. However, its impact on clinical and practical skills of the students was not confirmed.

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