

The Difference Between Zoom Online and Traditional Physiology Teaching in Undergraduate Physical Therapy and Biotechnology & Biological Sciences Students During COVID-19 Pandemic

Difference of
Online and
Traditional
Physiology
Teaching

Sadaf Fatima, Sulail Fatima, Sara Rafique, Sassi Kanwal, Mohammad Sultan and Abdul Aziz

ABSTRACT

Objective: To find the students' preference between zoom online and traditional face to face Physiology teaching in undergraduate physical therapy and biotechnology & biological sciences during the COVID-19 pandemic.

Study Design: Cross Sectional study

Place and Duration of Study: This study was conducted at the Sohail University from April 2021 to June 2021 for a period of 02 months.

Materials and Methods: The study participants included 100 Physical therapies and 94 Biotechnology & Biological sciences students. A questionnaire was distributed to each student. The questionnaire included 17 items regarding online and traditional teaching. The students were asked to select a response for each item on the questionnaire including the preferred teaching method from zoom online, traditional, or both. The data were presented in terms of percentage for the individual items, preference in theory, and the overall preferred teaching method.

Results: The students gave the opinion that the presence of teacher (82.1%), asking the queries to the teacher (80.2%), giving feedback to the teacher (78.3%), and interest in learning (76.4%) were more important aspects for traditional teaching. Regarding the zoom online lectures, accessibility to the internet hindered online teaching (84%) and online teaching led to more distraction (67.9%). Moreover, a high majority of students (79.2%) preferred the traditional method for theory. The overall preference for the traditional method (83%) was higher as compared to online (2.8%) and both methods (14.2%).

Conclusion: The majority of physical therapy and Biotechnology & Biological sciences students had a preference for traditional teaching methods in Physiology.

Key Words: COVID - 19, Physiology, Traditional Teaching, Online teaching

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INTRODUCTION

COVID-19 is considered a pandemic due to its severity and spread worldwide^{1, 2}. As the disease spreads through coming in contact with the affected persons, social distancing was recommended by healthcare professionals³.

Department of Physiology, Jinnah Medical and Dental College, Karachi.

Correspondence: Sadaf Fatima, Associate Professor of Physiology, Jinnah Medical and Dental College, Karachi
Contact No: 0333 2320512
Email: doctorsadafnaqvi@yahoo.com

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To control the spread of disease, lockdown restrictions were implemented all over the world⁴. During the first wave of COVID-19 pandemic, all educational institutions were closed for traditional teaching⁵. Traditional teaching methods involve direct interaction of teacher and students⁶. These methods are commonly employed in medical teaching and as well as in other programs⁷. The online teaching methods are considered as a supplementary method of teaching instead of a replacement of face-to-face teaching technique^{8, 9}. Due to lockdown for an indefinite period, the mode of teaching changed from traditional to online methods^{10, 11}.

Physiology is a basic science subject that is taught in foundation years of healthcare-related professions including physical therapy and biological sciences¹². The Physiology teaching is complex as it is based on making students understand the normal functions and mechanisms of the human body¹³. The knowledge of

Physiology learned in the initial years is required to be applied in the understanding of clinical subjects in later years¹⁴.

In 2020, after the declaration of COVID-19 as a pandemic, all educational institutions in Pakistan including medical universities were closed for traditional teaching¹⁵ from March 2020 to September 15, 2020. During this period, the Physiology teaching for biological sciences, biotechnology, and physical therapy students was shifted from traditional to online recorded lectures^{16, 17}. Both faculty and students faced many challenges in accepting this change¹⁸ but ultimately, they had to adapt as there were no chances for reopening of educational institutes for students and the lockdown period was extended¹⁰. The colleges and universities opened on 15th September 2020, after which the practical classes took place on campus and the session ended. The exams were also delayed due to another lockdown in November 2020.

In 2021, the medical universities and health care institutes opened on 1st February in Pakistan. The session started between February and March. As the COVID-19 pandemic continued, the Higher Education Commission issued a notification narrating that 50% of the students can attend classes on campus and the other 50% to take online classes. The same rule was followed by the college of rehabilitation sciences and the department of biotechnology & biological sciences at Sohail University. The online lectures were conducted on zoom^{19, 20}. The lectures were conducted in such a way that half of the class was present on campus, while the half attended these lectures live on zoom.

Several studies have been published on the challenges of online teaching in medical education, the advantages and disadvantages of online teaching, and student's perception of online teaching in general. In this study, we collected data from physical therapy, biological sciences, and biotechnology students' regarding their perception of traditional and online Physiology teaching on zoom and also about the preferred teaching method.

MATERIALS AND METHODS

The study design was cross-sectional. This study was conducted at the college of rehabilitation sciences and the department of biotechnology & biological sciences, Sohail University. The study participants were 194 undergraduate students including 100 students from physical therapy and 94 from Biotechnology and Biological sciences. The sample size was calculated from the Raosoft Sample size calculator. The sample size was calculated keeping 194 population size, 5% margin of error, 95% confidence interval, and 50% response distribution. The minimum recommended sample size was found to be 130. Out of which, 106 gave consent to participate in the study.

The duration of the study was 3 months, from April 2021 to June 2021. The study was approved by the

Ethics review board of Jinnah Medical and Dental College/Sohail University. After getting ethical approval, the participants were enrolled in the research study. Informed consent was obtained from each participant. Participants were briefed about the purpose of the study. A questionnaire was distributed to each student who gave consent to participate in the study. The questionnaires were collected and the data was analyzed.

To study the perceptions of students regarding the comparison of zoom online lectures and traditional Physiology teaching in the COVID - 19 pandemic, a questionnaire was distributed to undergraduate students studying rehabilitation sciences, biological sciences, and biotechnology. The questionnaire included 17 items from online and traditional teaching. The questionnaire used in our study was developed by Vala⁶ et al. in which evaluation of e-learning classes in medical students during the COVID-19 pandemic was studied. The questionnaire was modified. Some questions were added and some were removed. The students were asked to select a response for each item on the questionnaire. The undergraduate students provided their perceptions on online and traditional teaching. They also selected a preferred teaching method between traditional classes, online zoom classes, or both.

The data was analyzed using SPSS version 22. Descriptive statistics were used for the analysis of data. Data were expressed in terms of percentage for each item, preference in theory classes, and the overall preferred teaching method.

RESULTS

The mean age of students was 18.4± 0.5 years (male 35% & female 65%). Figure I showed the comparison of individual items 1 to 5. Figure II showed the comparison of individual items 6 to 15 based on the preference of traditional, zoom online, or both teaching methods. Fig III showed the preferred teaching mode for theory lecture and Figure IV showed the overall recommended teaching method.

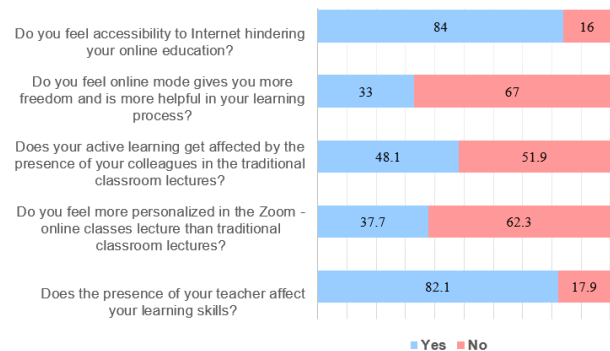


Figure No.1: The comparison of individual items 1 to 5 in physical therapy and biotechnology & biological sciences students

Figure 1 showed the individual items 1 to 5 and the percentage of these items that students selected in the form of Yes and No. In items 1 and 5, the students selecting the yes response had a higher percentage. In items, number 2, 3, and 4 most of the students selected the ‘No’ response.

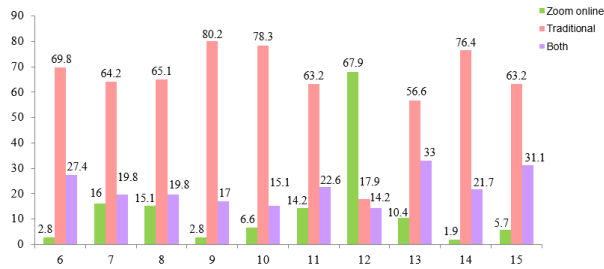


Figure No.2: The comparison of individual items based on teaching methods in physical therapy and Biotechnology & Biological sciences students

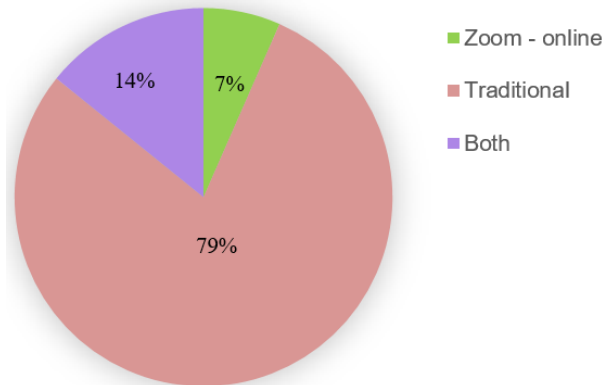


Figure No.3: The comparison of preference of teaching method in theory in physical therapy and Biotechnology & Biological sciences students

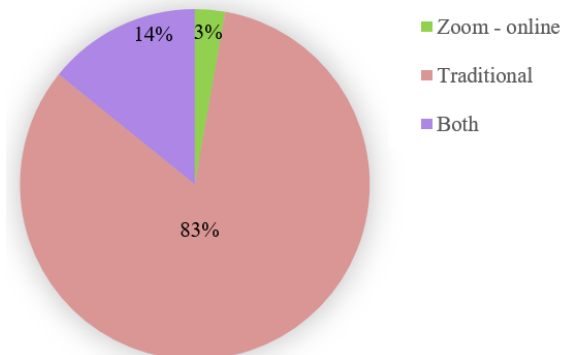


Figure No.4: The recommended teaching method in Physical therapy and Biotechnology & Biological students

In figure 2, the x-axis showed the item numbers and the y axis showed the percentage of individual items that students selected for their preferred teaching method. In most of the items in this section, the students preferred the traditional teaching method. The individual items include the importance of the presence of the teacher in class, time for understanding the lecture, asking queries

from the teacher, giving immediate feedback to the teacher, interest in learning, studying at own pace, collecting the study material, and retention of information for assessment.

Figure 3 showed the percentage of preference of teaching method for theory. The majority of students preferred the traditional teaching method.

In figure 4, the percentage of recommended teaching methods as traditional, zoom online, and both are shown. Traditional teaching method has got the highest percentage.

DISCUSSION

In this study, the perception of Biotechnology & Biological sciences and physical therapy students regarding the live online Physiology teaching and assessment in the COVID-19 pandemic was studied. In Figure, I, the majority of students selected the ‘Yes’ option for items 1 and 5. Item 1 was related to the accessibility of the internet hinders online classes. Students were in favor of the presence of a teacher for learning Physiology. Items 2 and 4 of the questionnaire were related to the online classes giving freedom and if students felt more personalized with online classes. The majority of students selected the option ‘No’ for items 2 and 4. Item 3 was regarding the presence of colleagues affecting the students learning. The response of ‘Yes’ (48.1%) and ‘No’ (51.9%) was very similar. In the majority of items our study results were different from that of Vala⁶ et al. In item 1, our students selected the option ‘Yes’ while in the study of Vala⁶ et al. majority of students selected the ‘No’ option. In items 2, 3, and 4, the majority of our students selected the response ‘No’ while the subjects in the study conducted by Vala⁶ et al. selected the ‘Yes’ response. The response of our students was similar to Vala⁶ et al. in item 5. Our study results in this section reflect that majority of students approved traditional teaching as compared to zoom online teaching. Our study finding is the same as reported by Qamar²¹ et al.

In figure II, students selected traditional teaching in items 6, 7, 8, 9, 10, 11, 13, 14, and 15. Item 6 and 7 of the questionnaire was related to concentration and motivation in learning. Item 8 was regarding the understanding of lectures. Item 9 was regarding asking the queries to the teacher and item 10 was related to giving immediate feedback to the teacher. Item 11 explored the teaching method which helped students to study at their own pace. Item 13 was related to the collection of study material. Item 14 was regarding the interest in learning and item 15 was related to retention of knowledge for assessment. The study was done by Abbasi²² et al. and Hameed²³ et al. mentioning that students did not prefer e-learning over face-to-face teaching. The study done by Hameed²³ et al. recommended blended learning for medical education in the future. The study done by Ansar²⁴ et al. reported

that students' dissatisfaction with e-learning and also identified some critical defects in the system. Item 12 was related to distraction in online classes. Baczek²⁵ et al. suggested that to conduct online teaching, a well-planned and active approach is required. In all items of this section, our study results were similar to the study performed by Vala⁶ et al. in item numbers 6,7,9,10,12, and 14. Our students preferred traditional while the participants by Vala⁶ et al study preferred online teaching mode for the item 8, 11 and 13. Iqbal²⁶ reported that E-learning considered being an alternative to traditional teaching during COVID-19 pandemic because 'something is better than nothing. Mahboob²⁷ et al. reported that student engagement in the classes and interaction in online classes was a major issue that affected the learning of students. Sanders²⁸ et al. mentioned that to conduct online classes successfully, the available technology, the experience of teachers in conducting online classes, and the instructional strategies adapted by tutors are important factors. The study done by Alves²⁹ et al. reported the internet connectivity issues were there for students attending online classes. For the teachers, excellent computer skills, good subject knowledge, and proficient delivery of lectures were required.

In figure III, our students selected the traditional teaching method for theory classes, and in figure IV; the recommended teaching method was Traditional. These findings were similar to study done by Vala⁶ et al. but the percentage of students selecting Traditional (79.2%) for theory and (83%) for the overall recommended teaching method was much higher in our study as compared to Vala⁶ et al. where students selected traditional for theory classes (40.8%) and (59%) as the overall recommended method.

CONCLUSION

The majority of physical therapy and Biotechnology & Biological sciences students preferred traditional teaching methods for Physiology teaching. To conduct zoom online sessions, faculty need to be trained and proper student engagement techniques need to be applied.

Author's Contribution:

Concept & Design of Study:	Sadaf Fatima
Drafting:	Sulail Fatima, Sara Rafique
Data Analysis:	Sassi Kanwal, Mohammad Sultan, Abdul Aziz
Revisiting Critically:	Sadaf Fatima, Sulail Fatima
Final Approval of version:	Sadaf Fatima

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Mishra L, Gupta T, Shree A. Online teaching-learning in higher education during lockdown period of COVID-19 pandemic. *Int J Educational Research Open* 2020;1.
2. Tuma F, Nassar AK, Kamel MK, Knowlton LM, Jawad NK. Students and faculty perception of distance medical education outcomes in resource-constrained system during COVID-19 pandemic A cross-sectional study *Ann Med Surg (Lond) Jan* 2021;62:377-382.
3. Lima KR, Neves BHSD, Ramires CC, Saares MDS, Martini VA, Lopes LF, et al. Student assessment of online tools to foster engagement during the COVID-19 quarantine *Advances in Physiol Educ* 2020;44 (4): 679-683
4. Dost S, Hossain A, Shehab M, Abdelwahed A, Al-Nusair L. Perceptions of medical students towards online teaching during the COVID-19 pandemic: a national cross-sectional survey of 2721 UK medical students. *BMJ Open* 2020;10(11): e042378.
5. Rajab MH, Gazal AM, Alkattan K. Challenges to Online Medical Education During the COVID-19 Pandemic *Cureus* 2020;12(7):e8966.
6. Vala NH, Vachhani MV, Sorani AM. Study of evaluation of e-learning classes among medical students during COVID-19 pandemic phase in Jamnagar city *Natl Physiol Pharm Pharmacol* 2020;10 (12):1040-1042.
7. O'Doherty D, Dromey M, Loughheed J, Hannigan A, Last J, McGrath D. Barriers and solutions to online learning in medical education - an integrative review. *BMC Med Educ* 2018; 18(1):130.
8. Yusoff MSB, Hadie SNH, Mohamad I, Draman N, Ismail MAA, Wan Abdul Rahman WF, et al. Sustainable medical teaching and learning during the COVID-19 pandemic: surviving the new normal. *Malays J Med Sci* 2020;27(3):137-142.
9. Kaur N, Dwivedi D, Arora J, Gandhi A. Study of the effectiveness of e-learning to conventional teaching in medical undergraduates amid COVID-19 pandemic *Natl J Physiol, Pharm and Pharmacol* 2020;10 (7):1-5.
10. Anwar A, Khan E, Nisar M, Qutubud Din R, Azim SR, Awan TT. Impact of COVID 19 pandemic on learning of undergraduate medical students: A cross-sectional study from Karachi. *Pak Armed Forces Med J* 2020;70(6):1902-07.
11. Ali W. Online and Remote Learning in Higher Education Institutes: A Necessity in light of COVID-19 Pandemic. *Higher Education Studies* 2020;10(3):16-25.

12. Shang F, Liu CY. Blended learning in medical physiology improves nursing students' study efficiency. *Adv Physiol Educ* 2018;42:711-717.
13. Filho FMR, Fonseca LJ, Souza VN, Guedes GD, Rabelo LA. A student-centered approach for developing active learning: the construction of physical models as a teaching tool in medical physiology. *BMC Med Educ* 2014;14:1-9.
14. Srivastava T, Waghmare L. Interactive intra-group tutorials: a modification to suit the challenges of physiology tutorial in rural medical schools. *National J Physiology, Pharmacy and Pharmacol* 2014;4(2):128-131.
15. Anwar A, Mansoor H, Faisal D, Khan HS. E-Learning amid the COVID-19 Lockdown: Standpoint of Medical and Dental Undergraduates. *Pak J Med Sci* 2021; 37(1):217-222.
16. Alsoufi A, Alsuyhili A, Msherghi A, Elhadi A, Atiyah H, Ashini A et al. Impact of the COVID-19 pandemic on medical education: Medical students' knowledge, attitudes, and practices regarding electronic learning. *PLoS One* Nov 2020; 15(11):e0242905.
17. Rapanta C, Botturi L, Goodyear P, Guàrdia L, Koole M. Online University Teaching During and After the Covid-19 Crisis: Refocusing Teacher Presence and Learning Activity. *Postdigital Science and Education* 2020; 2:923-945
18. Farooq F, Rathore FA, Mansoor SN. Challenges of Online Medical Education in Pakistan during COVID-19 Pandemic *J Coll Physicians Surg Pak* 2020; 30(Suppl): S67-S69
19. Mukhtar K, Javed K, Arooj M, Sethi A. Advantages, limitations and recommendations for online learning during COVID-19 pandemic era 2020;36(COVID19-S4): COVID19-S27-S31.
20. Sandhu P, de Wolf M. The impact of COVID-19 on the undergraduate medical curriculum, *Medical Education Online* 2020;25:1, 1764740.
21. Qamar K, Khan F, Khan MA, Raza SN, Iram M, Rauf A. Challenges of E-learning faced by medical teachers and students during COVID 19 pandemic. *Pak Armed Forces Med J* 2021;71(Suppl -1):S3-9.
22. Abbasi S, Ayoob T, Malik A, Memon ST. Perceptions of students regarding E-learning during Covid-19 at a private medical college *Pak J Med Sci* 2020;36(COVID19-S4): COVID19-S57-S61.
23. Hameed T, Husain M, Jain SK, Singh CB, Khan S. Online Medical Teaching in COVID-19 Era: Experience and Perception of Undergraduate Students. *Maedica (Bucur)* 2020;15(4):440-444.
24. Ansar F, Ali W, Khattak A, Naveed H, Zeb S. Undergraduate students' perception and satisfaction regarding online learning system amidst COVID-19 Pandemic in Pakistan. *J Ayub Med Coll Abbottabad* 2020; 32(Suppl 1)(4):S644-S650.
25. Baczek M, Zaga_nczyk-Ba_czek M, Szpringer M, Jaroszy_nski A, Wo_zakowska-Kaplon B. Students' perception of online learning during the COVID-19 pandemic: a survey study of Polish medical students. *Medicine* 2021;100:7(e24821)
26. Iqbal T. Medical students E-learning during COVID 19 lockdown *Pak J Physiol* 2020;16(1)
27. Mahboob U, Sherin A. Future of online medical education: lessons learned from the Covid-19 experience. *Khyber Med Univ J* 2020;12 (3):175-6.
28. Sanders J and Patel R. The challenge of online learning for medical education during the COVID-19 pandemic *IJME* 2020;11:169-170.
29. Alves N, Carrazoni GS, Soares CB, Rosa ACS, Soares NM, Mello-Carpes PB. Relating human physiology content to COVID-19: a strategy to keep students in touch with physiology in times of social distance due to pandemic *Adv Physiol Educ* 2021;45(1):129-133.