

Covid19 pandemic induced barriers to The acquisition of online education Among Undergraduate Dental Students OfLahore, Pakistan

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ABSTRACT

OBJECTIVE

The aim of this study was to assess the barriers to online learning faced by undergraduate dental students.

METHODOLOGY

A descriptive cross-sectional study was conducted on students of Bachelor of Dental Surgery from College of Dentistry, Sharif Medical and Dental College Lahore. A pre-validated questionnaire with a Cronbach alpha 0.94 was used.

RESULTS

All the factor scores were found to be statistically significantly different across all four years of Bachelor of Dental Surgery, instructor, and personal problems ($p \leq 0.01$), motivational and time interruption ($p = 0.003$), lack of support services ($p = 0.002$), lack of pre-requisite skills ($p = 0.006$), technical problems ($p = 0.004$) and lack of social interactions ($p = 0.008$).

CONCLUSION

The association was strong between year of study and motivational problems and time interruptions, lack of support services, lack of pre-requisite skills. The association between year of study and instructor and personal problems as well as technical problems was medium. The highest mean rank score for the barrier of instructor and personal problems, motivational problems and time interruptions, lack of support services was highest for final year students and the least for second year. The highest mean rank score for technical problems and lack of social interaction was of first year and the least for second year students.

KEYWORDS Online education, Undergraduate dental students, Barriers, COVID-19

INTRODUCTION

SARS-CoV2 infection pandemic has emerged as a major public health issue affecting people worldwide (1,2). Social distancing and infection control policy has been implemented to control the spread of disease and reduce the mortality rate with immediate closure of educational institutes (3). To overcome the challenges faced by closure of institutes all the teaching and learning activities were immediately shifted to E-learning (1,4). E-learning is defined as learning through internet using electronic media including variety of modalities such as blended learning, mobile learning, online learning and simulation-based learning (5). This step was taken to sustain the competency and academic progress of students (6).

E-learning has proven to be fruitful in this hard time of COVID pandemic with benefits of availability of study material that can be downloaded any time, access to different courses in any part of world and convenience (7). However, this immediate shift from conventional learning to E-learning has raised many queries on the quality of education (8).

One of the major challenges faced by this sudden shift to E-learning is difficulty in adaptation due to lack of expertise in operating the electronic resources and the concomitant problem of limited access to the internet, computers, and the other facilities due to social and economic setbacks (9,10). To overcome these challenge universities have begun to give online instructions and sessions to facilitate faculty members. At the same time, students are learning to access and use E- learning platforms (11).

Dental education is also adversely affected globally like all other education departments. Dental education is composed of three components: problem-based learning, laboratory skills learning, and patient based clinical skills learning. Problem based learning can be accomplished

through online lectures and live student interaction. Laboratory skills can also be learnt through online demonstrations and students practice on models. However clinical component is most adversely affected due to lack of contact with the patient (12).

There is a lack of literature available regarding the effectiveness of online teaching among dental undergraduate students of Pakistan. This will add to the body of research and help higher education authorities to implement the strategies to improve online learning in dental education. The aim of this study was to assess the barriers to online learning faced by undergraduate dental students.

METHODOLOGY

A descriptive cross-sectional study was conducted on students of Bachelor of Dental Surgery from College of Dentistry, Sharif Medical and Dental College Lahore. Dental students from all four years were included in the study irrespective of their academic record. Students who did not attend the online classes or refused to give consent were excluded from the study sample. A pre-validated questionnaire with a Cronbach alpha 0.94 was used (13). To assess the various barriers to online learning faced by the students, item analysis was performed in the pilot study on the 45 variables pertaining to barriers. The Cronbach alpha value after removing certain items in our study was calculated to be 0.934, which resulted in 35 barrier items. The Questionnaire was distributed among 200 dental students at Sharif College of Dentistry, SMDC, after obtaining permission from Sharif Medical Research Center (SMRC). Informed consent was taken prior to data collection. The underlying construct of the data was identified using principal component factor analysis on 35 items pertaining to barriers. The type of rotation used was Varimax. The value of Kaiser-Meyer-Olkin measure for sampling adequacy (MSA) was 0.880. The criteria used for identifying factors was the latent root criteria. A total of six factors were identified. The overall variance explained by these factors was 61.9%. The following factors were identified as barriers pertaining to Instructor issues and personal issues, barriers pertaining to learner's Motivation problems and time interruptions, barriers pertaining to Support service problems, barriers pertaining to prerequisite skills, barriers pertaining to technical problems, barriers pertaining to social interactions.

Recorded data was coded and entered using SPSS statistical Package version 23.0. Nominal data was presented as frequency and percentage whereas all numerical data was entered as mean and its respective standard deviation. Kruskal Wallis test was used to find the difference in the factor scores across all four years of Bachelor of Dental Surgery (BDS). Epsilon square was used to find the strength of association of the barriers to online learning and year of undergraduate dental study. P value ≤ 0.05 will be considered significant.

RESULTS

A cross sectional descriptive study was conducted on 193 students of all four years of Bachelor of Dental Surgery (BDS) of College of Dentistry, Sharif College of Dentistry, Lahore, Pakistan, out of which 31.6% were males while 67.9% were females. Majority of the students (93.3%) belonged to the age range of 18 to 24 years, 5.7% were below the age of 18 while only 1% belonged to the age range of 25 to 31 years. The difference of the factor scores across all four years of Bachelor of Dental Surgery has been shown in table 1.

Table 1 Kruskal Wallis test demonstrating the difference in factor scores across all years of Bachelor of dental surgery

Barrier to online learning	Year of study	N	Mean rank	df	Chi square (χ^2)	P value
Instructor and personal problems(factor 1)	1 st Year BDS	50	103.93	3	22.615	≤0.01
	2 nd Year BDS	50	65.62			
	3 rd Year BDS	47	104.94			
	4 th Year BDS	46	115.47			
Motivational problems and time interruptions (factor 2)	1 st Year BDS	50	105.89	3	13.747	0.003
	2 nd Year BDS	50	77.46			
	3 rd Year BDS	47	89.52			
	4 th Year BDS	46	116.22			
Lack of support services(factor 3)	1 st Year BDS	50	100.54	3	15.335	0.002
	2 nd Year BDS	50	71.50			
	3 rd Year BDS	47	105.47			
	4 th Year BDS	46	112.22			
Lack of pre-requisite skills foronline learning (factor 4)	1 st Year BDS	50	110.74	3	12.627	0.006
	2 nd Year BDS	50	73.88			
	3 rd Year BDS	47	104.63			
	4 th Year BDS	46	99.40			
Technical problems(factor 5)	1 st Year BDS	50	107.16	3	13.222	0.004
	2 nd Year BDS	50	72.46			
	3 rd Year BDS	47	105.87			
	4 th Year BDS	46	103.57			
Lack of Social interactions(factor 6)	1 st Year BDS	50	115.74	3	11.840	0.008
	2 nd Year BDS	50	77.94			
	3 rd Year BDS	47	94.64			
	4 th Year BDS	46	99.76			

To determine the strength of association of the independent variables to each of the six barrier factors, epsilon squared was calculated for each Kruskal Wallis test. Epsilon squared indicates the proportion of variance in the dependent variable that is explained by the independent variable and values of .01, .06, and .14 are by convention interpreted as small, medium, and large effect sizes, respectively. It was seen that the association was strong between year of study and motivational problems and time interruptions, lack of support services, lack of pre-requisite skills. The association between year of study and instructor and personal problems as well as technical problems was medium as shown in table 2.

Table 2: Epsilon squared values representing the strength of association between barriers of online learning and year of study

Barrier to online learning	Year of study
Instructor and personal problems(factor 1)	0.131
Motivational problems and time interruptions(factor 2)	0.80
Lack of support services(factor 3)	0.76
Lack of pre-requisite skills for online learning (factor 4)	0.75
Technical problems (factor 5)	0.063
Lack of Social interactions(factor 6)	0.053

DISCUSSION

COVID 19 pandemic caused a huge shift in the mode of instruction from campus based to online teaching, in order to assure the safety of the teachers and the students and to minimize the impact of the pandemic on the system of education^(14,15).

According to our study, the highest mean rank score for the barrier of instructor and personal problems was for final year students (115.47) followed by third year (104.94), first year (103.93) and lastly second year (65.62). The instructors play a pivotal role in the academic success of the students and they should make an effort to understand the requirements and problems of the students during online teaching and learning⁽¹⁶⁾. Many problems faced by students due to personal problems can be attributed to domestic violence and disputes, fulfilling the role of prime care giver and tending to ill family members⁽¹⁷⁾. A study conducted on polish medical students, it was seen that the greatest barrier and disadvantage to online learning reported by students from first to third year was technical problems (59%), followed by lack of self-discipline (49%), reduced interaction with the teachers (47%), social isolation (44%) and poor learning conditions at home (18%)⁽¹⁸⁾.

Our study reported that the highest mean rank score for motivational problems and time interruptions was that of the final year students (116.22) followed by first year students (105.89), third year students (89.52) and second year (77.46). According to the study cited above⁽¹⁸⁾, among the students of fourth to sixth year, it was seen that the biggest problems faced by students were technical problems (49%) followed by reduced interaction with the teachers (43%), social isolation (35%), lack of self-discipline (32%) and poor learning environment at home (13%)⁽¹⁸⁾.

It was seen in our study that the highest mean rank score for the lack of support services as a barrier to online learning was of final year students (112.22) followed by third year (105.47), first year students (100.54) and second year (71.50). Beticulon et al. in a study conducted in 2021 on barriers to online education in Philipines, reported that majority of the students (32%) reported a discomfort with adopting the learning styles online. This was followed by the burden of household chores by 31% of the students, followed by a lack of an appropriate space for studying at home (28%), lack of communication with the instructors (24%), limited internet availability and accessibility (22%), deteriorating mental health (21%) technical problems (8%) and part time jobs (6%)⁽¹⁷⁾. Our study reported that the highest mean score for technical problems was of first year (107.16) followed by third year (105.87), final year students (103.57) and second year students (72.46). The highest mean rank score for lack of social interaction as a barrier to online learning was that of first year (115.74) followed by final year (99.76), third year students (94.64) and second year (77.94). The technical problems can be attributed to the high cost internet services as well as in the time of this pandemic a vast majority of individuals faced financial problems and had to choose between the absolutely necessities and luxuries of life⁽¹⁷⁾.

CONCLUSION

It was seen that the association was strong between year of study and motivational problems and time interruptions, lack of support services, lack of pre-requisite skills. The association between year of study and instructor and personal problems as well as technical problems was medium. The highest mean rank score for the barrier of instructor and personal problems was for final year students and the least for second year. In case of motivational problems and time interruptions highest mean rank score for was that of the final year students and least for second year. The highest mean rank score for the lack of support services as a barrier to online learning was of final year students and the least for second year. The highest mean rank score for technical problems was of first year and the least for second year students. The highest mean rank score for lack of social interaction as a barrier to online learning was that of first year and the least for second year.

LIMITATION

A larger sample size would have helped us unravel more findings.

RECOMMENDATIONS

There is a dire need to reform the system of online education. The various barriers to online learning experienced by students should be addressed and the online teaching and learning should be designed in a way to facilitate both the teachers and students.

CONFLICT OF INTEREST

None

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