

Analysis of the E-Learning Educational Atmosphere During Covid 19 Pandemic: Empirical Evidence from Medical Universities of Urban Pakistan

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ABSTRACT

Objective: To analyze the level of satisfaction of medical students towards the existing e-learning educational environment and to determine its effectiveness enhancing learning outcomes.

Study Design: Descriptive Cross-sectional study

Place and Duration of Study: This study was conducted at the Online survey was conducted using google forms to collect data from MBBS and BDS students enrolled in various public medical universities of Karachi and who have attended online classes during COVID-19 pandemic from April to September 2020.

Materials and Methods: Structured questionnaire using a 5-point Likert scale was adopted for the study with reliable Cronbach's alpha coefficient (0.85). Non-probability purposive sampling technique was used for selecting the participants. The study was approved by the Institutional Review Board of Dow University of Health Sciences.

Results: Significant p-value concluded that medical students are generally satisfied with e-learning educational atmosphere during COVID-19 pandemic in Pakistan. According to the survey, students of First and Second Professional year were highly satisfied (83%) with the e-learning atmosphere, whereas students of Third and Fourth year had mixed opinion. However, 60% of final year students were dissatisfied with the existing e-learning educational atmosphere.

Conclusion: The survey revealed positive attitude of medical students towards e-learning. However, clinical exposure of students is compromised which is a major challenge. Depending on the requirement of specific courses, adopting a hybrid approach involving some combination of e-learning and practical exposure seems more effective.

Key Words: Medical education, e-learning, COVID-19, distance learning, universities, higher education

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INTRODUCTION

The rapidly spreading COVID-19 pandemic has attributed several changes not only on the lives of a common man but it has impacted the whole world. The novel Corona virus (COVID-19) emerged as a fatal lower respiratory tract infection in China in December 2019 and in no time i.e. March 2020, it was declared a pandemic by World Health Organization. Pakistan, as one of the developing countries, was also seriously impacted by the fatal infection¹⁻⁴.

Imports, exports, businesses, hospitals, schools, universities, all just came to a halt.

The education sector of Pakistan is also seriously affected by the pandemic; worth to mention that public sector medical universities have severely suffered as not only they lack the required resources but the nature of the study mandates practical exposure. This emerged as a humungous challenge for medical institutions of Pakistan. The situation was not only novel but it was accompanied by lot of uncertainties. Online sessions were somehow conducted without any prior experience or training but the practical exposure of medical students was completely halted. The universities weren't prepared to handle this challenge and there was significant reluctance among students and faculty to adopt e-learning strategy. Though e-learning is already in practice in developed countries where studies have been done on its readiness and effectiveness. They are of the view that e-learning is a useful supplement to conventional lecture-based teaching even for the medical curriculum⁵⁻⁹. Most medical schools around the globe have rapidly transformed their curricula from traditional face to face learning to online system of

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teaching recently¹⁰⁻¹¹. But this educational transition is a challenge for developing countries like Pakistan. E-learning is gaining a lot of attention in Pakistan with respect to its integration into educational system along with significant increase in the usage of cell phone and tablets in Pakistan¹². The major factors which hinder the adoption of e-learning include non-availability of proper technological infrastructure, restricted financial resources, limited assessment approaches and lack of required pedagogical skills required for teachers to deliver the content electronically¹³. The advantages of e-learning include low delivery cost (including web server cost and technical support) than those for classroom equipment with additional plus point of saving teacher's and student's travel time. Other advantages include ease of access and flexibility, portability, improved student teacher contact and increased discussion with peers. The disadvantages include feeling of isolation, being unable to clarify doubts with a tutor and lack of in depth group discussions⁷. Keeping in view the numerous advantages of e-learning, all possible efforts should be directed toward making e-learning meaningful and effective, both at institutional and governmental level which would surely enhance students' learning and skills.

One of the most important determinants of successful and effective e-learning educational atmosphere is to analyze the level of student satisfaction with the system¹⁴. The pandemic has forced a shift from face to face classroom lectures, practical and tutorials to challenging digital mode of learning¹⁵. Medical students are getting no exposure to clinical side and hence, nil bed side experience causing inimical effects on their exam performance. It is a serious legitimate concern of medical education providers and students who are in the process of correlating subjective knowledge with clinical skills.

COVID 19 has made e-learning a new normal for the academia, it is crucial to take necessary steps to ensure uninterrupted and optimal learning of medical students in a congenial learning environment. Medical students are objectively trained to be educated physicians having broad knowledge of science and are equipped with the proper understanding of laboratory methods and practical knowledge of bedside medicine. But, unfortunately, the global COVID emergency has brutally disrupted the objectives of the professional medical education putting medical students at stake. Therefore, the current bewildered situation demands prompt attention and effective steps to be taken by the authorities to design the principles of digital learning keeping in view students' attention and motivation. It is the dire need of time to implement e-learning for all the medical universities and colleges, but it's equally important to continuously assess and evaluate this new online teaching system to timely diagnose the loop holes of the system making it efficient. It is the high

time to assess their satisfaction towards this virtual system of medical education in order to improve their learning to keep pace with the advancing field of medicine. The main aim of the survey is to critically assess the level of satisfaction of medical students while going through e-learning educational atmosphere during COVID 19 pandemic and to determine its effectiveness so that timely measures could be taken to improve student's knowledge, learning and to keep them motivated in these unprecedented times. The survey could also identify deficiencies in the system timely and help us to keep pace with global changes in knowledge acquisition and management. It will also provide the investors and policy makers with useful information in creation of some lasting education policy to vanquish the challenges faced by the students during the times of such inevitable situation or even when they are at home for their normal semester break or during a pandemic.

MATERIALS AND METHODS

This descriptive survey included students of MBBS and BDS (n=400) studying in various public sector medical universities and colleges of Karachi registered with Pakistan Medical Commission (PMC) who are taking online classes of different medical subjects on Zoom, Google classrooms or any other e-learning platforms during the COVID-19 pandemic.

The sample size was determined using estimation technique. The sample size is 384 at 95% confidence interval and $\pm 5\%$ margin of error¹⁶⁻¹⁷. Sekaran (2005) and Zikmund (2013) also suggest a sample size of 384 when the unit of analysis is an individual. Hence, the sample size for the questionnaire survey was 400 [18].

An online questionnaire survey was conducted using google forms to collect the data from the respondents since the outbreak and lockdown in the city did not allow physical contact. Particularly, online survey was conducted for data collection to comply with the social distancing policy outlined by World Health Organization (WHO) and the government of Pakistan for limiting the spread of corona virus. The scale was adopted from a previous study conducted on the participants of master programs of 'E-Learning Planning', 'Medical Education', 'Educational Technology', and 'Family Medicine Management'¹⁹. Considering the contextual requirements, it was further validated by the field experts. The questionnaire was administered by sharing link of google form via email, WhatsApp, Facebook and other social media platforms to get the responses from the target group. The purpose of the study was clearly explained to the participants and confidentiality of the data was assured. A five point Likert scale ranging from "Strongly disagree" (SD), "Disagree" (D), "Neutral" (N), "Agree" (A) to "Strongly agree" (SA) was used to measure the level of agreement or disagreement of respondents to a given

statement. It is one of the most widely used techniques for descriptive studies to collect data from large sample, less time consuming, easy to compute and analyze findings and easily understandable for the respondents²⁰⁻²¹.

Reliability statistics was assessed using Cronbach alpha (0.852). A coefficient value of 0.7 and above is considered good^{18,21}. Further, all items in the scale also had reliability above 0.8 indicating a good reliable scale as shown in Table 1. T-test was performed for hypothesis testing. Correlations and cross tabulation were also performed to see the difference.

RESULTS

Four hundred (n=400) students of MBBS (88%) and BDS (12%) studying in registered public sector medical

universities and colleges of Karachi registered with Pakistan Medical Commission (PMC) responded to online survey. All students (72% females and 28% males) were taking online classes during COVID pandemic. The data shows that not only vast majority of females are studying in public sector medical colleges and universities of Karachi but are also actively participating in e-learning as well.

The analysis of the survey revealed that Zoom is the most popular tool used for e-learning in comparison to google classroom (27%) and other tools (2%). Furthermore, it was found that 67% students were enrolled in First Professional year, 21.8% in Second Professional, 4.5% in Third Professional, 1.8% in Fourth Professional and, 5% were enrolled in Final professional year.

Table No.1: Statistical Item Analysis of the Questionnaire Survey On Satisfaction Level of Medical Students with E-Learning Educational Atmosphere During Covid-19

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q1	33.00	50.877	0.676	0.548	0.830
Q2	33.09	52.521	0.576	0.361	0.837
Q3	33.14	53.786	0.550	0.370	0.839
Q4	33.67	53.009	0.574	0.443	0.838
Q5	32.99	54.033	0.463	0.294	0.844
Q6	33.20	50.685	0.645	0.543	0.832
Q7	34.13	59.338	0.096	0.148	0.867
Q8	33.07	51.815	0.588	0.753	0.836
Q9	33.07	51.010	0.641	0.779	0.832
Q10	32.88	54.181	0.473	0.375	0.844
Q11	32.70	53.645	0.575	0.444	0.838
Q12	33.99	55.719	0.335	0.260	0.853
Q13	33.13	53.415	0.468	0.262	0.844

Table 2: One Sample T-Test

	Test Value = 2					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
E-learning Atmosphere	25.428	399	.000	.76942	.7099	.8289

t(399) = 25.428, p-value .000

As per results indicated in Graph 1, students of First and Second Professional year seem highly satisfied with the e-learning atmosphere whereas students of Third and Fourth Professional year seems to have mixed opinion as shown in Graph 1. As for students of Final professional year, 60% of the students were dissatisfied with the existing e-learning atmosphere according to the findings of this study. This indicates that early year medical students are satisfied and motivated by this E-learning environment but

dissatisfaction of the students after that period is possibly due to obtrusion of clinical training and bedside exposure that is usually practiced from third professional year onwards.



Figure No.1: Crosstab Analyzing Satisfaction Level in Medical Professional Years During Covid-19

It is also observed that majority of the medical students (n=349) attended online classes from urban areas while a smaller number of students participated from urban areas (n=25) and outside Pakistan (n=26). According to the results of t-test indicated in Table 2, significant p-value concludes that medical students are satisfied with e-learning implemented because of the pandemic.

DISCUSSION

The COVID-19 pandemic has pushed academic institutions around the globe to create a digital learning environment yet poised a big and unique global challenge for academia peculiarly medical colleges and universities. The study findings would help stake holders to accordingly take timely measures creating a conducive e-learning atmosphere for the medical students. Overall, majority of the students showed a positive attitude towards the e-learning and were satisfied with online teaching strategy currently adopted. The findings are similar to a previous study conducted on medical students of Iran who strongly agreed the effective role of e-learning in medical education⁶. They agreed with the view e-learning enhances their learning. The most cited advantage of e-learning is the learning delivery as updating electronic content is easier and faster than updating textbooks²². Though an acceptable level of satisfaction was found among medical students but their motivation for distance e-learning is at a bit lower scale which can be correlated to their internet self-efficacy⁵.

According to survey, the first and second professional year students are highly satisfied while final year students are dissatisfied with e-learning atmosphere. The reason being their clinical training and patient exposure is adversely affected by this pandemic. These trainings range from clinical practice and ward rounds to on-the-job training in diagnostic skills and inter professional communication.

The limitation of the study was access to medical students due to pandemic. Since study was conducted on medical students of public sector universities of Karachi, results cannot be generalized to the students of private medical institutions or public medical universities in other cities of Pakistan.

Since COVID19 pandemic has created a unique digital learning environment, there is scarcity of published empirical studies regarding satisfaction of medical students towards e-learning atmosphere in higher educational institutions and its effectiveness specially in a developing country like Pakistan. Hence, the current study is unique in this aspect. There is a dire need to conduct further research in this area to enhance the understanding of dynamics of e-learning atmosphere for medical institutions in Pakistan.

CONCLUSION

The survey concluded satisfaction of medical students towards e-learning environment. It suggested that depending on the requirement of specific courses and professional year of education, adopting a hybrid approach involving some combination of e-learning as well as practical exposure seems more feasible for effectively imparting medical education.

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