Original Article

Perception of Medical Students Toward the Impact of Online Education on their Academic Performance and Emotional Wellbeing

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ABSTRACT

Introduction: Online education was used to some extent in all fields before COVID 19 pandemic. Its use has markedly increased during the pandemic with a major shift was from traditional teaching methods to online and hybrid teaching. Due to advancements in medicine and technology, the use of E-learning and artificial intelligence in health education is compulsory. Online education will be a part and parcel of future medical graduates in terms of electronic health records, telemedicine, and aided diagnosis systems.

Objective: This study aims to determine the perception of medical students toward the impact of online education on their academic performance and emotional well-being.

Methods: A 31-item questionnaire was devised on google Forms and disseminated through WhatsApp groups of the fourth year and final-year MBBS students of Allama Iqbal Medical College. The survey was administered from April 4th, 2023, to April 30th, 2023. The questionnaire comprised of mixed-style questions. The medical students were asked about their perceptions of online education and its impact on academic performance and emotional well-being.

Results: More than 50 percent of students gave a positive impact of online education on their academic performance but it negatively affects their practical skills. Many students experienced anxiety, stress, and difficulty in focusing during online education. Internet quality and speed were the main challenges faced by most of the students. A significant difference is observed due to student status and residential status on their academic performance and emotional well-being.

Conclusion: Students have positive perceptions of their academic performance in terms of formative and summative assessment scores but experience negative effects on their practical skills. It is associated with various degrees of emotional disturbances including stress, anxiety, less motivation, and attention deficit.

Keywords: Online Education, Academic Performance, Emotional Wellbeing

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INTRODUCTION

Online education has been used in all fields of education worldwide for the last two decades to various extents. Its use was considerably enhanced during covid 19 pandemic including medical education (Owston et al., 2013). It was a global emergency that resulted in a major shift in methods of knowledge transfer. Initially, there was a shutdown of all teaching and learning activities, particularly in developing countries, followed by online education, which comes as a game changer and saves the educational system from collapse (Mortagy et al., 2022).

As it started as an emergency measure, many underdeveloped countries including Pakistan were deficient in basic infrastructures, faculty training, and technological skills. Online education was used only as a compilation of traditional curriculum rather than an integrated curriculum that was set according to the need of the time and students. There are many challenges to online education including time management, the use of technology tools, interaction with peers and teachers and the effectiveness of teaching strategies (Rajab et al., 2020).

Like E-learning , artificial intelligence has revolutionized the world, including medical education(Nimavat et al., 2021).

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Email address: shamila.yasir@gmail.com Affiliation: Allama Iqbal Medical College, Lahore, Pakistan Received: June 15, 2023 Revised: August 19, 2023 Accepted: September 28, 2023 Available online: December 27, 2023 The digital information era poses different types of challenges even for digital native learners, so teaching methods need to be changed to meet these challenges (Pei and Wu, 2019).

Online education, an important part of the working of future doctors in terms of electronic health records, tele medicine and aided diagnosis systems. It is compulsory to determine the effectiveness of online medical education and its impact on emotional wellbeing of medical students. Most of the literature available is about the benefits of online education and less is available about its impact on its effectiveness and emotional wellbeing through student's lens (Wang and Torrisi-Steele, 1 C.E.).

Our aim is to student's perception on the effectiveness of the online education system on their academic performance and emotional wellbeing. This research can help the stakeholders to make informed decisions about the integration of online education in health education and provide necessary support to the students. It may need curriculum revision, online formative assessment towards hybrid system, use of artificial intelligence in provision of E library that contains online lecture banks for different topics in each specialty and short quiz as a tool for formative assessment and after attaining sufficient degree of reliability and validity can use for summative assessment.

METHODS

This was a cross sectional observational study carried out in Allama Iqbal Medical college, Lahore. Online education was conducted through Zoom learning management system mostly. A 31-item questionnaire was devised based on published literature and a study conducted in Egypt recently that addressed the same topic after taking permission from the author on email. DREEM, a validated tool to measure educational environment is also consulted. The questionnaire includes student's experiences of online medical education, its impact on their academic performance and emotional wellbeing.

The questionnaire comprised blends of question styles including closed ended, multiple choice, checklist choice and 5-point Likert scale type questions (ranged from strongly disagree to strongly agree). After initial drafting, the questionnaire is was discussed with medical educationist and pilot with sample of medical students followed by final draft. After approval of institutional review board (IRB), this questionnaire was disseminated as Google forms on WhatsApp groups of 4th year and final year students of MBBS. This group was made to disperse information of all academic activities to the students. The survey was carried out from April 4th, 2023, to April 30th, 2023.

All students in one or more than one online medical education activity was included in the study. Students with diagnosed psychiatric disorder were excluded from this study. Consent to take part in the survey was included in the questionnaire. It included two sections. Students who were consenting to be part of the survey would be able to fill in the second section of the form. Data was collected anonymously with no identifiable information and was analyzed by SPSS version 20.

RESULTS

A total of 238 students of 4th year and final year MBBS of Allama Iqbal medical college Lahore participated in the survey. Out of these 45.8% (109) were male and 54.2% (129) were female students. Among the participants 64.3% (153) were and 35.7% (85) were day scholars. The sociodemographic details are demonstrated in table 1.

Table 1: Socio demographic details and online management system	m
information	

Variables n= 238		Frequency	Percentages				
Age: Mean =22.7 SD= .964, Min= 21.00, Max= 24.00							
Carla	Male	109	45.8%				
Gender	Female	129	54.2%				
Student status	Day scholar	85	35.7%				
Student status	Boarder	153	64.3%				
Decidential Status	Rural	52	21.8%				
Residential Status	Urban	186	78.2%				
Class of respondents	4th year	66	27.7%				
Class of respondents	Final year	172	72.3%				
Online learning management system	Don't know	15	6.3%				
already present in your college before	No	149	62.6%				
COVID?	Yes	74	31.1%				
	<3 months	16	6.7%				
How long did you attend online	>1 year	50	21.0%				
classes?	>6 months	70	29.4%				
	3 to 6 months	102	42.9%				

	Zoom	203	85.3%
	Google class room	22	9.2%
Which online tool was used for	Microsoft teams		
teaching?	/ FCC / Free	13	5.5%
	Conference		
Attendance mandatory for those	No	14	5.9%
sessions?	Yes	224	94.1%
Were you aware of usage of technol-	No	35	14.7%
ogy or online teaching platforms at	To some extent	62	26.1%
that time?	Yes	141	59.2%
Were there any internet quality/speed	No	45	18.9%
	Rarely	38	16.0%
issues that you face?	Yes	155	65.1%
Online teaching sessions consist of	Asynchronous	11	4.6%
synchronous(live lectures that you	Both	33	13.9%
can attend only at that time) or Asyn-	Don't know	1	0.4%
chronous(pre-recorded lectures you	Synchronous	193	81.1%
can take them at any time)lectures?			

More than two thirds of students, 78.15% (186) lived in urban areas while 21.85% (52) belonged to rural areas (Figure 1).



Most of the responses received 72.27% (172) from the final year students and 27.73% (66) from the 4th year students (Figure 2).



62.6% (149) students believed that Learning Management system did not already exist in their institute at the time of pandemic while 31.1% (74) and 6.3% (15) said LMS was present and may be present respectively. Academic performance and emotional wellbeing score statistics depicted in table 2.

Statistics							
		Academic Performance Score	Emotional Wellbeing Score				
N	Valid	238	238				
N	Missing	0	0				
Mea	n	29.3824	21.3613				
Std.	Deviation	6.18635	3.33307				
Min	imum	13.00	11.00				
Max	imum	45.00	35.00				

Duration of online classes were 3 to 6 months by 42.7% (99), >6 months by 29.7% (69), >1 year by 20.7% (48) and <3 months by 6.9% (16) students. Zoom was used 86.6% (201) as online tool for online education. Rarely used tools were google classroom 8.2% (19), Moodle, Socrative and microsoft teams. Most of the sessions were synchronous 81% (188), few sessions were of Asynchronous learning 4.7% (11) and both 13.8% (32) respectively. Attendance was mandatory 94% (218) in most of the sessions. A good number of students, 59.6% (137) were aware of the use of technology while 27% (62) and 13.5% (31) were aware to some extent and not aware of the technology respectively.

Internet quality and speed was the main challenge faced by the students 64.2% (149). Table 3 showed Cross tabulation of academic performance and emotional well being with gender, residential status, and class of respondents.

Table 3: Cross tabulation of academic and emotional well-being with
gender, residential, student status, and class of respondents

Mean		Academic Perfor- mance Score		Emotional Wellbeing Score				
		SD	P value	Mean	SD	P value		
Candar	Male	29.18	6.28	640	21.05	3.54	180	
Gender	Female	29.55	6.12	.049	21.63	3.14	.100	
Student	Day scholar	28.36	6.00	.050	20.92	2.80	.126	
Status	Hostellite	29.95	6.24		21.61	3.58		
Residential	Rural	31.37	5.21	000	21.87	3.53	210	
Status	Urban	28.83	6.34	.009	21.22	3.27	.219	
Class of re- spondents	4th year	30.05	4.98	207	21.02	3.55	222	
	Final year	29.13	6.59	.307	21.49	3.25	.322	

Regarding satisfaction with their performance 46% (109) were satisfied while 28.3% (67) were not sure and 25.8% (61) were not satisfied. Most of the students 44.3% (105) were of the view that online education made them stay motivated and focused while 22.8% (54) were neutral and 32.9% (78) disagreed. 39% (92) wanted to continue asynchronous type online education in the future while 25.8% (61) were not convinced and 35.2% (83) were not in favor of asynchronous lectures. Regarding their perception of the online education experience. Most of the

students reported it fair 49.8% (118), 28.3% (67) rated it good, 6.3% (15) and 15.6% (37) rated it excellent and poor respectively (Table 4).

Table 4: Expe	erience of res	pondents du	ring online	teaching

	Experience							Chie		
	Excellent		Fair	Fair		Good		Poor		square P value
	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
Gender	Male	9	60.0%	53	44.9%	27	40.3%	20	52.6%	.426
Gender	Female	6	40.0%	65	55.1%	40	59.7%	18	47.4%	
Student status	Day scholar	8	53.3%	38	32.2%	28	41.8%	11	28.9%	.213
	Hostel- lite	7	46.7%	80	67.8%	39	58.2%	27	71.1%	
Resi- dential Status	Rural	1	6.7%	27	22.9%	9	13.4%	15	39.5%	.008
	Urban	14	93.3%	91	77.1%	58	86.6%	23	60.5%	
Class of respon- dents	4th year	4	26.7%	36	30.5%	20	29.9%	6	15.8%	
	Final year	11	73.3%	82	69.5%	47	70.1%	32	84.2%	.345

DISCUSSION

The COVID 19 pandemic was a global emergency and like many underdeveloped countries, we are not well trained and well equipped in means of infrastructure, faculty training, resources and students' readiness and sensitization (Wasfy et al., 2021). Different factors can influence students readiness to online education that ultimately impact their perceptions of online teaching (Wei and Chou, 2020). Despite the above challenges, the institute not only developed a learning management system but used it to prevent academic loss of our students.

The mean age of the students was 22.7 as mostly responses were received from the final year students. It may be because the author's specialty is the major subject of final year MBBS due to which students were more receptive and punctual in class and showed interest in the survey. More females students attempted questionnaire than male students because student's enrollment in public sector medical colleges is on open merit and females occupied significantly more seats than male peers. Although Literature shows a significant association between the gender, residential area, and previous experience of online teaching, there is no difference in perception between male and female students (Bolatov et al., n.d.).

As many students were hostelite, probably they used online education at home along with their families rather than staying in the hostel during pandemic. There is significant impact on academic performance of hostellite as compared to the day scholar students. They might experience it in more depth in comparison to the day scholar's students who were already at homes. Similarly due to the facility of the asynchronous lecture's students can study at their own pace and can revisit the recorded lectures to check summary for revision purpose (Mukhtar et al., 2020). It could be more convenient, cost effective, contented and safe for them.

Most of the students resided in urban areas and fewer were from rural and semi urban districts. There is significant variation between students from urban to rural areas. It is understood that the rural areas have poor internet quality and lack of facilities. Despite major chunk of respondents from urban areas, internet quality/speed is the major challenge faced by the students. This issue is observed in local as well as international studies. Students and faculty face this issue in all domains of teaching and learning so, should be taken into consideration to resolve. For this purpose, it is suggested that medical colleges and universities should invest in high quality software to resolve faculty internet problems (Jiang et al., 2020). Institutions should also come forward to provide necessary assistance and support to the students in smooth running of online education (Iftikhar and Cheema, 2022). The learning management system did not exist at the start of pandemic in the institute, but some of students had perception that it was present in its preliminary form. This perception could be due to already existing WhatsApp groups, created to disperse guidelines and to circulate teaching schedules.

Many of the participants attended online classes for at least 6 months while others for less than 3 months. Multiple factors could be considered for their short duration of online education. Students with positive attitude towards internet use are more prone towards online lectures and seems more satisfied(Wei and Chou, 2020). It includes internet availability and quality issues, technophobia, lack of continuity, failure to handle stress and anxiety, and lack of gadgets for online education. Zooming was the major tool and synchronous type of online education was used purely as institutional choice while some teachers used other tools like google classrooms, Socrative and Microsoft teams as per their convenience.

Many students find online education as effective as face-toface educational activity in our study. More than 60 percent of students agree that online education clears their concept in the same way as traditional physical teaching. While 20 percent were neutral, we can't disregard them as well because they might not be able to decide now. Our findings are contrary to an Egyptian study in which online education was not found as effective as face to face teaching (Mortagy et al., 2022). Kaini and Motie suggested that despite some disadvantages of online education it remains effective in terms of learning during this emergency conditions (Kaini and Motie, 2021).

Impact of online education on academic performance: Regarding Impact of online education on their academic performance, we got mixed response in terms of effective learning, scores in formative and summative assessments, satisfaction from their performance and continuation of online education in future. Approximately equal numbers of respondents indicated that their scores remain the same, lower, or higher than the expected score. Although many students seemed satisfied with learning and academic scores, they agreed that it had a negative impact on their practical skills (Javed et al., 2023) Contrary to other educational courses, bedside teaching, face to face interaction with patients, procedural skills, development of psychomotor and affective domain is unique to medical education. There are certain barriers in acquisition of procedural and psychomotor skills during online education and students find it lacking but still students believe that online education should continue to some extent after the pandemic so that students, faculty, learning management system and institutes remains functional and can use advanced technology during such emergency situations in future (Alsoufi et al., 2020). Many reasons can explain these barriers including rapid transition from traditional to online educational strategy, faculty training, non-availability of infrastructure, desired modification and alignment in curriculum and financial resources (Elshami et al., 2021). A Malaysian study showed, students found themselves less competent as compared to the previous batches due to insufficient clinical rotations but it can be managed by using different online strategies like use of video communication for history taking and videotaping of physical examination, asynchronous lectures and use of summaries of important clinical cases before the start of synchronous live sessions (Lah Nik-Ahmad-Zuky et al., 2020).

Impact of online education on mental wellbeing many students felt stress, anxiety, attention deficit symptoms, sleep disturbances and social isolation during online sessions. No significant relation was found on bases of gender, students' status, residential status, and year of studies, similar to study conducted at Jordan. These results could be due to lack of experience of online education, technological barriers, failure to cope with online resources which leads to more time consumption and results in poor emotional wellbeing (Muflih et al., 2021). Another study at Kazakhstan shows an improvement in mental health in online learning as compared to traditional learning. During the quarantine period after transitioning from traditional learning to online learning mental health condition of the students improved(Bolatov et al., n.d.). Online educational experience: Overall, most of the students rated online education experience as good. No significant relation was found based on gender, student status and class of respondents. It's been observed that urban students are more satisfied with online education as compared to rural area residents. It might be due to the availability of high-quality internet with fewer challenges along with more opportunities of advanced technology as compared to rural residents resulting better time management. Government should take steps to enhance availability of 4G and introduce 5G technology as well ,to overcome the limitations of online education(Mukhtar et al., 2020).

CONCLUSION

Online education is used on emergency basis in COVID 19 pandemic with positive response from students in terms of academic performance, satisfaction, and experience of online education but it showed various degrees of emotional disturbances including stress, anxiety, failure to concentrate and lack of motivation. Online education emerges as an effective teaching tool but has some limitations and disadvantages.

LIMITATIONS

It's a single centered study and findings are only applicable to the similar context. For generalizability, a survey on a larger scale is recommended.

RECOMMENDATIONS

Online education should be continued as hybrid model in our medical institutes. Faculty training and curricular reforms for

online education can be adopted to improve the outcomes. E library, asynchronous lectures, and formative assessments could be used as pilot project to keep online education integrated in our system.

DECLARATION OF INTEREST

The authors declare no conflict of interest.

REFERENCES

Alsoufi, A., Alsuyihili, A., Msherghi, A., Elhadi, A., Atiyah, H., Ashini, A., Ashwieb, A., Ghula, M., Ben Hasan, H., Abudabuos, S., Alameen, H., Abokhdhir, T., Anaiba, M., Nagib, T., Shuwayyah, A., Benothman, R., Arrefae, G., Alkhwayildi, A., Alhadi, a., Elhadi, M. (2020). Impact of the COVID-19 pandemic on medical education: Medical students' knowledge, attitudes, and practices regarding electronic learning. PLoS ONE, 15(11 November). https://doi.org/10.1371/Journal pone.0242905

Bolatov, A. K., Seisembekov, T. Z., Zh Askarova, A., Baikanova, R. K., Smailova, D. S., and Fabbro, E. (n.d.). Online-Learning due to COVID-19 Improved Mental Health Among Medical Students. https://doi.org/10.1007/s40670-020-01165-y/Published

Cavus, N., Mohammed, Y. B., and Yakubu, M. N. (2021). Determinants of learning management systems during covid-19 pandemic for sustainable education. Sustainability (Switzerland), 13(9). https://doi.org/10.3390/su13095189

Elshami, W., Taha, M. H., Abuzaid, M., Saravanan, C., Al Kawas, S., and Abdalla, M. E. (2021). Satisfaction with online learning in the new normal: perspective of students and faculty at medical and health sciences colleges. Medical Education Online, 26(1). https://doi.org/10.1080/10872981.2021.1920090

Gismalla, M. A., Mohamed, M. S., Ibrahim, O. S., Elhassan, M and Mohamed, M. N. E. (2021). Medical students' perception towards E-learning during COVID 19 pandemic in a high burden developing country. BMC Medical Education, 21(1). https://doi.org/10.1186/s12909-021-02811-8

Iftikhar, S., and Mahmood Cheema, K. (2022). Medical students' perception of online assessment at a private medical college. Health Professions Educator Journal, 5(2), 15–18. https://doi.org/10.53708/hpej.v5i2.1258

Javed, K., Nasir, U. B., and Javed, A. (2023). Measuring Emotional Intelligence in First Year Medical Students. National Journal of Health Sciences, 8(1), 18-22.

Jiang, Z., Wu, H., Cheng, H., Wang, W., Xie, A., and Fitzgerald, S. R. (2020). Twelve tips for teaching medical students online under COVID-19. Https://Doi. Org/10.1080/10872981.2020.1854066, 26(1). https://doi.org/10.1080/10872981. 2020.1854066

Kaini, S., and Motie, L. Z. (2021). Virtual vs Online: Insight From Medical Students. Comment on "Effectiveness of Virtual Medical Teaching During the COVID-19 Crisis: Systematic Review." JMIR Med Educ 2021;7(2):E27020 https:// Mededu.Jmir.Org/2021/2/E27020, 7(2), e27020. https://doi.org/10.2196/27020

Lah Nik-Ahmad-Zuky, N., Aryffin Baharuddin, K., and Fuad Abdul Rahim, A. (2020). Association of Education in Medicine and Health Sciences Universiti Sains Malaysia (USM) experience. Education in Medicine Journal. 12(2), 75–80. https://doi.org/10.21315/eimj2020.12.2.8 Mortagy, M., Abdelhameed, A., Sexton, P., Olken, M., Hegazy, M. T., Gawad, M. A., Senna, F., Mahmoud, I. A., Shah, J., Elkholy, A., Mahmoud, A., Elframawy, A., Emara, A., Abualez, A., Naeem, A., Mohamed, A., Fahim, B., Saadeh, D., Yehia, H.,Aiash, H. (2022). Online medical education in Egypt during the COVID-19 pandemic: a nationwide assessment of medical students' usage and perceptions. BMC and Medical Education, 22(1). https://doi.org/10.1186/s12909-022-03249-2

Muflih, S., Abuhammad, S., Al-Azzam, S., Alzoubi, K. H., Muflih, M., and Karasneh, R. (2021). Online learning for undergraduate health professional education during COVID-19: Jordanian medical students' attitudes and perceptions. Heliyon, 7(9), e08031. https://doi.org/10.1016/J.HELIYON.2021. E08031

Mukhtar, K., Javed, K., Arooj, M., and Sethi, A. (2020). Advantages, limitations and recommendations for online learning during covid-19 pandemic era. Pakistan Journal of Medical Sciences, 36(COVID19-S4), S27–S31. https://doi. org/10.12669/pjms.36.COVID19-S4.2785

Nimavat, N., Singh, S., Fichadiya, N., Sharma, P., Patel, N., Kumar, M., Chauhan, G., and Pandit, N. (2021). Online medical education in india – different challenges and probable solutions in the age of covid-19. In Advances in Medical Education and Practice (Vol. 12, pp. 237–243). Dove Medical Press Ltd. https://doi.org/10.2147/AMEP.S295728

Owston, R., York, D., and Murtha, S. (2013). Student perceptions and achievement in a university blended learning strategic initiative. The Internet and Higher Education, 18, 38–46. https://doi.org/10.1016/J.IHEDUC.2012.12.003

Pei, L., and Wu, H. (2019). Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta-analysis. Medical Education Online, 24(1). https://doi.org/10.1080/10872981.2019.1666 538

Rajab, M. H., Gazal, A. M., and Alkattan, K. (2020). Challenges to Online Medical Education During the COVID-19 Pandemic. https://doi.org/10.7759/ cureus.8966

Wang, V. X., and Torrisi-Steele, R. (1 C.E.). Reflective Learning in the Digital Age: Insights from Confucius and Mezirow. Https://Services.Igi-Global.Com/ Resolvedoi/Resolve.Aspx

Wasfy, N. F., Abouzeid, E., Nasser, A. A., Ahmed, S. A., Youssry, I., Hegazy, N. N., Shehata, M. H. K., Kamal, D., and Atwa, H. (2021). A guide for evaluation of online learning in medical education: a qualitative reflective analysis. BMC Medical Education, 21(1). https://doi.org/10.1186/s12909-021-02752-2

Wei, H. C., and Chou, C. (2020). Online learning performance and satisfaction: do perceptions and readiness matter? Distance Education, 41(1), 48–69. https://doi.org/10.1080/01587919.2020.1724768

AUTHOR'S CONTRIBUTION

S.T: Conception of the idea, data collection, analysis of results, writing and editing of manuscript.2.BB: data collection and review the article.
B.B: Literature search, sampling, acquisition, and analysis of data