Turk J Public Health
Available online at: https://dergipark.org.tr/tjph
doi:10.20518/tjph.848138

ORIGINAL ARTICLE / ORİJİNAL MAKALE

Perceptions of e-learning among medical students during COVID-19 pandemic in a medical institution, Kerala

Kerala bir tıp kurumunda COVID-19 pandemisi sırasında tıp öğrencileri arasında e-öğrenime yönelik algıları

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Received: 28.12.2020, Accepted: 08.08.2021

ABSTRACT

The ongoing COVID-19 pandemic has made a smorgasbord of changes in the educational sector worldwide. It has compelled us to resort to internet media as an alternative to complete the required syllabus. **Objective:** To assess the perceptions of E-learning among medical students in private medical institution in Kerala. **Methods:** A cross-sectional study was conducted among medical students in a private medical institution for a period of 2 months. Three hundred and two medical undergraduates from all batches who consented to participate were included in the study. Data was collected using a semi structured questionnaire through Google forms. **Results:** E-learning was preferred by 19.9% students over conventional classroom learning and 74.2% perceived it as difficult. Nearly half of the students were anxious about their future education and career. Flexibility of learning (75.5%) was a major advantage whereas technological constraints (85.6%), fatigue of eyes (60.3%), lack of motivation (54%) were some of the constraints of E-learning listed by them. **Conclusion:** Overall, three – fourth of the medical students have had a good E-learning experience. However acceptable alternatives are to be adopted by the medical universities for maintaining the uniformity of teaching and retaining the quality of medical education.

Keywords: COVID-19 pandemic, E-learning, Kerala, Medical students, Perceptions

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Cite This Article: Kuruvilla BS, Thomas AM, Kalliath JD, John A, Rose B, Perceptions of e-learning among medical students during COVID-19 pandemic in a medical institution, Kerala. Turk J Public Health 2021;19(3):235-243.

ÖZ

Devam eden COVID-19 salgını, dünya çapında eğitim sektöründe büyük bir değişiklik yaptı. Bizi gerekli müfredatı tamamlamak için alternatif olarak internet medyasına başvurmaya zorladı. **Amaç:** Kerala'daki özel tıp kurumundaki tıp öğrencilerinin E-öğrenme algılarını değerlendirmek. **Yöntem:** Özel bir tıp kurumundaki tıp öğrencileri arasında 2 aylık bir süre boyunca kesitsel bir çalışma yapıldı. Çalışmaya tüm gruplardan katılmayı kabul eden üç yüz iki tıp öğrencisi dahil edildi. Veriler, Google formları aracılığıyla yarı yapılandırılmış bir anket kullanılarak toplandı. **Bulgular:** E-öğrenmeyi geleneksel sınıfta öğrenmeye göre öğrencilerin% 19.9'u tercih etmiş ve% 74.2'si zor olarak algılamıştır. Öğrencilerin yaklaşık yarısı gelecekteki eğitimleri ve kariyerleri konusunda endişeliydi. Öğrenme esnekliği (% 75.5) önemli bir avantaj iken, teknolojik kısıtlamalar (% 85.6), göz yorgunluğu (% 60.3), motivasyon eksikliği (% 54), E-öğrenmenin listelediği kısıtlamalardan bazılarıydı. **Sonuç:** Genel olarak, tıp öğrencilerinin dörtte üçü iyi bir E-öğrenme deneyimi yaşamıştır. Bununla birlikte, tıp üniversiteleri tarafından öğretim tekdüzeliğini sürdürmek ve tıp eğitiminin kalitesini korumak için kabul edilebilir alternatifler benimsenmelidir.

Anahtar kelimeler: Kovid-19 pandemisi, uzaktan eğitim, Kerala, tıp öğrencisi, algılar

Introduction

In times of the current nationwide lockdown (COVID -19 pandemic), education especially Medical Education would have been at stake if not for E-learning. E-learning refers to the use of electronic resources to deliver education and training. E-learning which was moving at a snail's pace was pushed 10- 15 years ahead of time by Covid-19 Pandemic.[1] Even few years back, the regulatory body of medical education in India, had realized the importance of the technology in medical education.[2] However, the pandemic has compelled us to use it as a learning platform to impart knowledge and skills to the students to at least complete the required syllabus on time.[3] E-learning also fosters self-directed learning since it replaces conventional didacticism.[4] Synchronous (learning and teaching in real time), Asynchronous (learning and teaching occurring at different time), Blended (use of both methods) are the three types of E-learning.[5,6] Various learning platforms like Zoom, Cisco-WebEx, Microsoft Team, Moodle etc have emerged which the faculty uses to teach the daily lessons. In addition, medical educators are now resorting to Google classroom which enables the use of Google calendars to schedule timings for various classes, share files, post comments etc. It gives ample opportunities for students to turn in assignments using Google Doc and there is also a provision for getting assessed using grade system. E-learning technology can be used in the improvement of all the learning domains viz cognitive, psychomotor and affective. In the cognitive domain, group teaching in classrooms could be enhanced by online material like pre-lecture assignments and audio-video clips during the sessions. Even students could be provided with virtual resources like audio-video clips, animations, and web-links for self-directed learning for their use. In the affective domain, videos of good and bad communication skills, self-recordings can be used to stimulate learning.[7] Psychomotor skills, although best learnt with real practice, can also be augmented by technology, at least up to the 'knows how' level. Flexibility, interactivity (file sharing, use of chat box, annotations), security enhancements, cost- effectiveness, learning from anywhere and at anytime are some of the benefits the new type of

learning offers.[8,9] However, the cons of E-learning cannot be overlooked as it throws fresh challenges to the faculty (tracking invisible online students, netiquette issues) and students also face some barriers like having no android phone or laptops, technical issues like internet connectivity, lack of motivation etc.[10] According to studies done in South India, majority (>70%) of medical students preferred E-learning for interactive learning sessions and considered it as a good supplementary tool in medical education. However, students do not prefer it for practical sessions.[10,11] Considering the above facts, this study was undertaken to assess the perceptions of E-learning among medical students in a private medical institution in Kerala.

Methods

A cross-sectional study was conducted among medical undergraduate students at a private medical college in Kerala for a period of two months (July, 2020 – August, 2020). MBBS students having smart phones or laptops and those willing to answer the questionnaire through Google forms were included in the study. Those medical students who had not attended online classes were excluded.

The sample size was calculated using the prevalence rate from a study done in Chennai in India using the formula.[11]

$$n=\frac{4pq}{d^2}$$

Where,
p = 57
q = 43
d = 10% (allowable error)
Sample size was calculated to be 302.

Simple random sampling technique was the sampling method used. Study tool used for data collection was a semi-structured questionnaire consisting of socio-demographic details, E-learning perceptions, benefits and barriers of E- learning in medical education during COVID-19 Pandemic. The questionnaire was sent to students as Google forms with its link sent in the specific Whatsapp group. The students were asked to answer the questionnaire and respond within a week. Collected data was entered in Microsoft Excel and was analyzed using SPSS version 20 software. Descriptive statistics was expressed in percentage and frequencies.

Ethical committee approval was obtained from institutional ethics committee prior to the study and written informed consent was obtained from students prior to data collection. Anonymity was also maintained in the questionnaire as well.

Results

Socio-demographic Details

Among 302 students, majority of the respondents were in the age group of 20-22 years. Furthermore, the respondent cohort comprised of 72.2% females and 27.8% males which approximately matched the gender balance of students in most of the medical colleges in the state. More than half (58.9%) of the students received E-learning lessons at their homes located in rural areas. The subjects were almost similarly distributed among various batches -first year 26.5%, second year 21.6%, third year 27.7% and fourth year 24.2%.

Table 1: Socio-demographic variables (n = 302)

Variables		n	%
Age	17 – 19	22	7.3
	20 – 22	217	71.9
	23 – 25	62	20.5
	26 and above	1	0.3
Gender	Male	84	27.8
	Female	218	72.2
Place of residence	Rural area	178	58.9
	Urban area	123	40.7
	Campus (in and around)	1	0.4

Perceptions of E-learning

Only 19.9% students preferred E-learning over conventional classroom learning and most of the students (93%) used android phones due to convenience. Eighty five percent students used Cisco-WebEx because of better security features unlike other online platforms.[Table 2] . Sixty seven percent of the students' felt that their doubts were clarified during their E-learning sessions. [Table 4] More than half of the students (58%) agreed that lack of human element in this virtual type of learning had strained them mentally.[Table 3]. Even though exams have been postponed indefinitely on account of the pandemic, 58% students did not even want to take E- test. Majority of them (52%) turned in assignments using Whatsapp. Around three- fourth of the participants found E-learning arduous and 46% mentioned that household chores had affected their learning process. Around half of the students and their parents (48%) were apprehensive about their academics and future prospects. Overall, three-fourth of the medical students have had a good E-learning experience.[Table 4].

Benefits and barriers of E-learning

The most important benefit E-learning offered was the flexibility of learning (75.5%). Students could learn at their own pace, at anytime and anywhere. They (50.3%) could escape from the hassles of commuting on a daily basis [Figure 1]. However students complained of technological constraints (85.6%), strain of eyes (60.3%), lack of motivation (54%) and various other distractions.[Figure 2].

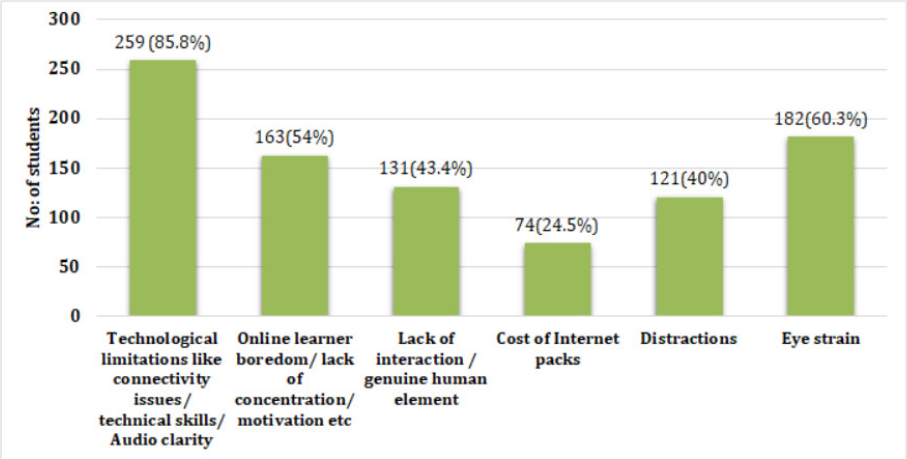

Figure 1: Most common barriers of E-learning

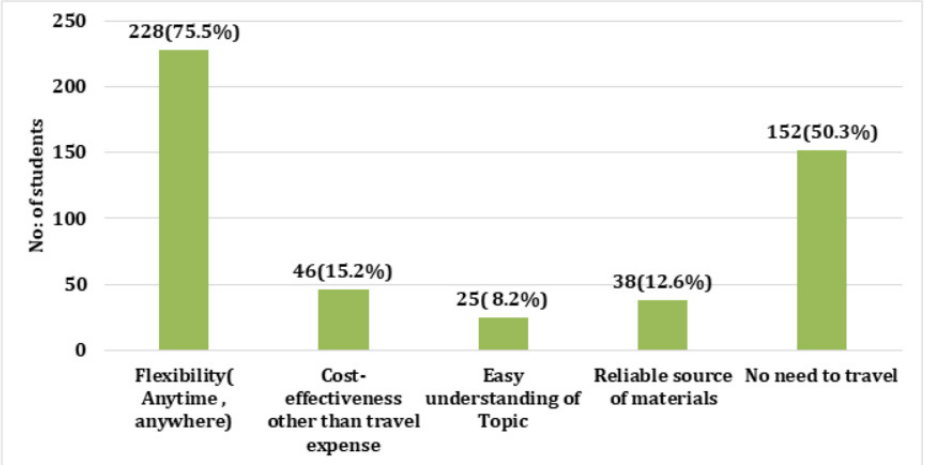

Figure 2: Most important benefits of E-learning

Only a few students recommended the need for training programs for E-learning as 67% of the students had already learnt it by this time. [Table 4]

Discussion

India has the second largest number of internet users in the world (ranked only behind China). However, the internet penetration rate is about 50% in 2020 which means that half of the population does not have accessibility to internet. Results of the survey done in 23 states in 2020, showed that 56% students did not have access to smart phones for online learning.[12] Hence E-learning is considered as a challenge especially in the remote regions of the country. Moreover, majority of the internet users access the internet through their mobile phones.[13] According to a study done in Sree Ramachandran Medical University in Chennai, 77% students preferred E-learning for interactive sessions, 70% opined E-learning should be used as a supplementary tool in medical education.[11] Monali Hiwarkar et al. in her study showed that 84% medical students preferred supplementation of E-learning with conventional classroom learning which was higher than that of our study. However, only 25% students wanted to take E-tests whereas 42% of our students were ready for an E-test.[3] This might be due to the fact that our research was undertaken during COVID 19 Pandemic hence, students wanted to prevent further lag in their course if the condition prevails.

Table 2: Usage of E-learning (n= 302)

Questions	**Response**	**Frequency**	**%**
Are the sessions Interactive or Teacher centred	Interactive	172.1	57
	Teacher centred	129.9	43
Device used for E-learning	Smart Phone	281	93
	Computer	18.1	6
	Tablet	3	1
Commonly used Online Platform	Cisco-WebEx	256	85
	Zoom	22	7
	Microsoft Team	5	2
	WhatsApp	19	6
Danger of using online platforms	Security Issues	123.8	41
	Disturbing Issues	78.5	26
	Privacy Issues	99.7	33
Attendance of online Lectures	Always	137	45.4
	Often	116	38.4
	Sometimes	42	14.0
	Never	7	2.2
Frequency of weekly lectures	1-3	30.2	10
	4-7	105.7	35
	>8	166.1	55
Methods adopted to improvise medical knowledge and skills during this time (multiple response)	Reading Textbooks	236	78.1
	YouTube	127	42
	Wikipedia	32	10.6
	Webinar	17	5.6
	Online medical course	49	16.2

Our results also showed that almost half of the students and parents were worried about the future course of their education.

St John's Hospital, Bangalore and Christian Medical College, Vellore had utilized TUSK platform developed by TUFT's university for online teaching whereas in our study most of them (85%) used Cisco-WebEx as the online platform as it has better security features. In addition, more than two-thirds of the medical students in the above institutions had recommended training for E-learning whereas only one- fourth of our medical students had made this kind of recommendation.[14] The resultant lock down phase had compelled them to resort to self training for E-learning.

Forty eight percent medical students were anxious about their future education and career due to COVID 19 pandemic and the subsequent lockdown. Similarly a study done in Haryana among medical students during this phase showed that 40% of them were worried about their further studies and career.[15]

Our study found that 93% of students used smart phones for E-learning followed by laptops and tablets. Similarly, a study conducted in Pakistan during COVID 19 Pandemic also showed that 76% of the undergraduate students (MBBS and BDS) used mobile phones for E-learning followed by other devices.[16] A study done in Spain in 2019 showed that students chose mobile phones for E-learning compared to other devices.[17] Reasons cited were easier student-teacher interaction and flexibility through mobile phones compared to other devices. Only a few students (19.9%) preferred E-learning over traditional teaching methods in our study. There is a similar preference of E-learning in the study conducted in Pakistan also. [16] This might be due to the fact that the data for the aforesaid studies were collected during the early period of nationwide lockdown during COVID-19 pandemic. In our study, 85% of the students faced technological issues like internet connectivity problems and other audio-video clarity issues whereas a study done by Suraksha Subedi et al showed that only 63% had these kind of connectivity problems.[18]

Table 3: Percentage of students agreeing and disagreeing on E-learning (n = 302)

Questions	Response	Frequency	%
Practical sessions in medical education is better conducted in the department than through internet facility	Strongly Agree	221	73.2
	Agree	49	16.2
	No comments	14	4.6
	Disagree	13	4.3
	Strongly Disagree	5	1.6
E- learning should be mandatory in Medical Education	Strongly Agree	27	8.9
	Agree	99	32.8
	No comments	108	35.8
	Disagree	38	12.6
	Strongly Disagree	30	1.0
E-learning as a consequence of COVID -19 helped you technologically	Strongly Agree	27.2	9
	Agree	145	48
	No comments	90.5	30
	Disagree	24.2	8
	Strongly Disagree	15.1	5
Less face to face interactions with your peers have strained you mentally	Strongly Agree	69.5	23
	Agree	105.6	35
	No comments	84.6	28
	Disagree	30.2	10
	Strongly Disagree	12.1	4

Table 4: Students' Perceptions of E-learning

Questions	Response	Frequency	%
Preference of E-learning over conventional class room teaching method	Yes	60	19.9
	No	242	80.1
Perception about difficulty in E-learning	Easy	78	25.8
	Difficult	194	64.2
	Very difficult	30	10
Best options for Practical sessions to be conducted	Pre-recorded videos	76	2.5
	Youtube videos	45	15
	Audio clips	11	3.6
	To conduct after reopening	252	83.4
Effect of household chores on E-learning	Highly affected	12	4
	Moderately affected	93	30.8
	Least affected	35	11.6
	Not applicable	162	53.6
Recommend Training Programme by the college	Yes	76	25.2
	No	24	7.9
	Already learnt by this time	202	66.9
Perception about future education/ job	Anxious	145	48
	Hopeful	93.6	31
	No comments	63.4	21
Has any exams been postponed due to lockdown	Yes	223	73.8
	No	79	26.2
Would you like to take E-Test	Yes	127	42.1
	No	175	57.9
Best possible way of turning in assignments	Google classrooms	27.2	9
	WhatsApp	157	52
	Notebook method	117.8	39
Parents' worry about your Future	Always	130	43
	Often	54	17.9
	Sometimes	90	29.8
	Never	28	9.3
Doubt clarification by Faculty	Always	203	67.2
	Sometimes	81	26.8
	Never	18	6.0
Has anyone ever helped you with your online sessions	Yes	113	37.4
	No	189	62.6
Rate your E-learning experience	Excellent	13	4.3
	Very good	36	12.0
	Good	101	33.4
	Satisfactory	105	34.8
	Poor	47	15.5

It might be due to the fact most of the students in the aforesaid institution were from metropolitan cities therefore they had better network coverage.[6] Our medical students (84.5%) reported they were happy with the E- learning experience. However, the overwhelming positive response from our students was much less than the response of medical students in Khartoum, Sudan. Majority of the medical students (83.6 %) in Khartoum state had an excellent perception about E-learning since most of their teachers had experience working in developed countries where E-learning is advanced so they encouraged their students and clarified their apprehensions regarding the same.[19]

A study undertaken by IE Obi et al. in a medical school showed that 48% students felt socially isolated with E-learning whereas 58% had mentioned that lack of face to face interaction with their peers had strained them mentally.[20] Our study done during the COVID-19 pandemic accounts for the higher percentage.

Conclusion

Our study concludes only 19.9% medical students preferred E-learning over conventional classroom learning. The study also showed that majority of them perceived technical constraints (85.8%) as the main barrier to E-learning the reason being poor network coverage in their areas, security issues using online platform (41%) mental strain (58%) due to lack of interaction with their peers. Regarding the medical students' perception to E-learning, 89% felt practical sessions were better conducted in department than through internet media and only 41.7% felt E-learning should be mandatory. Another finding of our study is that E-learning is beneficial to students as they can learn from anywhere at any time without relocating thereby saving their money and time.

Taking into account the above facts we felt online method of teaching is effective in certain fields especially in preclinical subjects and that it should go side by side with the traditional method. However, it cannot completely replace our age old conventional teaching method.

Recommendations

Government initiatives for expanding internet facility and increasing the broad band width are needed to provide a uniform E-learning facility. This will not only enable the students to have better access but also provide better audio and video experience in E-learning. While this current pandemic presents new challenges, acceptable alternatives are to be implemented by the medical universities for maintaining the uniformity of teaching and retaining the quality of medical education. They could provide online training program for faculty to improve the quality of teaching. Considering the flexibility in schedules and the non-requirement to travel or to be away from home, E-learning should be considered as a good supplementary teaching option to traditional classroom learning method even after this lockdown period.

Ensuring good internet connectivity, interactive short sessions with students' active participation and prompt feedback after sessions will definitely improve the quality of E-learning in medical education.

Limitations: Our study was done only in one medical institution hence the result cannot not be generalized.

Acknowledgement

Ethical Declaration: Ethical committee approval was obtained from institutional ethics committee prior to the study(June 2020) and written informed consent was obtained from students prior to data collection. Anonymity was also maintained in the questionnaire as well.

Financial Support: None

Conflict of Interest: The authors declare no conflict of interest.

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