

**ORIGINAL ARTICLE**

**Assessment of Knowledge, Attitude, Perception and Barriers of E-Learning among medical students : A Cross-Sectional Study**

Sivasubramaniyan MK<sup>1</sup>, Kenche Bhavani<sup>2</sup>, Gorantla Ananda Krishna<sup>3</sup>

**ABSTRACT**

A learning system based on formalized teaching but with the help of electronic resources is known as E-learning. Countries around the world had imposed large-scale physical distancing measures and movement restrictions often referred to as 'lockdowns', to slow COVID-19 transmission by limiting contact between people. Students around the country had to undergo E-learning. The study is conducted to assess the knowledge and perception about E-learning among medical students, to assess the factors which act as a barrier to effective learning via E-learning platforms. A pre-tested questionnaire is sent to the undergraduate students of Osmania Medical College. 117 students were included in the study. Data was collected in Google Forms and analyzed using Google sheets. 91.5% of students had adequate knowledge and only 43.6% of students had a positive attitude towards E-learning. There is no significant difference between men and women in knowledge and attitude.

**Keywords:** E-learning, Medical students, Medical Education, Online Classes

**Introduction**

The World Health Organization (WHO) on March 11, 2020, has declared the novel Coronavirus (COVID-19) outbreak a global pandemic [1]. Countries around the world had imposed large scale physical distancing measures and movement restrictions often referred to as 'lockdowns', to slow COVID-19 transmission by limiting contact between people. India suffered a huge impact following the second wave of COVID-19 with the new strain of virus infecting children and young adults more frequently. the possibility of learning in traditional classrooms became questionable. Schools and colleges were locked for months. The challenges in traditional classroom learning include the risk of a potential outbreak in the classroom, contact of disease while travelling and during hospital-based clinical education. To overcome these challenges educational institutions had to move towards more modern methods of teaching and learning. A learning system based on formalized teaching but with the help of electronic resources is known as E-learning [2]. The students can learn wherever they are, without the fear of the spread of the pandemic.

1. Postgraduate, Department of Community Medicine, Osmania medical college, Koti, Hyderabad, Telangana, India; **Email:** dr.sivamk@gmail.com, Mobile: 9688412199
2. Professor & HOD, Department of Community Medicine, Osmania Medical College, Koti, Hyderabad. **Email:** bhavanikenche1969@gmail.com, Mobile: 8919722217
3. Assistant Professor, Department of Community Medicine, Osmania Medical College, Hyderabad. **Email:** docinhell@gmail.com, Mobile: 9966988331

**Corresponding Author:** Dr. Kenche Bhavani, Professor & HOD, Department of Community Medicine, Osmania Medical College, Hyderabad. **Email:** bhavanikenche1969@gmail.com, Mobile: 8919722217

Submission	31.03.2022	Revision	15.04.2022	Accepted	06.05.2022	Printing	29.06.2022
------------	------------	----------	------------	----------	------------	----------	------------

E-learning is learning conducted via electronic media, typically on the internet. Some of the methods for E-learning include scheduled live online video lectures with interactive discussions, providing study materials that students can download and utilize. These methods require skills for both the teachers and students. Other methods include pre-recording the classes by the teachers and sending them to the students so that they can utilize them whenever they want. The known few challenges to these learning models were difficulty in the evaluation and maintaining the student’s focus throughout the class.

**Objectives**

- To assess the knowledge, attitude and perception regarding E-learning among medical students
- To assess the factors which act as a barrier to effective learning via E-learning platforms

**Methods**

The study was conducted in Osmania Medical College. By non-probability sampling, the students of 3rd-year MBBS were selected and provided with a self-administered pre-tested questionnaire on February 2021. Out of 250 students, 117 students gave consent and responded. Those who did not give consent and those who failed to fill out the questionnaire completely are excluded from the study and analysis. The questionnaire is prepared under the guidance of experts. It is a semi-structured questionnaire with both open-ended and closed-ended questions. The questionnaire is split into 5 sections - demographic data, questions on knowledge, attitude, perception and barriers of E-learning. Questions were also asked about their experience and preference in E-learning.

Ethical clearance was taken from the Institutional Ethical Committee. The Knowledge on E-learning has 10 questions; correct responses carry 1 point while the wrong ones carry no point. A score of 7 and above is taken as adequate knowledge and below 7 is taken as poor knowledge. The Attitude section has 8 questions in the form of 5 points Likert scale ranging from ‘Strongly agree’ to ‘strongly disagree’. The positive responses carry 5 points while the negative ones carry 1 point.

**Results**

Of 117 responses collected, 57(48.7%) were male and 60 (51.3%) were female. The mean age of the participants was 19.7±0.7 years. Most of the students are from Urban locality 92 (78.6%). Regarding Socio-economic status, 69(58.9%) students belong to the upper-middle class, 37 (31.6%) belong to the lower middle class, 10 (8.5%) belong to the upper-lower and 1(0.8%) belongs to the Upper class according to modified Kuppuswamy scale (Table-1).

**Table- 1:** Demographic details

Demographic features		No. of Students	%
Sex	Men	57	48.7
	Women	60	51.3
Locality	Urban	92	78.6
	Rural	25	21.4
Socioeconomic status (Modified Kuppuswamy Scale – 2020)	Upper	1	0.8
	Upper Middle	69	58.9
	Lower Middle	37	31.6
	Upper Lower	10	8.5
	Lower	0	0.0

All participants have experience in Zoom, 72 (61.5%) had experience in Google meet, 83 (73.5%) had experience in Telegram, 60 (51.3%) had experience in YouTube based learning and 34 (29.1%) have learned through other platforms such as WebEx, Marrow and Prepladder.

Figure -1: Proportion of students having adequate knowledge and positive attitude towards E-learning

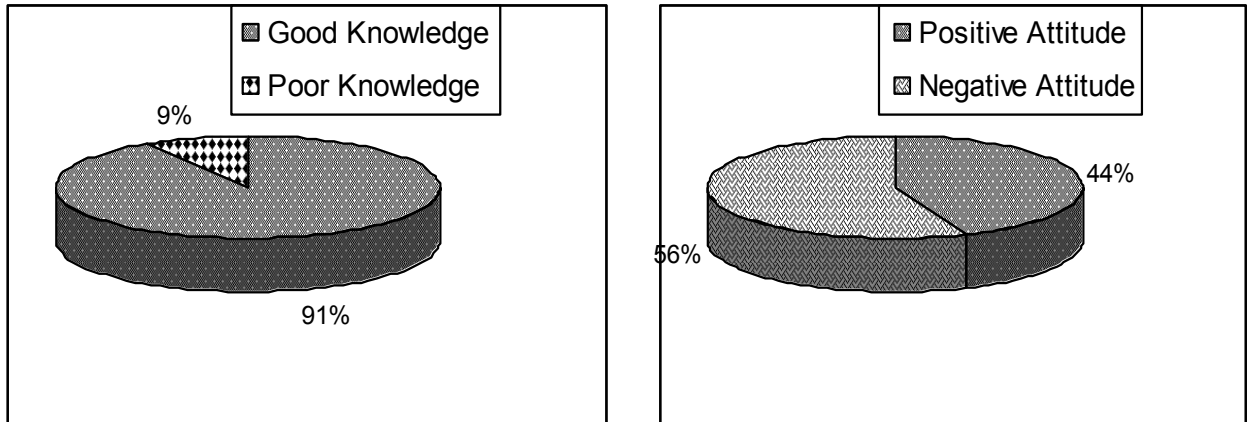
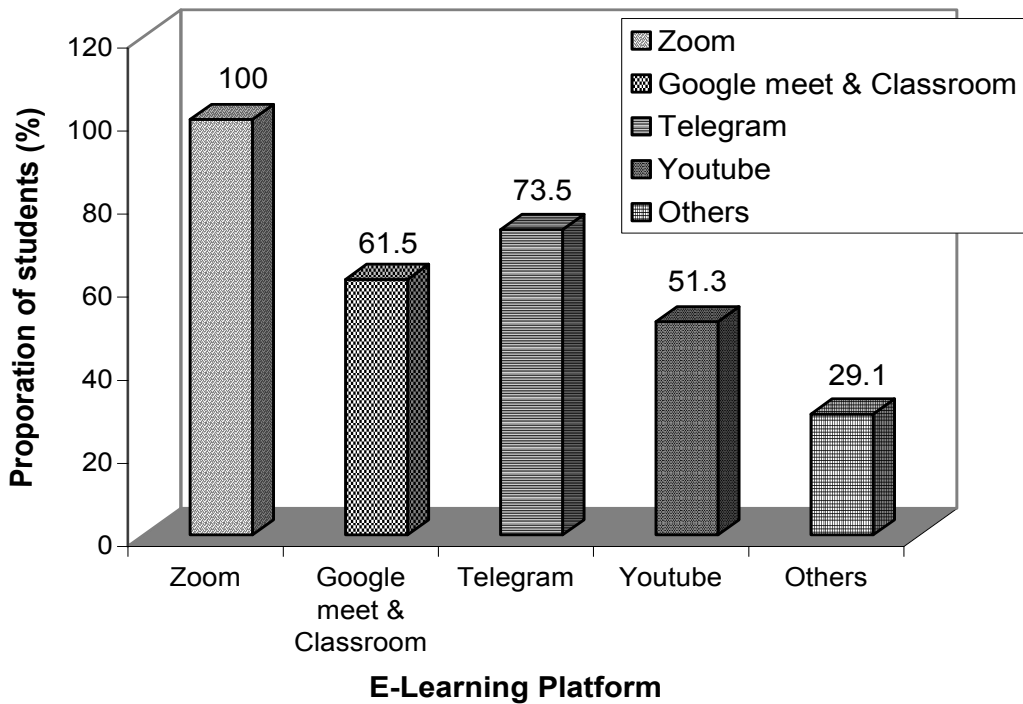


Figure 2: Proportion of students who were aware of various E-learning platforms



A score of a minimum of 70% in both knowledge and attitude is taken as adequate and positive. 107 (91.5%) students had adequate knowledge and only 51 (43.6%) had a positive attitude towards E-learning. There is no significant difference between men and women in knowledge ( $p=0.79$ , independent t-test) and attitude ( $p=0.12$ , independent t-test). Chi-square for trend is applied to find difference between knowledge and attitude among different socio-economic status (between upper middle, lower middle and upper lower) and is found significant ( $p<0.01$ ) for Knowledge regarding

E-learning and not significant for attitude (p=0.11). Knowledge is more among students belonging to higher socio-economic status.

**Table - 2:** Knowledge on E-learning

Questions	Correct Responses	
	No.	%
E-learning is a type of learning where the teacher teaches virtually from a distance and the student who is far away from learning through that.	111	94.9
E-learning is a type of learning where the student uses electronic devices such as computers, smartphones, etc.	117	100
E-learning is a type of learning where students read by themselves without the help of teachers.	73	62.4
Internet may or may not be used in the process of E-learning	56	47.9
Teachers can never evaluate in E-learning.	94	80.3
E-learning is the learning that teaches with the help of audio-visual aids.	115	98.3
E-learning is a very old method of learning and it had been practiced by developed countries about 150 years back.	114	97.4
E-learning is a type of learning where the student must come to the classroom to sit and read through their mobile phone.	113	96.6
The teacher uses chalk and a board while the students sit in an air-conditioned room.	117	100
E-learning does not require any technology-related skills	117	100

**Table-3:** Student’s attitude on E-learning ranked on a 5-point Likert scale (Strongly agree to Strongly disagree).

Statements on E-learning	Mean ± SD
E-learning can be a great opportunity to learn during the current Pandemic	4.06 ± 0.69
E-learning motivates me to learn more.	3.06 ± 0.78
E-learning is the future of medical learning.	2.61 ± 0.82
If E-learning services are available for free, I will learn extra time.	3.5 ± 0.82
Supplementary E-learning services should be there in the medical curriculum in addition to traditional classroom learning.	3.74 ± 0.88
I would be willing to spend money on E-learning services in future	3.28 ± 0.79
E-learning can increase productivity	3.41 ± 0.81
I am satisfied with E-learning	3.12 ± 0.74

Regarding class attendance and interest, only 24 (20.5%) students have attended all the classes, 66 (56.4%) students have attended most of the classes and 27 (23.1%) students have attended only some of the classes. Regarding their concentration during class, only 19 (16.2%) students attend class completely, 62 (53%) students attend most parts of the class, 34 (29.1%) students attend only a few parts of the class and 2 (1.7%) students do not attend any part of the class. 58 (49.6%) students prefer a live interactive session, 17 (14.5%) of students prefer live one-way lectures while 42 (35.9%) students prefer pre-recorded classes. In preference of an ideal number of students per E-learning session, 88 (75.2%) students preferred less than or equal to 100 students per session, 13 (11.1%) students preferred 101 to 200

students per session and 16 (13.7%) students preferred more than 200 students per session. Most of the students were using smartphones (84.6%) followed by laptops and computers (15.4%).

**Table 4:** Student’s perception of E-learning

Questions and responses		No.	%
<b>Do you regularly attend classes based on E-learning?</b>	All classes	24	20.5
	Most of the classes	66	56.4
	Some classes	27	23.1
<b>Do you listen to the classes from start to end?</b>	Attends complete class	19	16.2
	Attends most of class	62	53.0
	Attends parts of class	34	29.1
	Opens and skips off the class	2	1.7
<b>What type of E-learning sessions do you prefer?</b>	Live interactive sessions	58	49.6
	Live one-way teaching	17	14.5
	Pre-recorded content	42	35.9
<b>How many students do you prefer per session?</b>	<100	88	75.2
	100-200	13	11.1
	>200	16	13.7

The most common barrier to E-learning in the study is the poor home environment (53.0%), followed by lack of interest (49.6%), poor network connection (45.3%), poor monitoring (29.9%), lack of hands-on training (25.6%), difficulty (10.3%) and non-availability of smart phones and computers (6%) (Table-5).

**Table -5 :** Barriers to E-learning

Barrier to E-learning	Students	
	No.	%
Poor home environment (disturbances)	62	53.0
Poor monitoring	35	29.9
Lack of interest	58	49.6
Lack of hands-on training	30	25.6
Poor network connection	53	45.3
Difficulty	12	10.3
Non-availability of Smart phones and computers	7	5.9

**Discussion**

The finding of this study indicates that students are well aware of various E-learning methods but the attitude towards learning is poor. In a study conducted in Libya<sup>3</sup>, the knowledge about E-learning among students is only 57.5% which is less when compared to the current study where it is 91.5%. Compared to the study conducted in Jordan<sup>4</sup>, where only 35.4% of students were using smartphones in the current study 84.6% of students were using smartphones. In study conducted in Nigeria<sup>5</sup> about the motivation towards learning by E-learning the mean score is 3.6 more towards agree while in the current study it is 3 (Neutral).

### **Limitations**

The study has used non-probability sampling and the sample may not represent the sample universe.

### **Conclusion and Recommendations**

The study has found out various barriers of E-learning and it is recommended to find and consider these barriers for effective E-learning. Proper training of E-learning facilities to both students and teachers should be done. Many students prefer E-learning in a small group with less than 100 students to be effective.

### **Reference**

1. WHO Director-General's opening remarks at the media briefing on COVID-19 – 11 March 2020 [Internet]. [cited 2022 Mar 28]; Available from: <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>
2. What is E-learning? Definition of E-learning, E-learning Meaning – The Economic Times [Internet]. [cited 2022 Mar 11]; Available from: <https://economictimes.indiatimes.com/ definition/e-learning>
3. Alsoufi A, Alsuyihili 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* 2020; 15(11):e0242905.
4. Al-Balas M, Al-Balas HI, Jaber HM, Obeidat K, Al-Balas H, Aborajooch EA, et al. Distance learning in clinical medical education amid COVID-19 pandemic in Jordan: current situation, challenges, and perspectives. *BMC Med Educ* 2020; 20:341.
5. Obi IE, Charles-Okoli AN, Agunwa CC, Omotowo BI, Ndu AC, Agwu-Umahi OR. E-learning readiness from perspectives of medical students: A survey in Nigeria. *Niger J Clin Pract* 2018; 21(3):293–300.

**Citation:** Sivasubramaniyan MK, Bhavani K, Krishna G Ananda. Assessment of Knowledge, Attitude, Perception and Barriers of E-Learning among medical students - A Cross-Sectional Study. *Indian J Prev Soc Med*, 2022; 53 (2): 96-101