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Original Research Article

Assessment of knowledge, attitude and practice towards e-learning among undergraduate medical students, Andhra Medical College, Visakhapatnam

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ABSTRACT

Background: E-learning refers to utilization of internet technologies to enhance knowledge and performance of the learners and to improve the effectiveness of educational interventions. From the review of literature it was evident that e-learning has gained popularity in past decade, however its use is variable among medical colleges. The objectives of the present study were to assess knowledge, attitude and practice towards e-learning among undergraduate medical students.
Methods: A cross-sectional study was done among 150 medical students (50 each from 1st, 2nd and 3rd year) of Andhra Medical College, Visakhapatnam in the Month of December 2018. A pre-tested semi-structured questionnaire was administered to access the knowledge and practices. Students' responses in attitude were collected and rated on 5-point Likert scale from 1=strongly disagree to 5=strongly agree. Results are displayed in frequencies and proportions. A p value of <0.05 is considered as statistically significant.
Results: A total of 150 undergraduate medical students were included, among them 67 (40.6%) were males, 98 (59.4%) were females. Majority were aware of e-learning. Nearly 46.7% students used both laptop and smart phones for purpose of e-learning. About 53% were confident in using software applications. Most of students agreed that e-learning has important role in acquiring clinical skill along with other learning methods and 88% of students agreed that it should be supplemented in regular teaching curriculum. The 3rd year students were found to have better attitude towards e-learning than other students.
Conclusions: Majority felt that e-learning plays an important role in acquiring clinical skill along with other learning methods in educational institute. So, there is need to provide necessary infrastructure and include e -learning as a part of curriculum in medical education.

Keywords: Attitude, E-learning, Knowledge, Practice, Undergraduate medical students, Visakhapatnam

INTRODUCTION

Medical education is constantly growing at a rapid speed and to keep the upcoming doctors and established physicians in par with the competitive world e-learning has become a necessary tool and the platform most commonly used is learning management system.[1-3]

E-learning is also called web-based learning, online learning, or internet-based learning. It constitutes electronic devices to disseminate the content from a teacher to a student or to the learner from other electronic sources like internet. The media in e learning includes text, images, animation, live streaming of videos and audios which are made for an easy understanding. The advantage with e-learning is the increased accessibility to information, ease in updating content, personalized

instruction, ease of distribution, standardization of content, and accountability. Learners have control over the content, learning sequence, pace of learning, time and this allows them to meet personal learning objectives.[4,5] The development of computers and evolution of internet, Information Technology has had a positive impact on health care delivery system worldwide, particularly in the areas of disease control, diagnosis, patient management and teaching.[6,7] E-learning can be used by medical educators to improve the efficiency and effectiveness of educational interventions in the face of the social, scientific, and pedagogical challenges.[8] The future of e-learning seems brighter with the concept of blended learning where e-learning will be mixed with the practical or classroom based education. Knowledge explosion in medicine has made medical teaching much more complex, more information-dependent, and more technology-oriented.[9-12]

Hence the following study was conducted to assess the knowledge, attitudes and practice towards e-learning among medical students. This will help to identify the needs of the students in relation to application of technology for education.

METHODS

The present study is a cross-sectional study done among undergraduate medical students of Andhra Medical College, Visakhapatnam, Andhra Pradesh, in the month of December 2018. Fifty students from 1st, 2nd and 3rd year MBBS respectively were randomly selected using simple random technique (random tables) after the line listing of students. If the student was absent on the day of data collection, next student was selected randomly so that it make up a sample of 50 in each year. The total students participated in the study were 150. Informed consent was taken prior to study. Each student was given questionnaire and made to sit separately so that there is no cross talk or transfer of ideas. The questionnaire was distributed after brief introduction of study to the participants. The questionnaire was administered to obtain the details regarding were demographic data, students' knowledge regarding software applications and internet browsing for the purpose of e-learning, attitude towards e-learning using a 5-point Likert scale from 1=strongly disagree to 5=strongly agree; practical use of different modes of e-learning and role of e-learning in acquiring clinical skills. Data entry was done in Microsoft Excel 2010 and analysis done using SPSS version 17. Results were displayed in form of frequencies and proportions. Chi-square and ANOVA tests were used. P value of <0.05 was considered statistically significant.

RESULTS

A total of 150 undergraduate medical students participated in the study. Out of them, 61 (40.6%) were males, 89 (59.4%) were females belonging to the age group 19-25 years with mean age of 20.28±1.4 years. Out of total participants 92 (61.3%) were hostellers, 58 (38.7%) were day scholars as shown in Table 1.

Table 1: Demographic characteristics of study participants (n=150).

Variable	Frequency (N)	%
Age (in years)		
≤20	99	66
>20	51	34
Gender		
Males	61	40.6
Females	89	59.4
Residence		
Hostellers	92	61.3
Day scholars	58	38.7

Table 2: Infrastructure available to undergraduate medical students for e-learning.

Availability of computers/laptops	Frequency (N)	%
Own personal laptop/computer	57	38
Colleagues	55	36.7
Public facility	20	13.3
None	18	12
Total	150	100
Internet access		
Present	128	85.3
Not present	22	14.7
Total	150	100

Regarding availability of computers and internet facility for purpose of e-learning, 57 (38%) owned a personal laptop or computer; majority 128 (85.3%) of them had access to internet facility as shown in Table 2. Regarding the availability of infrastructure at the institution, only 45 (30%) agreed that they had satisfactory access to computers with internet facility. Coming to the devices commonly used, 46.7% said that they use both laptops or computers and 44.8% use only smart phones, 8.5% use only laptops or computers for e-learning as shown in Figure 1. This indicates increase in utilization of mobile phones for purpose of e-learning.

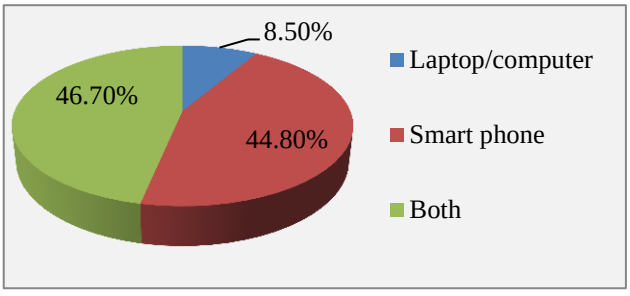

Figure 1: Devices most commonly used by respondents for purpose of e-learning.

While understanding the students' knowledge in software applications and internet usage, it was observed that 87.2% were competent in browsing internet, 53.3% were competent in preparing power point presentations during presentations, 45.5% were competent in using Microsoft excel as shown in Figure 2.

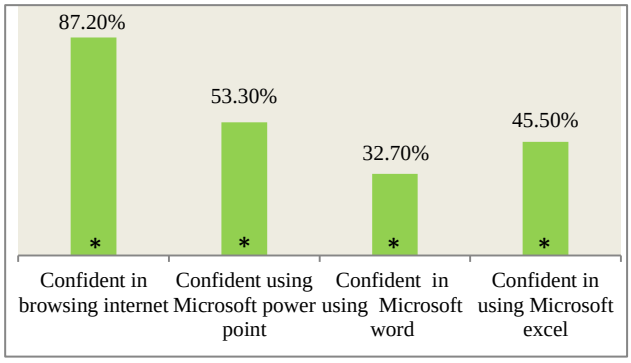

Figure 2: Knowledge regarding software applications among participants for e learning.

* Each bar is proportion of total sample.

While understanding the attitude towards e-learning on 5 point Likert scale, on adding the students' responses (agree and strongly agree), 142 (94.7%) agreed that e-learning is method of learning and teaching using electronic media, 122 (81.33%) agreed that e-learning is useful in standardization of teaching and learning, 106 (70.7%) agreed that e-learning is useful in improving their overall academic performance,135 (88%) agreed that it should be supplemented in regular medical education curriculum as shown in Table 3.

Students' practice of using different modes of e-learning is shown in Figure 3. Online videos, images appeared to be the most popular aspects of e-learning to acquire clinical skills among students compared to descriptive texts, online assessment, online lectures etc. While studying the usefulness of different methods of learning for acquiring clinical skills among students, 74.5% agreed that e-learning is useful in acquiring clinical skills next to hospital based or bed-side learning method which was 86.7% and other methods of learning like reading textbooks (70%) and community based study (66%).

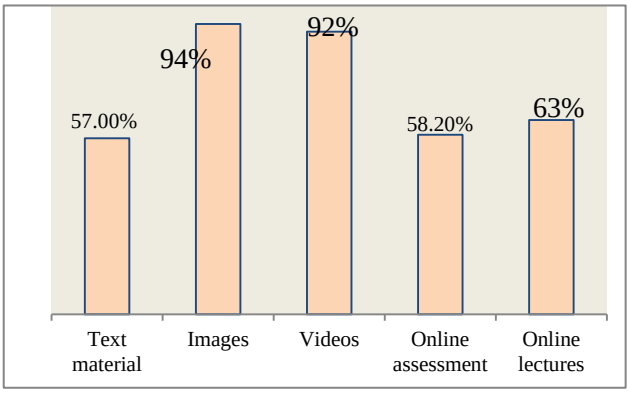

Figure 3: Utilization of different modes of e-learning by study participants.

The time spent by the participants for purpose of learning online in hours per week ranged from 0-28 hours with mean duration of 6 hours. There is no significant difference between the mean time spent for e-learning among the three different groups ($F=1.27$, $p>0.01$). All year students are equally spending time on e-learning. In the present study there is a significant gender difference regarding e-learning with females spending less time when compared to males and also in possession of own computer females own less number when compared to males as shown in Table 4.

There is significant difference between the responses regarding the attitude towards e-learning among the 1st, 2nd, 3rd year students, as the years of study advances the usage and appreciation of e-learning is increasing as shown in Table 5.

Table 3: Attitude towards e-learning among study participants (n=150).

Attitude	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
E-learning is method of learning and teaching using electronic media	1	2	5	20	122
E-learning is useful in my academic performance	2	14	28	72	34
I review e-learning material prior to my learning sessions	25	45	37	28	15
I find e-learning useful in my self-assessment	7	16	24	76	27
I find e-learning useful in exam preparation	10	25	35	60	20
E-learning improves standardization of teaching	7	3	18	72	50
Computer or web based training should be made available to supplement lectures	5	8	5	67	65

Table 4: Possession of computer and time spent for e-learning vs gender.

	Possession			Total	P value
Gender	**Own**	**Others**			
Male	31	30		61	<0.01 χ^2= 12.96
Female	20	69		89	
Total	51	99		150	
Time spent for e-learning					
Gender	**<5 hours**	**5-15 hours**	**>15 hours**		
Male	32	21	8	61	<0.01 χ^2=9.86
Female	67	19	3	89	
Total	99	40	11	150	

Table 5: Comparing the attitude regarding e-learning among different year students.

Attitude	Response	1st year	2nd year	3rd year	Total	P value
Overall e-learning is useful in my academic performance	Agree and strongly agree	22	38	46	106	<0.01 χ^2=28.81
	Other responses	28	12	4	44	
I review e-learning material prior to my learning sessions	Agree and strongly agree	10	13	20	43	<0.05 χ^2=5.15
	Other responses	40	37	30	107	
I find e-learning useful in my self-assessment	Agree and strongly agree	23	35	45	103	<0.01 χ^2=22.55
	Other responses	27	15	5	47	
I find e-learning useful in exam preparation	Agree and strongly agree	16	26	38	80	<0.01 χ^2=19.5
	Other responses	34	24	12	70	
E-learning improves standardization of teaching	Agree and strongly agree	39	38	45	122	>0.15 χ^2=3.77
	Other responses	11	12	5	28	

DISCUSSION

In the present study, among 150 undergraduate medical students, 59.4% were females, 40.6% were males. About 38% of medical students had access to their own laptops and 85.3% had access to internet facility. In the studies done by Yapa et al, Silva et al, Jawaid et al, regarding attitude towards e-learning among medical students, majority of the students had access to their own computers and had better internet facilities compared to the students in this study.[13-15] The study showed that only 30% agreed that they were satisfied with the available infrastructure in the institution. This identifies the need to build up infrastructure to increase accessibility and availability for the purpose of e-learning.

About 44.8% in this study preferred smart phones for purpose of e-learning when compared to laptops or computers which is only 8.5%. This represents the increase in role of mobile phones in internet based learning. The study showed that 87% had good computer skills similar to studies done by Chowdary et al among Bangladeshi medical students and Chudasama et al.[16,17] In the present study nearly 32-53% of the participants had knowledge regarding Microsoft word, power point and Excel similar to the studies done by Visalam et al, Yapa et al.[13,18] This showed that there is need to train the students to improve their knowledge in utilization of software applications for better computer or web based learning.

Among the different aspects of e-learning in this study majority of students opted that they learn more by images, videos when compared to descriptive texts. This finding is in similar to the findings of study done by Yapa et al.[13]

Regarding attitude towards e-learning, majority of participants (81.33%) agreed that it would help in standardization of teaching and 70.7% agreed that it would improve their academic performance. Similarly in a study done by Varghese et al, who focused on an e-learning activity based on Biochemistry, reported that the extent to which students understood the subject and their ability to answer questions in assessments had improved as a result of using e-learning.[19] About 88% agreed that e-learning should be offered as supplement to regular traditional form of teaching in institution. These findings were similar to the studies done by Yapa et al, Thomas et al, Silva et al, Visalam et al, Kumar et al in medical students in Tamil Nadu, India.[13,14,18,20,21] The present study showed that most of students perceived that e-learning is comparable to other traditional methods for acquiring clinical skills similar to the study done by Gormley et al among medical students.[22]

In this study there was significant gender difference regarding e-learning with males having more access to infrastructure like computers or laptops than females and females spending less time in hours per week online for learning purpose when compared to males. These findings were similar to study done by Thomas et al.[20] In our study 3rd year students were found to have better acceptance for e-learning than others. This indicates that the students are prioritizing e-learning to acquire clinical skills than basic sciences, similar to the study done by Warnecke et al.[23]

CONCLUSION

The present study showed that computer assisted learning or e-learning can be a useful tool in enhancing the learning experience. Students had positive attitude towards e-learning and accepted supplementation of e-learning in regular traditional teaching methods. Lack of knowledge in computer skills along with poor technological infra-structure and resources at the institution could be a challenge for implementation of e-learning.

Recommendations

The study recommends the provision of infrastructure with internet facility and training of students for the purpose of e-learning in the institutions to improve the quality of medical education.

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