



Acceptance of online clinical teaching among students from a medical college in Chennai, Tamilnadu: a cross sectional study

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ABSTRACT

Background: Evolution is the key to the next stage. However, in the present COVID 19 pandemic era, teaching and learning techniques have shifted dramatically from conventional face-to-face approaches to virtual learning. This outbreak highlighted the need to expedite the digital revolution of medical education.

Methods: This is a cross-sectional research conducted at a medical college in Chennai, Tamil Nadu, from August 2021 to January 2022. Undergraduate medical students from a private medical college in Chennai were asked to participate in the survey using a simple random sampling method employing a pre-validated pre-tested semi-structured questionnaire.

Results: The study included 288 medical students in total. More than 55% of them opted to study clinical skills online. While 38% of students find online clinical training boring, more than 62% of medical students find it engaging and amusing. Only 52% of medical students thought online clinical training was excellent. On average, 54% of medical students thought online clinical training was really valuable.

Conclusion: The COVID 19 outbreak has wreaked havoc on the academic calendar to unprecedented levels. Despite the fact that both lecturers and students faced diverse problems, medical teaching remained a severe issue in online clinical education. Despite these restrictions,

both teachers and students are still adjusting to the novel teaching and learning methods. Medical institutions will progressively use online teaching methods for few more years, therefore we must be prepared.

Keywords: Education, Medical, Undergraduate, Pandemic, Perception.

INTRODUCTION

Distance learning is not a recent paradigm of education; it dates back to the 18th century and began as correspondence (postal) learning. Online/e-learning has long been a valuable and optional tool, but with technological advancements and simpler ways to communicate via telecommunication, the educational system has undergone a significant change. Online learning has increased dramatically through a variety of digital platforms, demonstrating that it is still a viable option in the modern world. The corona virus disease (COVID-19) has impacted all aspects of our lives including education and economy.¹ COVID-19 pandemic had a tremendous effect on medical education challenging the medical educationists to adapt to this whole unique situation as due to lock down government issued to stay at home as a result schools and colleges have been shut down across the world. This current crisis has developed the necessity for online education which have become a key component in the continuity of education. Medical colleges in view of lockdown shifted to live online or video-based learning.² As UNESCO observes an 87% interruption in student worldwide, and both teachers and students are becoming accustomed to this "New Normalcy," e-learning will play a significant role in the future.³ Teaching sessions cover key clinical conditions, case studies and examination questions via live-streamed tutorials through online platforms these days. In addition to generating the demand, this pandemic offered a possibility to hasten the digital transition of medical education. E-learning is helpful at supporting clinical education, according to research. Multimedia instruction helps people learn more effectively, and it is crucial for medical education. In addition, instructional videos give us the opportunity to "capitalize on the potential of moving images to teach procedures requiring expert methods and specialized physical examination".⁴ However, lack of motivation, absence of physical interaction with the instructor, social isolation, and no immediate feedback from the teacher are major disadvantages.⁵ In light of this situation, this study was created with the goal of evaluating student acceptability of online clinical instruction and exploring the accompanying issues that students encountered.

METHODS

A cross-sectional survey research conducted by the community medicine department of a Tertiary care Medical college in South India from August 2021 to January 2022. Medical students of all the four years were participated in the survey. Simple random sampling was used to choose the participants. The medical students were urged to respond appropriately to the questionnaire, which was distributed to them. All feedback was gathered and analyzed. Participants who did not complete the questionnaire were not included. The questionnaire was subdivided into six sections.

Basic information about the participants, including their year of study and their application on how to use cellphones or desktop computers, was provided in Section 1. Students opinions about online clinical education were the subject of questions in Section 2. They were rated on a 5-point Likert scale for how comfortable they felt taking online clinical courses. Additionally, it was asked about the preferred manner of communication, web conferencing tools, and online course formats. The difficulties that come with learning clinical skills online were covered in section 3. Ten restrictions were shortlisted, including the following: technical issues, unclear course material, reduced social interaction, lack of structure, lack of support, decreased motivation to attend class, lower teacher accountability, less convenient access to online clinical classes financially or logistically, language barrier, and patient-based case learning. Each question required students to respond using a Likert scale with a maximum score of 5, with 1 denoting less obstacles. The responses were divided into two categories for data analysis. Likert responses 1 and 2 were categorised as being in favour of online clinical teaching, but Likert responses 4 and 5 were grouped as being against it. Likert scale score 3 responses were categorised as ambivalent.

The overall benefits and satisfaction of the students with the online clinical education were measured in Section 4 using a 5-point Likert scale. Respondents who selected Likert 1 and 2 were placed in the group that was dissatisfied with online clinical teaching, while those who selected Likert 4 and 5 were placed in the group that was satisfied with online clinical teaching. Equivocal respondents were those with a Likert scale of 3.

Questions about the advantages and drawbacks of online clinical courses from the perspective of students were included in Section 5. Respondents scoring 4 and 5 were categorised as benefitted respondents, whereas respondents scoring 1 and 2 were categorised as not benefitted respondents. Equivocal respondents were those with a Likert scale of 3.

Section 6 questions focused on the future of online clinical education. Tables 2, 3, and 4 tabulate a total of 28 sub-questions from all sections of the questionnaire. Statistical analysis was performed on the results obtained.

STATISTICAL ANALYSIS

SPSS version 21 is used for data analysis. The Likert scale scores for each parameter were tabulated and analysed. For a sample size of 288, the Z test was used to determine the Test for One Proportion. A p-value of 0.05 was used to define statistical significance.

The students' Likert scale responses were compiled. Responses 1 and 2 were combined into a single group, while responses 4 and 5 were separated. The third Likert scale responses were treated separately as ambiguous and were excluded from statistical analysis. These two groups were compared, and the p-value was calculated using the one-proportion test.

More analysis was performed on the table that assessed the issues faced by respondents to determine the greatest challenge faced by students in online clinical instruction. (Table 3). A Mean score and an average weighted score were generated by averaging the five Likert scale responses to determine and rank the biggest problem the students encountered. The weighted average score was calculated by adding the Likert scale score and the number of people who

answered each sub-question. The total of each Likert scale was used to calculate the weighted average score for each sub-question. The weighted average score was divided by the total number of respondents (n=288) to calculate the mean score. The highest mean value identified the most difficult challenge that the students were facing.

The relationship between the preference for online learning and related variables was also evaluated using p-value and t-value (Table 5).

RESULTS

A total of 288 medical students took part in the study. They were all fourth-year undergraduate medical students who received their regular academic sessions online. Figure 1 displays our participants' demographics and smartphone usage.

Females made up roughly two-thirds of the respondents (n=180, 62.5%) (Fig 1a). The majority of the students are familiar with smartphone use. More than 46.2% of them have spent 4 to 6 hours on their smartphones (Fig 1b). Table 1 presents students' perspectives on online clinical teaching.

About 62% of medical students found online clinical teaching enjoyable and interesting while 38% of students find it boring. Most of the students used Google meet (43%) and zoom app (41%) as a platform for online education. Nearly 58% of them prefer online clinical teaching, amongst 42% feel that Demonstration method of clinical teaching would be preferred.

Among the 288 students 55% of them have preferred online teaching while 46% did not prefer online method for education. Table 2 describes the overall gains and satisfaction coefficient of online clinical education.

Only 52% of medical students surveyed thought online clinical teaching was satisfactory in all ways. This disparity between groups was statistically significant (satisfactory and unsatisfactory group). Table 3 depicts the numerous challenges that teaching clinical skills online presents.

Students who answered on the Likert scales 4 and 5 faced more challenges, whereas students who answered on the scales 1 and 2 faced fewer challenges. Participants who answered 3 on the Likert scale were classified as undecided. Every difficulty that the medical students faced had a statistically significant difference. The medical students were able to overcome technical issues and missing patient-based case learning with the help of the maximum score from the weighted average score and mean scores. Following challenges for students included a lack of social connection, decreased motivation to attend class, unclear course material, a lack of structure, and limited financial or logistical access to online clinical programmes. Table 4 describes about the benefits and limitations of online clinical teaching.

Among the respondents 54% of the medical students felt online clinical teaching were greatly beneficial and due to some limitations 46% of the students were not benefitted by this method of

teaching. There was a statistically significant difference between the two groups. Table 5 shows the Association between preference of online teaching and related variables.

There was a significant association between the preferred and do not preferred groups with the help of T-test with few variables that are found to be common among both the groups. Lesser social interaction, decreased motivation, language barrier and missing patient based case learning were found to be the hurdles faced by both the groups. Fig. 2 shows the preferable mode of online clinical teaching by the medical students

About 58% of the medical students preferred to have classroom mode for clinical teaching while only 6% of the students preferred online clinical teachings and remaining preferred both.

DISCUSSION

E-learning and online education has been emphasised more during the recent years due to the pandemic that posed an unprecedented challenge to the academic schedule. This questionnaire based study helps us to understand the medical students acceptance of online clinical teaching.

Almost 62% of medical students found online clinical teaching enjoyable and interesting. The remaining 38% of students find it boring or disliked. This clearly makes us understand that the students are facing difficulties to adapt themselves to the innovations in medical teaching, since clinical teaching mainly focused on patients examination and doctor – patient relationship.

Though power point presentations with audio and video are used for online teaching, nearly 42.4% students find teaching clinical skills using Demonstration will be comfortable.

Nearly 73% of the students have been using Google Meet over Zoom and other online platforms for attending their online clinical classes. As no extra charges are applied for the students to attending the classes through this web platform.

According to Kalpana et al study on medical students perceptions of online learning, more than 80% of students found online education very satisfactory and about 70% of students felt very beneficial, whereas in this study, only 52% of students were satisfied with online clinical teaching and 54% were benefitted by online teaching.³

In a study on the perceptions of medical students towards online teaching, Samiullah Dost et al. discovered that family distraction (27.76%) and poor internet connection (21.53%) are the barriers perceived by the students to using online teaching, whereas in this study, we discovered that technical difficulties and missing patient-based case learning were the most significant challenges faced by the medical students.^{4,6}

Siddhartha Dutta et al. concluded that the majority of undergraduate medical students were unsatisfied with clinical teaching (42%), and we discovered that approximately 48% of students were dissatisfied with online clinical teaching in this study.⁵

Emmanuelle Motte-Signoret et al. conducted a study on the perception of medical education by learners and teachers on online teaching and found that 71.9% preferred pre-recorded lectures with no live interaction and 62.3% preferred live online classes with the possibility of

communication with the teacher, while nearly 58% prefer online clinical teaching method, with 42% believing that demonstration method of clinical teaching would be preferred in this study.^{7,8} In this study we came to know that most of the students preferred online clinical teaching and the satisfactory level were higher which was similar to the finding found in the study done by Hye Won Jang et.al.,⁹

Anjali verma et al. conducted a study on the perception of medical undergraduate students on online teaching and discovered that 57% of students felt online classes were safe, comfortable, enjoyable, good use of time, and reading on those topics reduced their stress, which is similar to the findings in our study.¹⁰

Michael Co et al. conducted an online teaching on basic surgical skills study on medical students by dividing them into cases and controls and using the mean score at the clinical competency assessment of the control group was 4.8/5 (range 4-5) and that of the case group was 4.7/5 (range 4-5) ($p = 1$). Students in the web-based surgical skill learning session (WSSL) reported no problems with programme or hardware installation. Because they mainly examined basic clinical abilities, the WSSL students may have had less difficulty than the other group students.¹¹ In our study we did not assess the basic clinical skills and only the students point of view on online clinical teaching based on the questionnaire related to web platforms, barriers, advantages and disadvantages.

Limitations of the study: As all the study participants are from a single medical college, the findings are only applicable to similar contexts as the way of teaching varies from each college and also based on the inclusion and exclusion criteria. A survey should be conducted based on our findings across the province for Generalizability. Though there are few limitations present in our study, the findings offer an understanding of benefits, limitations, gains and recommendations to improve clinical teaching, which is the need of the day.

CONCLUSION

The COVID 19 pandemic has presented a hitherto unheard-of difficulty to the academic calendar. Although both teachers and students faced many obstacles, medical instruction remained a significant issue in online clinical education. Every educator has a responsibility to guarantee a smooth, ongoing, and efficient process of teaching and learning. Students and teachers are still working to adjust to the novel teaching and learning methods despite a few drawbacks. We must prepare for increasing adoption of online teaching techniques in medical schools in the next years. Change is inevitable, but it typically comes slowly and subtly. However, the current pandemic problem has compelled academics and reformers of education to undertake quick preparations and significant changes.

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DECLARATIONS

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Figure 1: 288 respondents demographic information. 1A depicts the gender distribution, and 1B depicts the duration of respondents' smart phone usage.

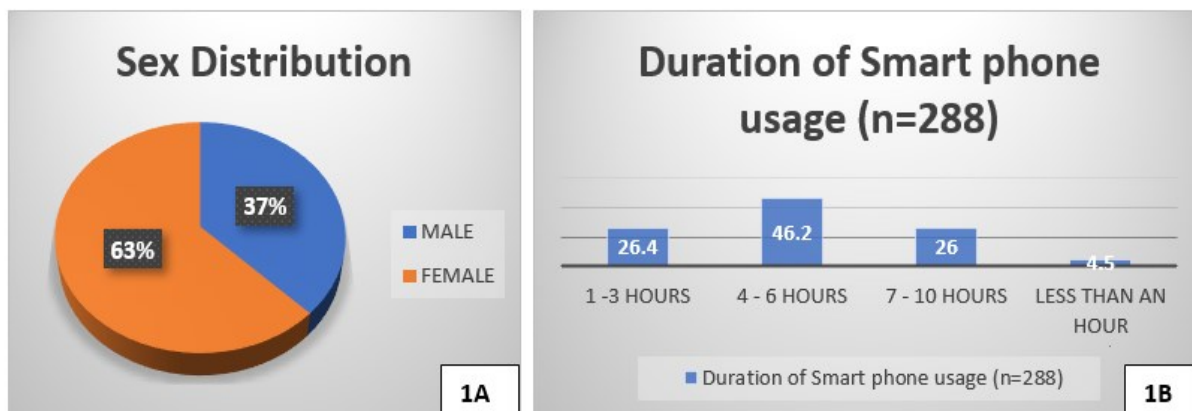


Table 1: Students perception on online clinical teaching

Feature	Number	Percentage (%)
Year of Study		
I year	90	31.3
II year	90	31.3
III year	54	18.6
IV year	54	18.6
Perception on online clinical education		
Monotonous, but enjoyable	99	34.4
Enjoyed	80	27.8
Boring	68	23.6
Did not like	41	14.2
Apps / Tool that is used for online clinical class (*multiple choice answers)		
Google classroom	85	29.5
Zoom app	118	41
Google meet	124	43.1
Whatsapp	69	24
Skype	14	4.9
Youtube	29	10.1
Do you prefer online clinical teaching?		
Prefer	157	54.5
Do not prefer	131	45.5
Type of communication preferred for online clinical education?		
Demonstration	122	42.4
Power point with video	92	31.9
Power point with audio	60	20.8
Power point	14	4.9

Table 2: Overall gains and students satisfaction of online clinical education (Likert scale 1 – 5)
5 – Very satisfied. 1 – Very dissatisfied

Overall gains and students satisfaction of online clinical education (n=288)							
Gains and satisfaction coefficient of online clinical teaching	Satisfied group			Unsatisfied group		p-value	95% CI (%)
	5	4	3	2	1		
Resource materials provided before classroom was adequate	63 21.9%	105 36.5%	89 30.9%	23 8%	8 2.8%	0.003*	6.8% - 31.5%
Acquired good knowledge on key concepts of the topic	43 14.9%	108 37.5%	108 37.5%	21 7.3%	8 2.8%	0.006*	14.9% - 46.6%
Improved clinical skills by my active participation during clinical sessions	31 10.8%	85 29.5%	115 39.9%	44 15.3%	13 4.5%	0.001*	15.4% - 44.5%
Online classes motivated to revisit difficult topics and seek expert guidance	27 9.4%	68 23.6%	125 43.4%	50 17.4%	18 6.3%	0.000*	12.3% - 39.7%
Prefer online clinical classes over in person clinical classes	31 10.8%	54 18.8%	58 20.1%	65 22.6%	80 27.8%	0.007*	7.2% - 27.1%
Access to online materials any time feel more relaxed	37 12.8%	117 40.6%	97 33.7%	24 8.3%	13 4.5%	0.000*	11.1% - 33.7%
The visual impact with videos/pictures should be continued	58 20.1%	114 39.6%	89 30.9%	15 5.2%	12 4.2%	0.009*	18.5% - 40.3%

*p<0.05 – Statistically significant

Table 3: Challenges with online clinical teaching (Likert Scale 1 – 5)
5 – Stronly agree. 1 – Strongly disagree

Challenges faced during online clinical teaching (n=288)								
Challenges	More Challenges		Equivocal	Less Challenges		Weighted average score (1 -5)	Mean score for (1 -5)	p-value
	5	4		3	2			
Technical difficulties	93 32.3%	140 48.6%	42 14.6%	5 1.7%	8 2.8%	1169	4.10	0.000*
Unclear course content	40 13.9%	117 40.6%	105 36.5%	12 4.2%	14 4.9%	1021	3.55	0.000*
Lesser social interaction	61 21.2%	118 41%	80 27.8%	14 4.9%	15 5.2%	1060	3.68	0.005*
Lack of structure	30 10.4%	97 33.7%	128 44.4%	28 9.7%	5 1.7%	983	3.41	0.001*
Lack of support	27 9.4%	94 32.6%	107 37.2%	33 11.5%	27 9.4%	925	3.21	0.000*
Decreased motivation to attend the class	66 22.9%	105 36.5%	79 27.4%	20 6.9%	18 6.3%	1045	3.63	0.001*
Less accountability by teachers	25 8.7%	73 25.3%	154 53.5%	26 9%	10 3.5%	941	3.27	0.006*
Less economic or logistic access to online clinical classes	34 11.8%	88 30.6%	136 47.2%	21 7.3%	9 3.1%	981	3.41	0.009*
Language barrier	23 8%	63 21.9%	117 40.6%	73 25.3%	12 4.2%	876	3.04	0.004*
Missing patient based case learning	122 42.4%	95 33%	48 16.7%	9 3.1%	14 4.9%	1166	4.05	0.001*

*p<0.05 – Statistically significant

Table 4: Benefits and limitations of online classes (Likert Scale 1 – 5)

5 – Well benefited. 1 – Not benefited

Benefits and limitations of online clinical classes (n=288)							
Benefits and limitations of online classes	Benefited group		Equivocal	Not benefited group		p-value z-test	95% CI (%)
	5	4	3	2	1		
You can participate in classes from anywhere	55 19.1%	151 52.4%	63 21.9%	14 4.9%	5 1.7%	0.000*	14.07% - 33.76%
The class is more student centered than offline classes	38 13.2%	72 25%	127 44.1%	36 12.5%	15 5.2%	0.000*	10.65% - 26.28%
The online classes are more teacher centered	35 12.2%	66 22.9%	149 51.7%	32 11.1%	6 2.1%	0.0745	14.56% - 32.32%
The teachers are more organized and prepared in online classes	41 14.2%	100 34.7%	115 39.9%	23 8%	9 3.1%	0.004*	18.05% - 37.98%
Technologically more advanced after the advent of online clinical classes	40 13.9%	107 37.2%	107 37.2%	23 8%	11 3.8%	0.009*	36.23% - 57.76%
More relaxed in online clinical classes	45 15.6%	111 38.5%	88 30.6%	31 10.8%	13 4.5%	0.001*	10.62% - 28.10%
Less stressed of being questioned	47 16.3%	98 34%	101 35.1%	36 12.5%	6 2.1%	0.000*	15.14% - 34.48%
Can engage in parallel activities	32 11.1%	102 35.4%	115 39.9%	28 9.7%	11 3.8%	0.010*	15.55% - 36.78%
The examination done through is not satisfactory and not monitored	37 12.8%	86 29.9%	129 44.8%	21 7.3%	15 5.2%	0.0001*	22.4% - 36.49%

*p<0.05 – Statistically significant

Table 5: Association between preference of online teaching and related variables

	Prefer Mean±SD	Do not Prefer Mean±SD	t value	p value
Lesser social interaction	3.68 ±0.832	3.96 ± 0.798	2.899	0.004*
Not suitable for clinical sessions	3.96±0.835	4.27±0.804	3.287	0.001*

Decreased motivation to attend the class	3.59±0.863	4.02±0.890	4.219	0.000*
Language barrier	3.31±0.953	2.91±0.789	-3.867	0.000*
I am missing patient based case learning	3.96±0.884	4.42±0.764	4.656	0.000*

*p<0.05 – Statistically significant

Figure 2: Preferred mode of online clinical teaching

