

What More to do to Make Online Teaching an Attractive and Effective Tool for Medical Students? An Experience from a Rural Tertiary Care Institute in Haryana State, India

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ABSTRACT

Introduction

Though online teaching-learning methodology is not a new way of transferring knowledge and skill, however pandemic of COVID-19 has made it more relevant to all fields. Medical education is majorly dependent on patients and related resources. However, the current pandemic has pushed the medical fraternity to use online methods. Understanding the perception of end-users (medical students) may help get the best out of this methodology. Hence, we planned this study to know medical students' perception of the online teaching-learning methodology.

Methods

The present cross-sectional study was executed among the undergraduate medical students, from the first year to final year, of Bhagat Phool Singh, Government Medical College for Women, Khanpur Kalan, Sonapat of Haryana state, India. The data were collected through a semi-structured questionnaire sent to all students as a link to Google form. The study sample was selected through stratified random sampling. We assumed every batch of students as a stratum and randomly selected 25 students from each batch; hence, data analysis from 100 students was conducted.

Results

Most participants found the online teaching-learning methodology comfortable, time and money-saving. However, almost all of them refuted online methods for clinical or bedside teaching. Family distractions, internet connectivity, physical discomfort, isolated feeling, and poor interaction among peers were reported as barriers to online methods.

Conclusions

Selective use of online teaching-learning methodology with inbuilt peer interaction has enormous potential in medical education.

Keywords: online teaching-learning; online medical education; Haryana.

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INTRODUCTION

Online learning has seen a tremendous evolution from correspondence courses to actual online learning with the surge of the internet. Then formal accredited courses turned into highly customized courses because of mobile technologies. Digital technology has reached every corner of the world so is the online teaching and learning methodology.^{1,2} However, before the pandemic of COVID-19; online teaching-learning methods mainly served the willingness of the learner end. But life-threatening COVID-19 compelled every teacher and learner to reach through the online ways to gain knowledge and skills necessary for personal growth or academic fulfillment.³⁻⁵

Like other fields, medical students did not remain untouched by COVID-19; in fact, they are affected because patients are their main study resources. COVID-19 protocol either created a wall between students and patients, or health facilities was occupied by COVID-19 patients and halted their lectures, bedside teachings, and examinations. These obstacles pushed the medical teachers and students to use online methods.^{6,7}

Over time, online teaching became the primary source of medical education and enabled students to continue their learning while keeping themselves from COVID-19.⁸

The options like virtual patient simulation, live-streaming, customized self-paced courses, and feedback and evaluation have made online teaching a resourceful asset to medical education and seen as an opportunity for every student.^{2,8-13} Also, offline and online are reportedly in the equivalence position in terms of outcomes. However, time constraints to implement effective online teaching, feeling of isolation, and disconnection are the well-reported limitations leading to dropout.^{2,14,15} Given all

limitations including technical and ethical issues, COVID-19 has offered an opportunity to explore online teaching in medical education, especially in developing countries like India, where the problem of insufficient resources can be addressed along with the provision of standardized medical education. However, to make the best use of online medical teaching, it needs to be sustainable even after the pandemic of COVID-19 is over.^{16,17} There must be a positive perception among the learners and teachers. Also, there is a need to find out the actionable points to potentiate the use of online learning in medical education. Hence we planned a cross-sectional study among the medical undergraduates of a rural tertiary care institute to understand their perception of online teaching as a teaching methodology.

METHODS

We executed the present study under the guidelines laid under the Helsinki Declaration 1975, revised in 2000.¹⁸ Before starting the data collection, we assured all the study participants of the confidentiality of the information gathered. We explained their right to leave the study in between on their will, too, without giving any reason. All the study participants understood that their participation was voluntary, and leaving the study in between would not affect their learning. We did not provide any incentive to the study students.

The current cross-sectional study was conducted among the undergraduate medical students of Bhagat Phool Singh Government Medical College for Women (BPSGMCW), Khanpur Kalan. The BPSGMCW is situated in the rural area of the Sonapat district of Haryana state of India. Every year 100 medical students are selected through an entrance examination. The course duration of Bachelor of Medicine and Bachelor of Surgery (MBBS) in India is five and half years, including

the last year of mandatory rotatory internship. The first four years are known as professionals (first to Third-I and Third-II).

As we deliberately wanted to keep the feeling of uniformity among students, we included all of them for the first step of data collection. The data was collected using a pretested semi-structured questionnaire through Google form.

First, we sent the Google form link to all the enrolled medical students of all professional years and gave a time of five days for submitting responses. Hence, we excluded responses received after completing five days of sending

were exported to Microsoft Excel Spreadsheet, 2007, and analysis in terms of frequencies, proportions, and chi-square test was performed in Statistical Package for Social Sciences (SPSS) version 20. Collecting and analyzing the data took two months, from January 2022 to February 2022.

RESULTS

The present study executed among 100 undergraduate medical students of BPSGMCW. We selected 25 students from each professional year.

Table 1. Distribution of the study participants by their practices regarding online learning before COVID-19.

Sr. No.	Factors studied	1st	2nd	3rd-I	3rd-II	Total	
1	Online platform used prior to COVID-19 (n=100)	Online courses-coaching for entrance exam	6	11	8	17	42
		Video tutorials-Youtube	10	6	8	4	28
		Live tutorials via Zoom	5	1	3	2	11
		None	4	7	6	2	19
	P=0.62						
2	Number of hours per day spent on online prior to COVID-19 (n=81)	1-2 hour	6	5	6	10	27
		2-3 hour	6	7	6	5	24
		3-4 hour	3	3	4	4	14
		>4 hour	6	3	3	4	16
	P=0.94						

the Google form link. All the obtained responses within the stipulated time were considered eligible for random selection to include for final analysis. We used stratified random sampling to select study students or responses.

We considered responses from every professional year as strata, and from every state, we randomly selected responses of 25 students through a lottery method. Hence the data from 100 medical students was collected. The data

Table 1 shows the practices of the study participants in the context of online learning before the pandemic of the COVID-19. The online courses to learn a new skill or get coaching for entrance examination for higher qualifications were the most common (42%) used platform, followed by a video tutorial on the youtube platform(28%).19% reported nil learning from the online platform. 40% of the users of online courses were from the final professional (3rd-

II). Among the online teaching-learning method users, one-third reported spending less than two hours a day before the COVID-19 pandemic. However, the association between professional year of study students and type of platform and the number of hours spent was not statistically significant.

the non-availability of a device for online classes was a barrier.

56% of the participants reported difficulty concentrating on learning, and almost one-third (30%) reported boredom as a significant psychological barrier to online teaching-learning

Table 2. Distribution of the study participants by their opinion about barriers and facilitators to the use of online teaching-learning.*

S. no.	Factors studied	The Professional year of the study students					Total
		1st	2nd	3rd-I	3rd-II		
1	Barriers related to environment and logistics (n=100)	Family distraction	10	12	8	7	37
		Internet connectivity	8	5	7	13	33
		Lack of space	3	4	4	2	13
		Timing of class	2	3	4	1	10
		Lack of devices	2	1	2	2	7
	p=0.69						
2	Psychological barriers (n=100)	Difficulty in concentration	12	13	13	18	56
		Boredom	9	7	9	5	30
		Feeling of isolation	4	3	1	0	8
		Anxiety	0	2	2	2	6
	p=0.44						
3	Facilitators to online Teaching-learning methodology (n=100)	More comfortable and ability to learn at own pace	12	11	9	14	46
		No travel	5	5	7	6	23
		Ability to ask questions.	5	4	6	3	18
		Interactive	2	2	1	2	7
		Cost saving	1	3	2	0	6
	p=0.76						

*As n for each statement is 100, %age has not been mentioned.

Table 2 shows the self-reported barriers and facilitators to online teaching-learning methodology. The distraction due to family members during online classes (37%) followed by poor internet connectivity (33%) was reported as the significant barrier to online teaching-learning methodology. Seven participants said

methodology.

While responding to facilitators to online learning, comfortable learning at their own pace (46%) was reported as the most common chosen facilitator, followed by travel-free learning (23%). Almost equal proportions find it interactive (7%) and cost-saving (6%).

Table 3. Distribution of study participants by their perception of online teaching methods.*								
S. N.	Statements	Responses	Professional				Total	p value
			1st	2nd	3rd-I	3rd-II		
1	Uses of social media increased as an adjunct to the virtual teaching-learning method.	Agree	18	16	15	14	63	0.57
		Neutral	5	8	5	8	26	
		Disagree	2	1	5	3	11	
2	Physical discomfort from virtual learning (exhaustion), visual discomfort from looking at the screen and muscle or joint pain.	Agree	19	21	20	16	76	0.19
		Neutral	5	4	4	5	18	
		Disagree	1	0	1	4	6	
3	Online teaching learning require self discipline	Agree	20	21	20	22	83	0.49
		Neutral	2	4	2	2	10	
		Disagree	3	0	3	1	7	
4	Increase in class attendance due to ease of access to the online teaching-learning platforms.	Agree	21	17	18	19	75	0.57
		Neutral	4	8	5	4	21	
		Disagree	0	0	2	2	4	
5	Lack of fair assessment due to lack of monitoring.	Agree	22	20	21	15	78	0.17
		Neutral	3	5	3	6	17	
		Disagree	0	0	1	4	5	
6	Online teaching-learning classes have flexibility with convenience.	Agree	16	12	16	16	60	0.53
		Neutral	6	12	6	7	31	
		Disagree	3	1	3	2	9	
7	Online teaching-learning classes lack of physical, mental, social support from peers & institutions.	Agree	19	19	18	20	76	0.88
		Neutral	5	6	6	5	22	
		Disagree	1	0	1	0	2	
8	It is difficult to find out safe and silent environment for online learning.	Agree	19	20	16	12	67	0.26
		Neutral	2	2	2	3	9	
		Disagree	4	3	7	10	24	
9	Online teaching-learning can replace bedside clinical teaching.	Agree	3	2	1	1	7	0.7
		Neutral	1	0	0	1	2	
		Disagree	21	23	24	23	91	
10	Clinical teaching through online method is not optimum	Agree	10	24	24	20	78	0.01
		Neutral	13	1	0	2	16	
		Disagree	2	0	1	3	6	
11	Operational or technical difficulty faced in using the virtual platform hinders the learning	Agree	20	23	17	14	74	0.96
		Neutral	0	0	1	2	3	
		Disagree	5	2	7	9	23	
12	There is weaker interaction between students and teachers in online teaching-learning classes.	Agree	22	24	25	21	92	0.13
		Neutral	0	0	0	2	2	
		Disagree	3	1	0	2	6	
13	Engagement of students during online classes is poor	Agree	8	6	3	10	27	0.05
		Neutral	3	4	1	6	14	
		Disagree	14	15	21	9	59	

*As n for each statement is 100, %age has not been mentioned.

Table 3 shows the study participants' perception of the online teaching-learning methodology. 75% agreed to the easiness and comfort of online methods (75%), which was also reported for increased attendance in the class ($p=0.57$). Almost all of the participants reportedly perceived self-discipline and having technical or operational knowledge of virtual platforms (74%) as the requirement for effective utilization of these methods (83%). 59% of the participants refuted the perception that online forms do not engage students ($p=0.05$). However, almost all the participants disagreed with the online teaching-learning methodology for clinical and bedside teaching, though it was not found to be statistically significant ($p=0.7$). A statistical significance association was found between the agreement of study students among the four professionals and the perceived suboptimal potential of online methods for clinical teaching ($p=0.01$). Mostly agreed that online teaching-learning methods cause physical discomfort (76%), poor interaction between peers (76%), and a perceived sense of poorly monitored assessment (78%) ($p=0.17$).

DISCUSSION

In the present cross-sectional study of undergraduate medical students of Sonapat, Haryana, we reported the exponential use of online learning in medical education during the pandemic of COVID-19. Almost dependency on online learning has revealed the facilitators and barriers to this mode of teaching-learning methodology, especially for medical education, which mainly revolves around the patients and related sources.

Our study identified facilitators to online learning that are in line with other reported studies that highlighted the comfort of learning at their own pace, travel free, and ability to ask questions as the primary facilitators. Dost et al.,

Kay et al., and Ni observed similar findings in their studies.^{12,19,20}

In addition, online teaching-learning methodology was associated with bodily discomfort (visual, muscle pain, loneliness), poor assessments of learners, and lack of interaction between teacher and learner and among the peer. Family distractions (37%) and internet connectivity (33%) made online learning less acceptable, especially for live classes, as significant barriers.

Family distractions (37%) and internet connectivity (33%) made online learning less acceptable, especially for live classes, as significant barriers. Cao et al. and Stowell et al. reported consistent findings related to online teaching but do not address that lack of interaction among peers leads to a rise in anxiety.^{21,22}

Online learning, mainly during the COVID-19 pandemic, has, in general, psychological effects on students. Online education deficient in interaction with peers and teachers has potentiated difficulty concentrating (56%) and feelings of isolation (30%). Cao et al. studied the psychological impact of COVID-19 and reported similar findings.²¹

Lockdown, restricted movements, uncertainties, and the risk of getting the infection could be the possible reasons for the high psychological impact.

COVID-19 has created an enormous dependence on online teaching-learning methods and made the current situation of medical education different than otherwise.

However, the current study's findings of physical discomforts (76%) such as exhaustion, visual despair from looking at the screen, and muscle or joint pain have revealed the necessity to sensitize the students on ergonomically

productive use of online learning methodology.

In our study sample, about 20% of students reported no use of online learning methodology before the COVID-19 pandemic, highlighting the missed opportunity to enhance learning and necessitating the need to generate felt needs among medical students from the start of the course.

Our findings highlighted the lesser role of online teaching-learning methods in medical education for clinical or patient-based learning or bedside learning (78%). Weaker interactions (92%) with the teacher in context with the patient could be a reason for less acceptability of online bedside learning. The student would also miss observed social skills and communication lessons with patients and their relatives, essential in medical education. Similar views were discussed in other studies conducted on online teaching to make it more conducive as a teaching-learning method.²³⁻²⁵

Assessment is also an important issue that needs to be highlighted because inefficient monitoring during examinations or viva-voce creates a sense of unfairness to students who otherwise performed well in tests. 78% of the present study sample expressed their perception of fairness in assessment. Barr RB et al. raised similar concerns on assessment.¹⁷

Although our study findings added actionable points to the insight of perception of medical students about online teaching-learning

methodology, however, there are some limitations that we would like to mention. First, we analyzed the randomly selected responses of one-fourth of the study population, which may have hindered the clear picture of the issue. Second, using google form would have promoted contamination of reactions among the study participants as selected participants could have been room-mates.

In addition to the limitations mentioned earlier, some strengths of our study are noteworthy. The random selection of participants in the present study at the level of responses could be an excellent way to collect data from students without creating a sense of discrimination. We used Google form for data collection, which expedited the process and compilation.

We suggest that a qualitative study on this subject may surface the intervention points' action to boost the best use of the online teaching-learning methodology.

CONCLUSIONS

Like other teaching-learning methods, online methods are not free from cons. However, selective use of online teaching-learning methodology in medical education can exponentially enhance medical students' learning.

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