

## Original Research

# Study on online teaching and learning during Covid-19 pandemic – Students' Perspective

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### ABSTRACT

**Introduction:** The coronavirus pandemic has seen the introduction of novel methods of delivering education to medical students. Accelerated development of IT systems and enhancement of Internet mechanisms have allowed online learning to become central to modern global education. Hence, the present study was undertaken to evaluate student's perception regarding study on online teaching and learning during Covid-19 pandemic. **Material and Methods:** A descriptive cross-sectional study was conducted using a Google Form containing the study questionnaire was circulated among specific social media groups comprising medical students in the institutions of the authors. The questions assessed perception toward online learning, using a five-point Likert scale. After receiving the responses, the data of this cross-sectional study was analysed. **Results:** Amongst the respondents, only 55.3% students had ownership of computer/laptop. 81.1% accessed e-learning through mobile phones. 83.6% and 80.0% students have shown familiarity with Google Classroom and Zoom respectively. 52.9% students preferred offline in person mode of teaching. 13.9% students had no availability of internet /Wi-Fi connection at home. 63% students said that electricity hampered their study. **Conclusion:** Online teaching has enabled the continuation of medical education during these unprecedented times. Moving forward from this pandemic, in order to maximise the benefits of both face-to-face and online teaching and to improve the efficacy of medical education in the future, we suggest, medical colleges resort to teaching formats such as team-based/problem-based learning.

**Keywords:** Covid-19 pandemic; Google Classroom; Online teaching; Zoom

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### INTRODUCTION

An extraordinary outbreak of pneumonia of unknown aetiology emerged in December 2019 in in China. A novel coronavirus was identified as the causative agent and was subsequently termed COVID-19 by the World Health Organization (WHO), and declared a global health emergency.[1] Studies have identified various circulating double-mutant and triple mutant strains of SARS-CoV-2 across different regions of India, which are more pathogenic than the initial strains. Such altered transmissibility and

pathogenicity indicate evolution of the virus.[2]The coronavirus pandemic has seen the introduction of novel methods of delivering education to medical students. Lectures have rapidly been developed to be delivered online as webinars using various platforms such as Zoom, with such technologically enhanced approaches already being proven to have high levels of engagement with medical students.[3] The highly contagious nature of the virus has made it difficult to continue lectures as usual, thus influencing the medical education process, which is based on lectures

and patient-based education.[4] Educators must plan to continue to provide medical education and patient care during the pandemic, and these services should be conducted in accordance with ethical frameworks that are based on beneficence and the professional virtues of courage and self-sacrifice.[5] Accelerated development of IT systems and enhancement of Internet mechanisms have allowed online learning to become central to modern global education.[6] To ensure the future healthcare workforce of our country are qualified, continuing education is vital and this can be achieved by medical faculty continuing to engage regularly with medical students using online teaching platforms. The current success of online teaching provides an initial insight into new and innovative methods of teaching for medical education.[7] Hence, the present study was undertaken to evaluate student's perception regarding study on online teaching and learning during Covid-19 pandemic.

## MATERIALS & METHODS

A descriptive cross-sectional study was conducted in October 2021, using a Google Form containing the study questionnaire was circulated among specific social media groups comprising medical students in the institutions of the authors. The questionnaire was developed by conducting open-ended interviews with medical students. Before administering the questionnaire, it was reviewed for content validity by three experts in the faculty. Items in the questionnaire were then modified and new items were added based on the qualitative review. The predictive validation was determined by administering an initial questionnaire to two randomly selected students. The self-administered online questionnaire was developed using Google form consisting of two sections with a total of 30 questions. At the beginning of the questionnaire, an introductory paragraph explained the objectives, the confidentiality of the responses and voluntary participation. The first section included 10 questions about the participants' demographic information, and the specific tools and devices used by undergraduates for online learning. The second section included 10 questions assessing perception toward online learning, using a five-point Likert

scale. After receiving the responses, the data of this cross-sectional study was analysed.

## RESULTS

We collected a total 700 responses, out of which 48.4% were from GMC Patiala followed by 17.7% from GGSMC Faridkot (Table 1). Participants included 56% females and 44% males; with age range of 17-25 years with a mean age of 20.4 years (Table 2). 74.4% participants belonged to urban area and 25.6% to rural area (Table 3). Amongst the respondents, only 55.3% students had ownership of computer/laptop (Table 4). 81.1% accessed e-learning through mobile phones (Table 5). 83.6% and 80.0% students have shown familiarity with Google Classroom and Zoom respectively (Table 6). 52.9% students preferred offline in person mode of teaching (Table 7). 13.9% students had no availability of internet /Wi-Fi connection at home. 63% students said that electricity hampered their study. Various questions were asked and the responses to them as a percentage of respondents making the given response on the Likert-scale are illustrated in the Table 8. It was found out that most students have sufficient equipment and IT skills for online learning. They found online tools easy to use, but most students were not happy with online teaching methods and lecture materials, aggravated by lack of interest due to the effect of lock down. They found traditional/live classroom lectures learning more effective due to lack of direct contact with teachers/ students/ colleagues/ friends in online teaching and other reasons like distractions from other family members during online lectures, lack of student-teacher interaction and facility to ask questions or clear doubts during online lectures.

Student perception of online teaching Out of 21 questions, 11 were regarding environment of online learning in which 7 are of positive sense and 4 are of negative sense, and 10 were regarding tools of online learning in which 8 are of positive sense while 2 are of negative sense. Most of students had positive response towards tools of online learning but have negative response towards environment of learning.

**Table 1: Distribution of students in reference to their Medical Colleges**

Students	Total		First Prof		Second Prof		Final Prof	
	N	%	N	%	N	%	N	%
GMC Patiala	339	48.4	67	23.3	137	51.1	135	93.1
GGSMC Faridkot	124	17.7	122	42.5	1	0.4	1	0.7
GMC Amritsar	77	11	4	1.4	69	25.7	4	2.8
Others	160	22.9	94	32.8	61	22.8	5	3.4
Total	700	100	287	41	268	38.3	145	20.7

**Table 2: Distribution of students in reference to age and sex**

Age in Years	Total		Male		Female	
	N	%	N	%	N	%
17	2	0.3	1	0.3	1	0.3
18	34	4.9	13	4.2	21	5.4
19	184	26.3	69	22.4	115	29.3
20	197	28.1	86	27.9	111	28.3
21	143	20.4	74	24.1	69	17.6
22	82	11.7	39	12.7	43	10.9
23 and above	58	8.3	26	8.4	32	8.2
Total	700	100	308	44.0	392	56.0

**Table 3: Distribution of students in reference to area of residence**

Area	Total		Male		Female	
	N	%	N	%	N	%
Rural	179	25.6	84	27.3	95	24.2
Urban	521	74.4	224	72.7	297	75.8
Total	700	100	308	44.0	392	56.0

**Table 4: Distribution of students in reference to ownership Of Computer/Laptop**

Ownership of Computer / Laptop	Total		Gender				Area			
			Male		Female		Rural		Urban	
	N	%	N	%	N	%	N	%	N	%
Yes	387	55.3	171	27.3	216	55.1	61	34.1	326	62.6
No	313	44.7	137	72.7	176	44.9	118	65.9	195	37.4
Total	700	100	308	44.00	392	56.00	179	25.57	521	74.43

**Table 5: Mode of accessing the online teaching**

Mode	Total		Gender				Area			
			Male		Female		Rural		Urban	
	N	%	N	%	N	%	N	%	N	%
Desktop	8	1.1	7	2.27	1	0.26	2	1.12	6	1.15
Laptop	124	17.7	60	19.48	64	16.33	20	11.17	104	19.96
Mobile	568	81.1	241	78.25	327	83.42	157	87.71	411	78.89
Total	700	100	308	44.00	392	56.00	179	25.57	521	74.43

**Table 6: Students familiarity with tools of online learning**

Gender	Google Classrooms		Zoom		Microsoft Teams		Others	
	N	%	N	%	N	%	N	%
Female (392)	332	84.7	313	79.8	122	31.1	27	6.9
Male (308)	253	82.1	247	80.2	100	32.5	28	9.1
Total (700)	585	83.6	560	80.0	222	31.7	55	7.9

**Table 7: Preferred mode of teaching**

Mode of teaching		Total		Area				Gender			
				Rural		Urban		Female		Male	
		N	%	N	%	N	%	N	%	N	%
Offline	On board	370	52.9	102	57.0	268	51.4	223	56.9	147	47.7
	On ppt	183	26.1	43	24.0	140	26.9	111	28.3	72	23.4
Online	Audio VC	14	2.0	4	2.2	10	1.9	7	1.8	7	2.3
	Premade ppt	82	11.7	18	10.1	64	12.3	28	7.1	54	17.5
	Video VC	51	7.3	12	6.7	39	7.5	23	5.9	28	9.1
Grand Total		700	100.0	179	25.6	521	74.4	392	56.0	308	44.0

**Table 8: Questions and the responses as percentage of respondents making the response and the median response.**

Question	Strongly Agree (1)	Agree (2)	Neither Agree nor Disagree (3)	Disagree (4)	Strongly Disagree (5)	Median
You have adequate equipment and facilities (computer / laptop / Internet / software) to participate for online lectures	38.6	41.6	8.4	7.8	3.6	4
You have adequate computer knowledge and IT skills to manage your online learning	30.9	41.8	14.9	8.4	4.0	4
Guidelines are provided (e.g. how to use relevant online tools) before starting online lectures by your lecturer	22.1	41.0	20.0	9.6	7.3	4
Online tools are easy to use	23.1	42.1	21.9	8.7	4.2	4
Satisfaction about online teaching methods and lecture materials	16.4	25.9	20.6	20.0	17.1	3
Frustration and lack of interest in learning while being locked down	32.7	30.3	16.7	10.3	10.0	4
Online lectures are effective than traditional/ live classroom lectures	11.1	16.7	21.1	24.9	26.2	2
Using online learning is fun	14.3	24.4	24.4	20.0	16.9	3
Gained experience of learning in a new online environment	19.7	42.6	21.0	9.3	7.4	4
Flexibility in participating for online lectures	21.7	37.1	22.4	10.6	8.2	4
Lack of direct contact with other students/ colleagues/ friends	41.0	40.6	10.1	3.9	4.4	4
Inconsistent/ poor contact and communication with the lecturers	34.9	38.7	15.7	5.6	5.1	4
Difficult than classroom	24.7	31.0	25.7	9.6	9.0	4
Motivation is high in participating online lectures	12.7	19.6	24.9	22.4	20.4	3
Satisfaction level about the student-teacher interaction during online teaching & learning	13.3	21.0	23.7	22.3	19.7	3
Do you have adequate facility to ask questions or clear doubts during online lectures	17.3	33.0	19.8	15.9	14.0	4
Lecturer's personal attention and touch are less	28.3	38.3	19.0	8.1	6.3	4
Home environment is suitable for participating in online lectures	21.5	33.7	19.4	13.7	11.7	4
Possibility of distractions from other family members during online lectures	27.2	35.4	17.4	10.9	9.1	4
Would you like to participate for online lectures with conventional lectures after COVID-19 pandemic is over	17.4	23.0	19.3	15.9	24.4	3

## DISCUSSION

Regarding students' engagement with online teaching platforms, overall, students did not find online teaching to be engaging or enjoyable, with limited opportunities to ask questions. Furthermore, did not find it as effective as face-to-face teaching. Our results suggest that students would like online

teaching sessions to be more interactive. This could be achieved via student response systems incorporating methods such as polls, quizzes or breakout rooms[8,9], which have been shown to encourage student participation[10], previous literature suggests the incorporation of online Question & Answer sessions to improve student

engagement[11], based on a previous model advising the use of synchronous learning. Synchronous learning is defined as a social learning environment alongside answering questions live. This active communication between lecturers and students allows ambiguous concepts to be addressed immediately to increase student involvement, creating a more active learning environment.[12]

Advantages of online teaching, with limitations

To students, the main advantages of online teaching are the time and money saved from the lack of travel, its flexibility and the ability for students to learn at their own pace. Further benefits of live online lectures[3] include opportunities for students to anonymously ask and answer questions, potentially encouraging further engagement from those who would not otherwise participate in a live lecture, due to the less intimidating environment online.[13] However, these benefits may not be applicable to all forms of online teaching. For example, the limited synchronous aspects of pre-recorded content may deter students due to the lack of opportunities to interact with lecturers.[14] Also, watching pre-recorded lectures, alongside the possibility of attending face-to-face lecture, has been shown to negatively correlate with learning success.[15] Similar to our study, commonly perceived barriers to using online teaching platforms included family distraction and poor internet connection also seen in studies conducted in the UK and China.[16,17]

This is the first study to look at the impact of COVID-19 on online teaching across the Punjab medical colleges. One of the strengths of this study is its large sample size of 700 medical students across all preclinical and clinical years. Furthermore, the recruitment of a variety of medical students for survey distribution minimised potential response bias. However, this study also had some limitations. Some medical schools may have been disproportionately represented with larger numbers of responses from some schools, for example, more participation from GMC Patiala in comparison to other medical colleges. Thus, the results may not be generalisable to the medical student population. Further, some aspects of this survey depended on participants' memory perhaps influencing their reporting, introducing elements of recall bias. To truly measure the impact of COVID-19 on student utilisation of online teaching, a more in-depth, qualitative analysis such as focus groups conducted in collaboration with medical schools is required to gather more accurate results, such as the effects on examination performance. Various perceptions might be related to unfamiliarity with the e-learning medium, different technological knowledge, and skills of the participants which highlight the need for formal training and workshops on using various technological methods and platforms for strengthening the e-learning activities.[18,19] We

recognize that COVID-19 has proven to be an extraordinary threat at the global level to which medical institutions have responded, but online education needs to be developed further.[20]

## CONCLUSION

Online teaching has enabled the continuation of medical education during these unprecedented times. Moving forward from this pandemic, in order to maximise the benefits of both face-to-face and online teaching and to improve the efficacy of medical education in the future, we suggest, medical colleges resort to teaching formats such as team-based/problem-based learning. More international collaboration may increase the quality and accessibility of online medical education. It has also been shown to be effective in terms of achieving learning outcomes. Beyond COVID-19, we anticipate further incorporation of online teaching methods within traditional medical education. This may accompany the observed shift in medical practice towards virtual consultations.

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