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Medical education in COVID period –student feedback and experiences

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ABSTRACT

Background: The pandemic of COVID-19 brought sudden change to online teaching from traditional teaching. This online teaching uses various digital tools. **Aims and Objectives:** To know the appropriateness of this online teaching, what modifications we need in future from the present-day online teaching, a cross-sectional survey was performed on the students of Government Doon Medical, Dehradun (Uttarakhand). **Materials and Methods:** A cross-sectional online survey was conducted from July 1 to 7, 2020 with participation of 194 medical students to critically evaluate the feedback of online teaching. **Results:** During pandemic, online mode of teaching such as online discussions, pre-recorded video, and sharing and uploading material was utilized. Students clearly opine a preference for face-to-face interactions and conventional mode of content delivery. **Conclusion:** The use of online mode of content delivery in medical colleges enriched by experiences during pandemic has ushered medical education in a novel era. However, further rigorous studies are needed to test the viability of a hybrid technique of teaching as an appropriate way ahead in the future.

Key words: Appropriateness; COVID-19 pandemic; Medical education; Online teaching

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INTRODUCTION

The pandemic of COVID-19 has forced a rapid changeover to online education and the introduction of various alternative assessment methods acting as a catalyst that has acted as a kickstart for transition to online medical education. The emergence of this pandemic has swiftly bought on the development of many innovative educational strategies in medical colleges all around the world, the majority of which encompasses the use of diverse digital tools.[1,2]

To avoid compromising the medical curriculum, the institutions scrambled to set digital platforms for lectures, practical, and other academic activities.[3] These platforms provided yet elusive flexibility of time for both teacher and students.[4,5] Online education was also available before the COVID-19 era, but the present pandemic brought dependency on this approach. Assessment in many colleges had to be partially shifted to online mode utilizing Google form, feedback form, etc.[6] Online assessments can encompass continuous and real-time feedback. We have already conducted an online survey looking at perception regarding online teaching among medical students when it started in the first wave.[7] We concluded that online teaching and learning was considered a good substitute to classroom teaching by students in the COVID-19 pandemic. However, discussions about the online mode of education are rife with a lot of concerns regarding student engagement, content perception, and technical challenges. The question remains that despite acceptability whether the online mode of education is just as appropriate as the traditional method of content delivery. Therefore, in the present study, we aimed to evaluate the appropriateness of online education mode, compare it with the pre-pandemic

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era, and identify factors influencing the feedback given by students.

This online survey including the medical students of GDMC, Dehradun, was designed to know the appropriateness of online education during the pandemic and compare it with before pandemic. These perceptions and feedbacks of the medical students regarding the present scenario may provide additional input, helping administration and faculty for further informed strategy.[8]

Aims and objectives

The study aimed at knowing perceptions of medical students regarding online teaching. Objectives were to gather feedback on online classes which were conducted and know the appropriateness of online educational process.

MATERIALS AND METHODS

Study design

An online survey was conducted from July 1 to 7, 2020 with the participation of 194 medical students to assess the appropriateness of online teaching.

Study setting

After taking ethical approval with the number- IEC/GDMC/2020/90 from the IEC of college for this study, a questionnaire was prepared in Google formats and separated into seven sections. The previous study conducted by us became a baseline for the development of this questionnaire.[6] The first part included demographic information of the students and the remaining parts assessed appropriateness, accessibility, online assessment, communication, quality of content delivery, and overall opinion of the online educational process, respectively. Demographic variables included age, gender, residence, and type of residence. It was pre-validated using expert opinion and volunteers among medical students. This questionnaire uses a 4-point Likert scale which would convert responses to scores from 0 to 3. Since we aimed to evaluate the appropriateness of online content delivery among medical students, therefore, our target population was the MBBS students from Government Doon Medical College, Dehradun. The link to the form was sent through the Gmail account to all medical students. The study participants were told about the details of study objectives, procedures, the average time required for answering questions, and a clause of confidentiality at the initiation of the survey. Their informed consent in digital form was collected. A thorough analysis of the situation was also attempted by authors to provide a birds-eye view of the situation and directions for the future.

Statistical analysis

Data collected were downloaded in Microsoft Excel spreadsheet format and analyzed using IBM SPSS v 24.0. Data were cleaned for outliers and invalid responses. Descriptive analysis was performed by summarizing the categorical variables as proportions and continuous variables in terms of means (with standard deviation). Inferential statistics were used for assessing the difference in mean independent t-test and ANOVA was used. For all analyses, the α was preset at 0.05 and β at 0.8.

RESULTS

The total number of medical students who participated in an online survey was 194. There is a slight difference in the percentage of males and females. The most of the students were in the 17–20-year age group and reside in urban area. About 67% of students had attended very little online teaching before the pandemic. The mean score of assessment of online methods was higher during pandemic than before pandemic. Table 1 describes the before the pandemic and during pandemic comparison of different online methods according to the general opinion of students. There is a significant difference between scores according to gender, age group, residence, previous experience, and ever did online teaching. No significant difference between mean appropriateness and communication scores according to the gender, age, residence, online teaching, and previous experience was found. The differences found between the mean accessibility score according to the age and residence were significant.

Before the pandemic (Table 2), students did not use or often use online methods such as online discussions, pre-recorded videos, sharing and uploading of study material, use of email, online quizzes, chats to clarify doubts, and assignments but during pandemic, the use of these online methods increases to a very high extent.

Appropriateness of online educational process (Table 3) when assessed was found to reflect partial student satisfaction since the impact of online education, student-teacher communication, interaction methods, formative assessment methods, active learning, immediate feedback, and accessibility ease was found to be satisfactory in more than 50%. The students preferred short and long questions answers assessment as compared to MCQs, in the Google form. This has been previously noted that short answer question enjoys wide acceptability among students and academicians.[9] Medical students have been proven to score higher in modules taught using face-to-face interactions as compared to online.[10]

Table 1: Different characteristics, categories, accessibility score, communication score, overall opinion score, and mean score before the pandemic and during pandemic (n=194)

Variables	N (%)	Mean Accessibility Score (Mean±SD)	Mean Communication Score (Mean±SD)	Mean Overall Opinion (Mean±SD)	Mean Score Before Pandemic (Mean±S.D) I	Mean Score During Pandemic (Mean±S.D) II	P-value (Comparison between column I and II)
Gender							
Male	94 (48.5)	3.54±2.45	5.79±4.50	3.11±2.46	5.54±2.81	10.05±4.58	0.024
Female	100 (51.5)	3.25±2.09	5.91±3.80	2.92±2.22	5.70±3.23	10.96±5.12	0.013
P value		0.124	0.147	0.124	0.248	0.021	
Age							
17–20	103 (53.1)	3.24±2.13	5.54±3.97	3.29±2.42	5.14±2.76	10.37±4.36	0.001
21–23	79 (40.7)	3.77±2.50	6.31±4.35	2.76±2.27	6.34±3.28	11.01±5.53	0.014
24+	12 (6.2)	2.16±1.19	5.42±4.14	2.33±1.77	5.08±2.84	8.58±4.23	0.023
P value		0.014	0.124	0.147	0.124	0.002	
Residence							
Urban	137 (70.6)	3.18±2.25	5.89±4.06	3.08±2.39	5.50±3.09	10.54±4.91#	0.127
Rural	57 (29.4)	3.89±2.27	5.75±4.35	2.84±2.20	5.91±2.88	10.45±4.86#	0.46
P value		0.001	0.124	0.154	0.168	0.048	
Experience of attending online Teaching							
None	64 (33.0)	3.39±2.47	5.39±4.34	2.51±2.19	5.67±2.69	10.79±4.47#	0.025
Little	130 (67.0)	3.39±2.18	6.08±4.03	3.26±2.37*	5.51±3.67	9.96±5.61#	0.016
P value		0.164	0.164	0.045	0.346	0.024	

Table 2: Different online methods were used by study participants before the pandemic and after the pandemic (n=194)

Online Methods	Before Pandemic				During Pandemic			
	Not at all n (%)	Often n (%)	Very Often, n (%)	Very high extent n (%)	Not at all n (%)	Often n (%)	Very Often n (%)	Very high extent n (%)
Uploading materials	87 (44.8)	92 (47.4)	13 (6.7)	2 (1.0)	32 (16.5)	88 (45.4)	59 (30.4)	15 (7.7)
Email (lectures and tutorials)	60 (30.9)	120 (61.9)	10 (5.2)	4 (2.1)	28 (14.4)	105 (54.1)	47 (24.2)	14 (7.2)
Sharing documents	44 (22.7)	122 (62.9)	26 (13.4)	2 (1.0)	16 (8.2)	95 (49.0)	60 (30.9)	23 (11.9)
Prerecorded videos	73 (37.6)	103 (53.1)	16 (8.2)	2 (1.0)	32 (16.5)	87 (44.8)	57 (29.4)	18 (9.3)
Online quizzes	113 (58.2)	74 (38.1)	5 (2.6)	2 (1.0)	39 (20.1)	95 (49.0)	51 (26.3)	9 (4.6)
Assignments	54 (27.8)	106 (54.6)	30 (15.5)	4 (2.1)	31 (16.0)	102 (52.6)	48 (24.7)	13 (6.7)
Online discussions	126 (64.9)	63 (32.5)	5 (2.6)	0 (0.0)	28 (14.4)	103 (53.1)	53 (27.3)	10 (5.2)
Chat	65 (33.5)	108 (55.7)	18 (9.3)	3 (1.5)	20 (10.3)	71 (36.6)	70 (36.1)	33 (17.0)

Table 4 presents the view of medical students about communication. The most of the students are satisfied regarding communication during online classes. They also agree that their queries are solved satisfactorily but students still held the opinion that discussions were better and more fruitful in the offline classroom rather than online. Most scholars also opinionated that they had better understanding and insight in face-to-face teaching conducted offline rather than online teaching. The students mandated that do not prefer to continue with online classes after resolving of lockdown and other concerns of the pandemic.

DISCUSSION

This study maps the developing landscape of online teaching in the time of COVID-19. Because of the second wave of COVID 19 pandemic and lockdown, every aspect of life is affected so medical education also. To fulfill this gap, online mode of medical education comes into action. Therefore, GDMC Dehradun also started online classes with the help of different methods such as Zoom app, Webex, Microsoft teams, and Google meet, and also different online assessments are conducted by WhatsApp, Email, Google form, etc.

Therefore, the need for an hour is to know whether online delivery of educational content is equally appropriate as offline delivery. The present survey concluded that the appropriateness of the online educational process is not as much as offline mode because students are partly satisfied by online education while access to the online educational process is good. Agarwal et al., found that online teaching is useful and many agreed that it could be added as a component of classroom learning in the future.[7]

Table 3: Response of participants related to feedback, accessibility of online educational process, and opinion regarding assessment (n=194)

Feedback of the online educational process				
Variables	**Not at all satisfied n (%)**	**Partly satisfied n (%)**	**Satisfied n (%)**	**More than satisfied n (%)**
Overall Impact	31 (16.0)	112 (57.7)	37 (19.1)	14 (7.2)
Student-teacher communication	32 (16.5)	123 (63.4)	37 (19.1)	2 (1.0)
Suitability of interaction methods	35 (18.0)	115 (59.3)	36 (18.6)	8 (4.1)
Aptness of formative assessment methods	31 (16.0)	113 (58.2)	38 (19.6)	12 (6.2)
Communication and cooperation between students	30 (15.5)	108 (55.7)	45 (23.2)	11 (5.7)
Active learning	39 (20.1)	115 (59.3)	34 (17.5)	6 (3.1)
Immediate feedback	34 (17.5)	104 (53.6)	44 (22.7)	12 (6.2)
Accessibility ease	49 (25.3)	102 (52.6)	12 (6.2))	31 (14.0)
Accessibility of the online educational process				
Variables	**Not at all satisfied n (%)**	**Partly satisfied n (%)**	**Satisfied n (%)**	**More than satisfied n (%)**
I did not have difficulty with video	40 (20.6)	51 (26.2)	58 (29.8)	45 (23.2)
I did not have any interruption of AV during class	55 (28.4)	52 (26.8)	68 (35.1)	19 (9.8)
I did not have difficulty with audio				
Assessment Methods				
Variables	**Not at all satisfied n (%)**	**Partly satisfied n (%)**	**Satisfied n (%)**	**More than satisfied n (%)**
Short and long questions answers	25 (12.9)	63 (32.4)	30 (15.6)	76 (39.2)
MCQs, in Google form	39 (20.2)	53 (27.2)	60 (30.6)	42 (21.6)

Table 4: Response of study participants regarding communication ease, quality of teaching, and overall opinion (n=194)

Variables	Not at all satisfied n (%)	Partly satisfied n (%)	Satisfied n (%)	More than satisfied n (%)
Communication ease				
Could freely communicate/had less inhibition during the presentation	58 (29.9)	52 (46.4)	60 (53.5)	24 (12.4)
All the teachers were speaking in a coordinated manner	32 (16.5)	42 (37.5)	68 (60.7)	52 (26.8)
All the students were speaking in a coordinated manner	43 (22.2)	45 (40.2)	68 (60.7)	38 (19.6)
My queries were answered satisfactorily	37 (19.1)	45 (40.2)	61 (54.4)	51 (26.3)
I felt that students and teachers expressed their views in a better way than in the physical class	69 (35.6)	30 (26.7)	64 (57.1)	31 (16.0)
Quality of teaching in an online class				
Seminars discussed better than physical class	71 (36.6)	40 (35.7)	48 (42.8)	35 (18.0)
I could understand better than classroom teaching	89 (45.8)	31 (15.9)	60 (30.9)	14 (7.2)
Overall Opinion about online Class				
Time was utilized fully	53 (27.3)	119 (61.3)	16 (8.2)	6 (3.1)
Prefer the same teaching way after resumption of offline classes	91 (46.9)	84 (43.3)	13 (6.7)	6 (3.1)
I will advise other students for same	83 (42.8)	92 (47.4)	13 (6.7)	6 (3.1)
Cyber safety is not a concern	80 (41.2)	89 (45.9)	12 (6.2)	13 (6.7)

Zhang et al., found that online distance learning is a good alternative during the COVID-19 pandemic wave, and it is an accepted manner of teaching.[11] The study by Rafi et al., projected light on questions such as duration of online classes, the requirement of online classes after resuming regular classes, need for online practical classes, reusability of online material, and role of college and university in conducting online classes.[12] John et al., found that attendance in online classes is lesser because of technical and nontechnical issues. They found that 48.6% of students opposed the idea of online classes as a part of the curriculum.[13]

Dost et al., found that overall students did not find online teaching to be engaging or enjoyable, with restricted opportunities to ask questions. They also discussed that internet connection, family distractions, the timing of tutorials, anxiety, and lack of space as barriers to effective online teaching.[14] The present study uncovered a clear favor among students for offline teaching. Elzainy et al., supported the finding of a shift toward the future implementation of more online medical courses but our study points toward student preference of offline teaching after COVID-19 wave has been dealt with.[15]

Students' experiences and feedbacks from this pandemic provide a breakthrough prospect for medical educators to refashion their delivery. Pre-recorded lectures with students learning at their own pace and providing teachers the opportunity to focus on conducting in-person sessions with real cases and practical learning can be way ahead.[16] This would encourage deep learning with an emphasis on "higher intellectual skills" like problem-solving and also distance educators from didactic teaching.[17] An analysis was attempted by authors taking into consideration various aspects of online medical education. The analysis has led to conclusions derived by authors which may be beneficial to come to conclusions for the future.

The rapid response of medical schools across the (Table 5) adapting to the new situation quickly and feedback has been documented. Medical curricula were slowly stirring a movement in the form of a more student-centered approach; however, the catalyst in the form of pandemic shifted it rapidly to online mode. Adaptations involved the provision of study materials online and online discussion of clinical cases, as well as access to virtual facilities like e-books and other digital facilities. Rapid feedback from students was attempted at all places as reflected in surveys conducted. Students actively reported issues with online teaching and assessment.

Table 5: Survey findings on online education from studies across the world

Author Date	Number of respondents	Findings
Dost et al., 2020	2721 students from 39 medical schools	• Less satisfaction with online teaching • Improvement in delivery of curriculum content is mandated • Innovative solutions problem-based learning suggested for efficient high-yielded teaching
Wang et al., 2021	995	• Students suggested diversity of content delivery • Infrastructure should be updated • Online medical education efficacy evaluation tools need to be developed
Stoehr et al., 2021	3286 medical students from 12 different countries	• Positive attitude of medical students toward online learning • Considerable discrepancy between students demands and curriculum delivery • COVID-19 pandemic is a catalyst for a new "online era" in medical education
Bączek et al., 2021	804	• E-learning is an influential learning tool • Preplanned strategy and a more active approach.
Baticulon et al., 2021	3670	• Several interrelated barriers as they tried to adapt to online learning • Difficulty in adjusting learning styles, burden of responsibilities at home, and poor communication • Implementing student-centered interventions
Khalil et al., 2020	60 medical students were recruited, and focused group discussions carried out	• Synchronized online classes were well-accepted • Promising potential for the future of medical education • Regular feedback of online education is required

Despite widespread quick transitions to online learning, hurdle of medical teachers' willingness and skills to use online platforms was an issue. Medical colleges provided online tutorials for faculty and students to use online learning platforms. Clinical faculty was working extra hours for COVID, which impaired learning of final year students exposed to insufficient clinical experience. Psychomotor and affective domain learning were most affected. This survey pointed toward high levels of stress among respondents' as the majority expressed a desire to return as soon as possible to pre-pandemic teaching.

Clear and strict rules from the government mentioning online teaching as an interim measure and providing clear instructions regarding assessment and clinical learning activities and providing a framework for each medical college to adapt accordingly. The decrees prompted a uniform way of adaptations. The forced adoption of online teaching fostered a desire in academia of exploring the use of various platforms to support active, student-centered methods such as the flipped classroom, online simulated patients, and virtual labs. There was a definite expansion of curricular topics with the inclusion of some topics that were initially underrepresented in the curriculum such as understanding of global health pandemics, training for using personal protection devices, and testing of viral diseases. The pandemic has also reported an increase in the use of telemedicine and online consultation giving students exceptional opportunities to take part in a process that was not well established especially in our country and see its nitty-gritty of implementation.

Impaired or severely limited communication between teacher-students, student peer groups have limited team learning. Role modeling and direct interaction between teacher-student have been disrupted. The online assessment was conducted but found to be difficult in terms of skill assessment and was not full proof concerning the prevention of cheating. Lack of relevant equipment and good internet connection was a concern. Online teaching was a threat to learning at the higher echelons of Millers triangle.

This shift to online education and subsequently to hybrid mode has opened avenues for the era of homo digitalis.[18]

There has been tremendous literature about the use of online modalities for student-centered learning during and post-pandemic. Disruption of Clinical teaching inward including non-COVID wards out of concern of student safety has led many medical schools to delve into alternative means like Virtual reality which simulates the clinical environment. Medical students gave positive feedback on the use of simulated clinical (Body Interact™).[19] Hybrid classroom has become a new normal.[20] Online medical education delivery of contents can be checked by evaluation tools specifically derived for the purpose.[21,22] The imminence of online learning is evident but must be integrated to traditional teaching with more active efforts and considering all potential barriers.[23,24]

Limitations of the study

The present study has a few limitations. This study represents the opinion of responding students of one medical college so response bias cannot be negated. The number of respondents is another limitation.

CONCLUSION

The present study has revealed the reluctance of medical students to continue online medical teaching. They agreed that offline teaching is more appropriate and conducive to deep learning than online teaching. The present scenario requires following of proper social distancing and COVID appropriate behavior, we hypothesize that a hybrid technique of teaching can be a possible way ahead. The use of online modules in medical education and our experiences with the present pandemic has ushered in a novel era of medical education. However, further rigorous studies are needed to test the viability of a hybrid technique of teaching as an appropriate way ahead in the future.

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JA- Study concept and design and drafting of manuscript; **SM-** Acquisition of data, analysis and interpretation of data, and statistical analysis; **AA-** Study concept and design; **MN-** Critical revision of the manuscript for important intellectual content; and **MKP-** Drafting of the manuscript administrative, technical, and material support

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