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Medical Undergraduate Students' Viewpoint on Online Learning During COVID-19 Pandemic

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Abstract

Introduction: The coronavirus pandemic constrained medical colleges to discontinue face-to-face learning activities and suddenly switch to an online learning model. Technology is making its way into medical education, also being advocated by the medical commission, though students' perception is still poorly understood. This study aimed to investigate the medical students' perspectives on online learning.

Methods: It was a cross-sectional, questionnaire-based study to assess the demographics, merits, demerits, recommendations, and suggestions for online learning by medical undergraduates. A combination of multiple-choice, Likert scale-based, and open-ended questions was used.

Results: The student-perceived merits of e-learning were flexibility in timings, convenience, self-directed learning approach, and prevention of pandemic spread. The demerits viewed were lack of personal interaction with teacher and batchmates, increased distractions, lack of high-speed internet, and less / no hands-on experience. The classroom teaching was the favoured teaching method (45.7%) and easy to comprehend (55.8%). The recommendations included: medical curriculum should not be completely e-learning based (84.1%), training for using online applications (51.4%), providing high-speed internet and apps with no time limit (83.7%), taking online tests (64.4%), student's feedback (75%), and frequent online demonstrations and simulations (64.9%). Overall, 52.4% of students' morale was positive towards e-learning. Students rated blended teaching as the preferred teaching method.

Conclusions: Medical students still prefer face-to-face learning and opted for blended learning over complete e-learning. Appropriate steps like training faculties, providing high-speed internet, taking formative tests, giving online demonstrations, involving simulations, and student feedback can improve e-learning quality.

Introduction

The spread of the COVID-19 pandemic led to a global closure of educational institutions.[1] According to the United Nations Educational, Scientific, and Cultural Organization (UNESCO), the crisis has affected more than 1.37 billion students (80% of the world's student population).[2]

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Thus, world-over education shifted to remote learning. Many institutions globally have witnessed an increase in online teaching.[2] Medical education was also disrupted due to the unprecedented conditions. Learning in a medical school has always been perceived as a traditional classroom teaching, with practical demonstration on the patients being the heart of it. Electronic (e)-learning in the fast-paced era of technology and advancement, is becoming an essential component of acquiring knowledge and skills.[3,4] With the advent of the COVID-19 pandemic, online learning was the only solution available to continue the incessant medical education.[5-7] Online learning or e-learning is the conduct of teaching and learning digitalized content via the internet and other technologically advanced means.[8]

E-learning is an important component of hybrid teaching in the new medical curriculum by the National Medical Council, India. COVID-19 pandemic allowed testing of the acceptance and reliability of e-learning. Also, it has given a chance to assess student's perception and their recommendations about online learning.[9] This may help us develop strategies to enhance the training imparted by the use of technology, specifically as medical education strives to involve students actively to promote perspicacious thinking and deep learning.

For the successful implementation of e-learning in medical education, it is crucial to understand technological, financial, institutional, educator, and student barriers.[10] There are multiple reasons for accepting online learning such as its ease, limberness, limited expenses, learner-centeredness, and better control over the learning atmosphere.[11] However, e-learning also has drawbacks like lack of student-teacher interaction, social detachment, internet issues, costly software, and poor power supply.[12] Therefore, this study was planned to assess the perspective of medical students towards e-learning that took place during the COVID-19 pandemic.

Methods

This descriptive cross-sectional study was conducted at a single centre among medical undergraduates in Uttar Pradesh, India over one month in February 2021. It was approved by the Institutional Ethics Committee of the Hind Institute of Medical Sciences, Barabanki. The study was done using a pre-designed questionnaire which was pilot-tested to ensure content validity on 30 students in the Department of Paediatrics who were excluded from the study population. The reliability of the questionnaire was calculated and Cronbach's alpha value turned out to be 0.803. The calculated sample size was 197 using a response distribution of 50%, a margin of error of 5%, and a confidence level of 95% from a purposive sample population of 400 students studying at the medical college. The actual study involved 208 medical undergraduates who consented to participate.

Google Forms questionnaire had five questions on demographics, nine questions on merits, thirteen questions on demerits, ten questions on recommendations and the last question was a qualitative question on student suggestions about e-learning, thereby comprising a total of 38 questions. Questions on merits and demerits of e-learning were to be responded to on a 5 - point Likert scale graded from 1 to 5 (1- strongly disagree, 2- disagree, 3 - neutral, 4 - agree, 5 - strongly agree). The students were given the questionnaire via email and informed consent was obtained within the process of answering the questionnaire. Students were reminded to participate every 10th day over one month via email. Responses collected over one month were analyzed. Statistical Package for the Social Sciences (SPSS) software version 20 was used to analyze the data by descriptive statistics i.e.; frequency and percentage were calculated.

Results

Out of 208 respondents who participated, 111 (53.4%) were female, 93 (44.7%) were in their final year, 136 (65.4%) had never attended any online class, 183 (88%) used mobile phones and 130 (62.5%) had intermediate computer skill (Table 1).

Table 1: Demographic Data of Respondents (n = 208)

Variables	Number (Percent)
Gender	
Male	97 (46.6)
Female	111 (53.4)
Year of Study	
First	29 (13.9)
Second	18 (8.7)
Third Part I	68 (32.7)
Third Part II	93 (44.7)
Ever attended any online class	
Yes	72 (34.6)
No	136 (65.4)
Gadget used mostly	
Laptops	10 (4.8)
Mobile	183 (88)
I pad	15 (7.2)
Rate of your computer skill	
Basic	62 (29.8)
Intermediate	130 (62.5)
Advanced	16 (7.7)

The respondents' major perspectives in favour of online learning were: prevented spread of pandemic (80.3%), teachers had authority over online sessions (68.3%),

recorded lectures can help in revision (63.9%), convenience (62.5%), and flexibility in timings (58.2%). (Figure 1).
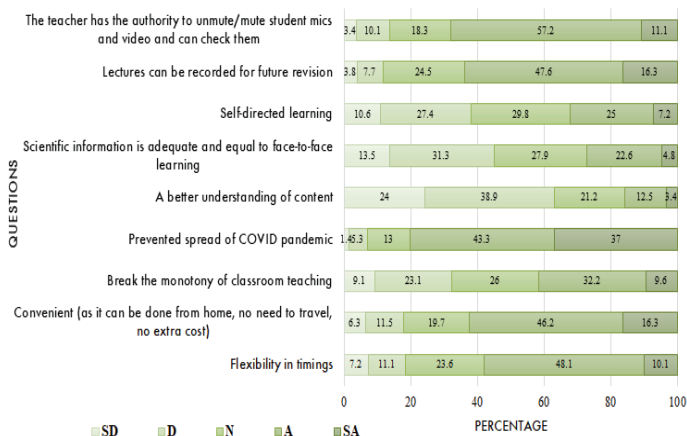

Figure 1: Respondents' Viewpoints on Merits of E-Learning (n=208) *

*SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly agree

The respondents' major viewpoints regarding the demerits of online learning were: faculty needed a stable high-speed internet connection (85.6%), lack of high-speed internet (82.7%), lack of personal interaction with teacher (80.3%), less social interaction with batchmates and less group discussion (78.4%), and difficulty to initiate the teaching as faculties were new to use of online teaching platforms (71.7%). (Figure 2).
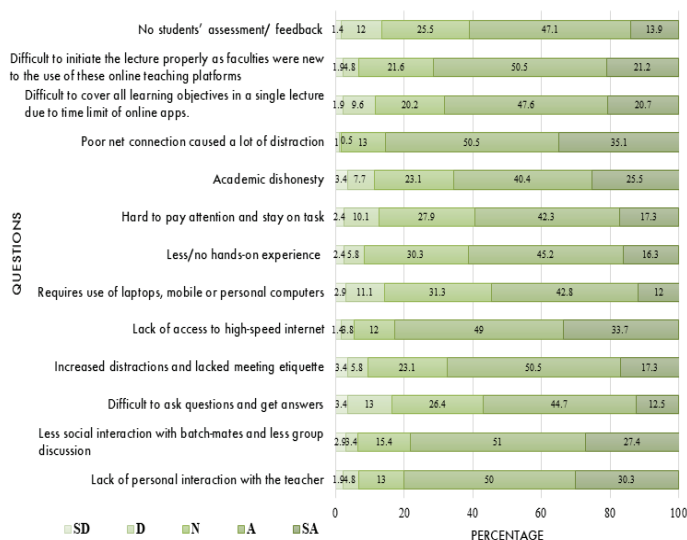

Figure 2: Respondents' Viewpoints on Demerits of E-Learning (n = 208) *

*SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly agree

In present study, the preferred teaching mode recommended by respondents was classroom teaching (45.7%) and 55.8% believed that it is easy to comprehend. Majority (84.1%) believed that MBBS curriculum should not be completely e-learning based. Other recommendations were: providing stable high-speed internet connection and apps with no time limit (83.7%), student's feedback after online lectures (75%), and frequent online demonstrations and simulations (64.9%) (Table 2).

Table 2: Respondents' Recommendations for E-Learning (N = 208)

Question	No (Percentage)
Preferred teaching method 　Classroom teaching 　Online teaching 　Blended teaching	 95 (45.7) 21 (10.1) 92 (44.2)
The teaching method easy to comprehend 　Classroom teaching 　Online teaching 　Blended teaching	 116 (55.8) 28 (13.5) 64 (30.8)
e-learning should be fully incorporated in MBBS curriculum 　Yes 　No	 33 (15.9) 175 (84.1)
Training of faculty and students for online applications 　Yes 　No	 107 (51.4) 101 (48.6)
Provide stable high-speed internet connection and apps with no time limit 　Yes 　No	 174 (83.7) 34 (16.3)
Taking online tests weekly from students on studied topics 　Yes 　No	 134 (64.4) 74 (35.6)
Student's feedback after online lectures 　Yes 　No	 156 (75.0) 52 (25.0)
Frequent online demonstrations and simulations 　Yes 　No	 135 (64.9) 73 (35.1)
Impact of online learning on your morale 　Positive 　Negative	 109 (52.4) 99 (47.6)
Teaching method favoured in these prevailing pandemic conditions 　Classroom teaching 　Online teaching 　Blended teaching	 48 (23.1) 51 (24.5) 109 (52.4)

Four main themes emerged from a thematic analysis of the qualitative question on student suggestions about e-learning: educational impact, problems encountered, time management, and future preferences (Table 3). Respondents mentioned that they had difficulty with methodological, content perception, technical, and behavioural issues during online sessions. They recommended classroom teaching as the best method (45.7%), especially for practical and clinical demonstrations. They accepted online learning as a risk mitigation strategy during the COVID-19 pandemic but its utility in patient examination or specimen identification was questionable. Students suggested a blended mode (52.4%) with lectures acceptable as interactive e-learning, supported with formative assessment by multiple-choice questions, while the practical classes to be physical.

Table 3: Thematic Matrix of Respondents' Feedback and Suggestions (N = 208)

	Themes	Subthemes	Description	Examples
1.	Educational impact	Understanding of content	Educational advancement as a result of improved information understanding	• Online lectures can be recorded and used later for revision and review. • Online teaching sessions are good, personally for me creating a thorough concept for the topic.
		Content perception problems	Understanding issues with information delivered online due to learners' varying demands for content reception	• Many of the lectures, mainly those containing clinical signs, were difficult for me to understand because they were not made obvious in the online sessions.
2.	Problems encountered	Technical challenges	Problems resulting from technological issues with internet connectivity and inadequate use of online tools	• Poor internet connection and problems using communication software were the main issues. • Sometimes due to internet problems we students used to get disconnected.
		Methodological difficulties	Delivery of the content has problems with quality assurance and online learning implementation problems	• There were multiple classes timetabled in one day and I did not have sufficient time to adequately revise them.
		Behavioural issues	Depending on a person's personality, there may be obstacles to implementing online learning	• I should indeed admit that although getting online classes during the covid pandemic was helpful, they are not ideal for me because I learn best visually and physically. • Online lectures never had a positive impact on me. In fact, they were just for the namesake teaching method.
3.	Time management	Time benefits	Improved time management and efficiency as a result of online learning	• I had a great time studying during the online sessions, and my time management improved. • It is more time saver and compatible.
		Time Challenges	Problems faced due to less time during online classes	• Explaining well with more time is required during online classes. • Time limit of communication software caused distractions.
4.	Future preferences	Students' future suggestions	Students' preferred learning modes for the upcoming academic year	• Mixed format of teaching will provide greater results and student-teacher interaction. • Regular assessment tests should be done.

Discussion

As the COVID-19 pandemic has affected every aspect of life, medical education does not remain untouched. The shift to online learning gave a chance to assess its feasibility and acceptability in medical schools. The present study was an effort

to estimate students' outlook on the new learning mode. Many (44.2%) students recommended a blended approach and are convinced that medical teaching cannot be done without actual physical interaction with the patients and specimens.

The majority (88%) of the students in the present study used mobiles for attending online classes similar to the 76% usage reported by Abbasi et al.[13] Most of our students had never attended any online class before the COVID -19 pandemic and had intermediate (62.5%) computer and internet skills, in contrast, Gaur et al reported that 94% of students had an experience of online classes and all had an average level of computer knowledge.[14]

Ibrahim et al found that 66.4% of students agreed that there was on-time delivery of the course materials, and 68.2% agreed that the learning contents were attractive & interactive.[15] Khan et al reported that 73.4% agreed to ease and quick share of educational material, 61.3% agreed to flexibility in time and space, and 55.4% agreed to the accommodative nature of the e-learning platform.[16] Mukhtar et al found that online classes reduced traveling and other expenses, and encouraged student-centeredness so they can conveniently assess teaching material asynchronously to become self-directed learners.[17] Interactivity can be introduced into lectures by using multiple-choice questions, crossword puzzles, and problem-based questions, and has been proved to increase the learning experience.[18] Similar merits of e-learning were experienced by our study group i.e., pandemic spread mitigation (80.3%), the teacher had control over the sessions (68.3%), recorded lectures helpful in revision (63.9%), convenience (62.5%), and flexibility in timings (58.2%).

Mukhtar et al found that during online classes, students were unable to learn practical and clinical work, had a limited attention span, were resource-intensive, engaged in academic dishonesty, and teachers were unable to assess students due to a lack of immediate feedback.[17] Baticulon et al reported that during e-learning there were technological barriers like lack of devices or limited access due to gadget sharing, slow internet access, lack of technical skills, online platform issues, and poor communication between students and teachers with very limited opportunities to interact with peers.[19] Our study group also reflected analogous demerits of e-learning i.e., faculty (85.6%), students need high-speed internet (82.7%), lack of student-teacher interaction (80.3%), less group discussion with batchmates (78.4%), and initial problems being naïve to the online teaching platforms (71.7%).

Leo Ng et al reported that students valued face-to-face practical classes as a way to learn and socialize with fellow students and teachers to keep them engaged and motivated to learn and suggested curriculum changes geared toward a more blended approach to learning which may include

the use of online lectures instead of face-to-face lectures, as well as the use of online resources to supplement the learning of practical skills.[20] This concurs with the idea of students (84.1%) in our study group that medical education cannot be done completely in an e-learning model.

Mukhtar et al recommended the need to train faculty to use online applications, increase interactivities with students, incorporate case-based learning, integrate proper assessment, and purchase package for the zoom app with no time limit.[17] Our students gave similar recommendations along with the use of simulation-based teaching, which was helpful in understanding concepts, skill improvement, and teamwork.[21] Simulation-based learning can have a transformational effect on the viewpoint of the student, encouraging deep learning and reflection.[22]

In this study, online learning had a negative impact on 47.6% of students' morale which was comparable to the study by Robbins et al.[23] This could be because of lack of socialization, missing peers, improper time tables, and failure to examine actual patients or specimens. Attitude and communication learned by actually dealing with patients and skills learned by doing a procedure cannot be equated to viewing the same during an online class. Medical students affirm the words of William Osler "To study the phenomena of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all."[24]

Pei et al reported that there is no evidence that offline learning is more effective and, online learning has advantages in terms of improving undergraduates' knowledge and skills and thus can be considered a potential method in undergraduate medical teaching.[25] Mahrlamova et al concluded that blended learning is a powerful technique of learning in today's scenario.[26] Our study group valued blended teaching (52.4%) and advocated that e-learning has its advantages and can be included in lectures, demonstrations, and simulations but for practical on patients and specimens, they favoured traditional classroom teaching.

The key strength of this study was the analysis of students' suggestions by a qualitative answer which allowed them to express their perspectives in their own words, giving insight about their way of interpreting the online learning experience. As our study was limited to a single center only, generalization of results may not be possible. Further evaluation of online learning by a multicentric approach is required to assess its feasibility in medical education.

Conclusions

Medical students prefer face-to-face learning over complete e-learning. Students recognize the benefits of e-learning and favour hybrid learning pattern. The primary constraint

in the COVID-19 era was interpersonal communication. E-learning began as 'emergency remote learning,' and a few drawbacks noted can be resolved with additional investments. There is a need to train faculty on the use of online modalities and creating lesson plans with less cognitive load and more interactivity. Appropriate steps like providing high-speed internet connection, employing formative assessment, giving frequent online demonstrations, use of simulations, and obtaining student feedback can improve the quality of online teaching to facilitate students' learning.

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