Lived experiences of medical students of online learning: lessons for adopting virtual learning in medical education

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Abstract

Background The COVID 19 lockdown created a shift in medical education from the traditional physical classroom to online learning.

Objectives To explore the lived experiences of students in various years of medical education attending a medical college in Chennai, India.

Methods In this qualitative exploration of lived experiences we conducted 4 focus group discussions among students of the four years in the medical college with the help of a checklist. We recorded the interviews, transcribed them and performed a thematic content analysis.

Results There was a gendered impact of the lockdown on the online learning experiences with women students finding it challenging to attend classes balancing their gender roles of performing household chores. Online learning offered some advantages in the form of increased participation and engagement due to the partial anonymity. The greatest disadvantage of online learning was lack of clinical learning experience. The students resorted to fabricating case studies for discussion, which some students found useful and some commented that it can never replace real life clinical discussions. A generational gap between adoption of technology between the senior professors and the students hampered the online learning. Online assessments were challenging, and many students resorted to cheating in these exams.

Conclusions Though online learning offers several advantages, it has serious limitations in offering the clinical learning experience. While planning adoption of online learning into routine medical education adequate time must be set aside for real life clinical exposure in addition to the online lectures and demonstrations for conceptual understanding.

Keywords Online learning, COVID 19, Lockdown, Lived experiences, Medical education, Student experiences

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Introduction

The COVID 19 pandemic had a serious impact on medical education. Most countriesimposed lockdowns during the pandemic to limit the transmission of infection. This confined medical students to their homes or hostels. There was a need to shift from the traditional classroom and bedside teaching modality to a virtual space. Online classes became the norm, for both theoretical and clinical teaching [1].

Several studies conducted among students and teachers at medical colleges in India have explored the experiences, perceptions and consequences of shifting from the traditional to the virtual mode of education during the pandemic. Most studies reported that internet connectivity issues greatly hampered the smooth learning experience [2–5]. Many students living in low resource settings, did not have adequate space and privacy to engage in the online classes [2, 3]. The timings of the classes were haphazard and often classes extended beyond their scheduled duration. Many studies also reported that there were disturbances in the classes due to lack of virtual learning etiquette among the students as well as teachers [5, 6].

The virtual mode of medical education offers several advantages and opportunities. Teaching theoretical concepts and ideas online, can free up substantial time for students to engage actively in clinical learning when they come for physical classes in the college. The virtual mode also throws open the opportunity for cross learning across institutional, regional and even national borders. They are also immensely advantageous for offering continuing medical education programs for the busy practicing clinician [7]. Therefore, there is a need to understand the nuances of the online learning experience.

Despite the presence of several studies on perceptions and opinions on online learning, there is a lack of evidence on the details of the lived experiences of going through the lockdown and online classes among the students. The limitation of such perception surveys is that they do not explore the deeper meanings and experiences. Though these studies point out that the online learning experience was less than optimal for the students, it does not go into the "why" and "how" of the matter. The medical student is the key stakeholder in the medical education enterprise and their lived experiences provide important insights into designing and integrating online learning into routine medical curriculum.

With this in the background, we embarked on a qualitative study to explore the lived experiences of medical students in various years of education attending a medical college in Chennai, India.

Methods

Qualitative approach and research design

This qualitative study explored the experiences of medical students using a lived experiences research approach. We conducted focus group discussions among 4 batches of students who were studying in the college at the time of the study with 6 participants in each group.

Theoretical underpinning

While there is substantial literature on perceptions of Indian medical students about the online learning experience during COVID 19, there is a dearth of literature and theoretical frameworks on lived experiences of the online learning. Therefore, we were not informed by any theoretical frameworks for our study. From prior experience of the researchers, we knew that there were technical glitches in the online learning and there was a compromise in clinical learning opportunities. Therefore, we focused on these two dimensions and conducted an open-ended exploration of the lived experiences. As we conducted an iterative analysis of the discussions throughout the research, we identified other papers and research in support of our important findings, which we report in our discussion section.

Researcher characteristics and reflexivity

The research team who conducted the FGDs included 2 members – a female faculty member holding a doctoral degree in Community Medicine who is trained in qualitative methods and a male student member (final year medical student). Both were part of undergraduate medical training prior to and during the pandemic. The research team belonged to the same institution where the study was conducted. The faculty member was the teacher to the participants in the students' focus groups. The student member was a class-mate or a senior in relation to the participants. Therefore both the interviewers had prior rapport with the participants. It is likely that the responses of the participants was influenced by the fact that one of the interviewers was their teacher.

Context

The institution where the study was conducted is a government-run, tertiary care centre with around 400 faculty and 1,250 undergraduate medical students. During the pandemic, undergraduate medical training has been suspended intermittently since April 2020. Classroom lectures and clinical rotations were replaced by virtual modalities. From the experience of the past two years, the trainers and trainees have familiarised themselves with the newer modalities of medical training. This research was conducted in early 2023, after classroom classes had resumed, yet the students still vividly remembered their virtual learning experiences.

The COVID-19 pandemic severely impacted Chennai, overwhelming its healthcare system and causing widespread disruption. The institution in which the study was conducted was made the higher referral centre for dealing with Covid. All the teaching faculty were involved in providing Covid care throughout the pandemic. The city experienced multiple waves of the virus, with lockdowns and intermittent restrictions spanning from March 2020 to January 2022.

Sampling strategy

ER and TS are students in the same medical college. They identified volunteers from their classmates and their junior batches for participating in the study. They used the following criteria for selecting the volunteers – those who are articulate, those who had unique experiences and challenges in using online learning, and those who could talk about their experiences clearly. Six students from each year of medical college, first, second, third and internship year participated. Of these 24 students, 12 were men,12 women, 16 belonged to an urban background and 8 rural, 14 resided in the medical college hostel and 10 at their homes.

Data collection methods

We conducted focus group discussions among the participants which last between 45 min to an hour and 30 min. The FGDs were conducted in the college campus after class hours, based on the convenience of the students. Of the 4 FGDs, 3 were conducted by SS and notes taken by ER. One FGD was conducted by ER and notes taken by SS. Apart from the participants and moderators, there are no other people in the room during the discussions. We used semi-structured interview guides with open-ended questions. The interview guide was developed by the research team for the purpose of the study.(Supplementary material). The interview guide was developed based on literature review and prior experiences of the researchers with online learning. The categories included in the interview guides are – academic response, clinical training, barriers and enablers, health and psychological aspects and overall perceived impact. We did not particularly look for data saturation, as we believed that a representative sample of students from all the batches in the college would reflect all the lived experiences.

Data analysis

The group discussions were audio recorded, pseudonymised and transcribed verbatim in the Word processing software. All coding and analysis was performed using the Microsoft Excel spreadsheets where each FGD was assigned a code number, and codable data units were separated into the various cells in the spreadsheet. Each of these data units were assigned a specific code and this was linked to the FGD code number and the participant number. The transcripts and field notes were read repeatedly and assigned with initial codes. ER, TS and SS initially read and coded all the data. VG read all the transcripts and independently coded the data. All the codes were read and compiled and meaningful themes were derived. Any differences in coding and analysis was reconciled by discussions and consensus. Data collection and coding were performed simultaneously in an iterative manner to find new variants of information.

Trustworthiness

At the end of each FGD, the moderator summarized the discussion and confirmed for its validity. Audit trails were maintained. Both verbal and non-verbal interaction of the participants were documented. Field notes were made during the discussions by the moderator.

Ethical considerations

Approval for the study was obtained from the Institutional Ethical Committee (IEC) of Madras Medical College(Approval No. 08052022), before beginning the study. Informed written consent was obtained from the participants and permission taken for audio recording of the discussions. Consent was also obtained to use excerpts from the transcripts in the form of quotes. To preserve the participants' confidentiality, their anonymity was maintained throughout the analysis and reporting process.

Results

The findings can be broadly reported under the headings of overall impact of pandemic on medical education, advantages and disadvantages of the lockdown, advantages and disadvantages of online learning, strategies adopted by the teachers to enhance online learning experiences, strategies adopted by the students and student's opinions on what could have been better with respect to online learning.

Overall impact on medical education

Students of the final year of their course during the study were in the pre-final year when the lockdown and online learning happened. They had a broad overview of the impact of the lockdown and online classes in comparison to their prior experiences of offline learning.

"Usually, the first year of medical college is completely spent in getting used to the transition between school to college education. Then second year is usually referred to as the 'honeymoon' period when we relax and enjoy college life. It is during the third and final year that we usually start studying seriously. But the pandemic struck during our third year and

we went on a lockdown. Online classes started. We never got the opportunity to start studying medicine seriously." – a final year medical student.

They explained the various emotions that they went through, an initial phase of excitement and happiness, followed by adjusting to a new online learning method, through frustration and uncertainty of prolonged lockdown and finally a sense of dissatisfaction and non-productive learning. Students who had just entered the first year during the lockdown did not have a frame of reference to reflect on. But they expressed a sense of frustration, anxiety and uncertainty.

"The uncertainty was worse than taking the NEET exam 100 times over and over again and waiting for the results" – a second-year medical student.

They compared the uncertainty to writing the National Eligibility and Entrance Test (NEET) which is the qualifying examination for getting into medical college. It is a highly competitive exam. They compared the uncertainty of waiting for colleges to open to taking that exam again and again and waiting for the results.

Gendered impact of lockdown and staying at home

The experiences of staying at home during the lockdown for prolonged period of time was gendered in nature. The women students felt that being at home compelled them to participate in household chores, thus distracting them from concentrating in classes and learning. In some cases, the women students felt that they had misunderstandings within the family because their parents thought that they were using the online classes as an excuse to avoid doing household chores.

"There were too many distractions at home. I had to help in cooking and cleaning chores at home. Sometimes I would have to keep my phone next to my stove in the kitchen and listen to the online lecture as I am cooking." – a third-year lady medical student.

The narratives of some of the students belonging to upper socio-economic class and male medical students revealed that staying at home led to unhealthy lifestyles. They reported spending too much time watching television and web series, playing video games and eating unhealthy junk food. They also reported lacking any kind of physical exercises.

"As we stayed at home, I was watching too much series and sitcoms. I was paying a lot of games." – a second-year male medical student.

"I gained a lot of weight due to overeating of junk food and lack of physical exercises" – a second-year female medical student.

Being locked down in their homes with no external interactions made them lose their motivation to study.

"Being shut down within the house was highly demotivating. I lost my motivation to study" – third-year male medical student.

In stark contrast to this narrative, some upper-class lady students reported that staying at home was very advantageous. They reported that it reduced their need to travel to college, gave them more time with their family, helped them sit in a comfortable environment at home and concentrate on studies, and develop a healthy routine including good diet, sleep and exercises.

"We would stay at home, have the AC running and have a snack in our hand as we attended the classes. This was very comfortable." – a third-year lady medical student.
"Staying at home helped us avoid the tiring journey all the way to college just to attend one hour class." – a second-year lady medical student.
"I liked staying at home. It gave me more close bonding time with my family." – first year lady medical student.

Challenges and advantages of online classes
Logistic challenges

The greatest challenges of online classes reported by the students were logistic issues. When the pandemic first started, the institution and households were not prepared for internet-based learning. The most important challenge was network connectivity issues. Many students struggled with internet connectivity.

"The internet connectivity would be very poor in the hostel. We had to go around the building to look for the best spot to get network. Even after searching all over, we would not get network and miss the entire class." – second year medical student.
"Sometimes five members in my house would use the WiFi. The bandwidth would not accommodate this. Sometimes the electricity supply would go and we all would get disconnected. After that, my father bought an inverter exclusively for the WiFi modem" – second year medical student.

The students also reported that even if they managed to get proper network connectivity, the institution did not

have proper network and so their teacher's connection would be patchy. They also reported that many of their older, more experienced teachers were not technology savvy and so faced challenges in setting up and teaching online.

> *"Many times, our senior professors who are not technology savvy would struggle with online teaching. They would start talking with the microphone on mute. Then we would ask them to unmute. Then they would repeatedly ask us to confirm if we can hear them. That would delay the starting of the class." – a third-year medical student.*

These technical glitches also led to prolonged classes which would extend beyond 1 h and sometimes even up to 2 h. This would lead to fatigue.

Many students used the mobile phone for attending online classes. It was found to be inconvenient due to challenges of holding the mobile in a stable position for prolonged time.

> *"I had to figure out a way to hold the mobile and listen to the class. Holding it in the hand for prolonged time made it uncomfortable. So, I had to set up my table such that I can place it on the table and attend the class." – third year medical student.*

Scheduling of the online lectures was also haphazard and challenging to follow.

> *"Fortunately, we had a representative who would meticulously schedule the classes and post them on our social media communication group. If not for that the scheduling would have gone haywire. Sometimes the classes would be in the morning, sometimes in the afternoon and sometimes at night. It was very confusing" – a second-year medical student.*

Lack of clinical learning

Clinical learning is the core of medical education. The students perceived the lack of good clinical learning opportunities during the online classes. They resorted to watching videos online and reading from website and textbooks to learn clinical medicine. But they felt this to be highly disadvantageous.

> *"The online videos depict perfect situations in which the physical examination is performed. In real life there is a lot of disturbance and distraction. Performing the same physical examination in real life will be difficult. We do not get the real-life experi-*

ence by watching online videos" – a final year medical student.

> *"The online videos and textbooks are by foreign authors. They perform clinical examination on fair skinned foreigners. A clinical sign like a rash is very clearly seen in fair skin. In typical dark complexioned Indian patients such rashes are very difficult to identify. Unless we see patients in the hospital, we cannot learn properly." – a final year medical student.*

The students complained of a lack of clinical experience and feeling unprepared to practice medicine. The students who were in their final year during the lockdown said that they touched a patient for the first time during their final university examination. They also said that they knew to describe how to do a clinical examination, but never knew how to perform it.

> *"I touched a patient for the first time during the University clinical examination. I did not even know how to place my hands on the abdomen to palpate it." – a final year medical student.*
> *"I had to auscultate a child during my pediatrics exam. I was placing the stethoscope on the chest of the child. The child started crying and pushed away the stethoscope. I did not know what to do. The examiner was watching me and must have been wondering what I am going to do…." – a final year medical student.*

The students also felt that they lacked communication skills with patients as most of the learning was theoretical. They never got to interact with real life patients.

> *"We lacked experience of taking history and interacting with patients. Sometimes, I don't even know what words to use to take certain history from patients. These things we can never learn from online videos." – a final year medical student.*

Many students reported that they fabricated fictional cases for presentation in discussions. Some felt that such fabrication was helpful for them. Others felt that it was not at all a good practice.

> *"Online classes has helped us learn how to fabricate cases. This is good because we can now present something even if there is no patient available to be seen." – a third-year medical student.*
> *"Many students would just take an old record from a senior and take the details and present the case as a new one. This is not at all helpful because it never*

helps us understand the details of the patient" – a third-year medical student.

Lack of an enabling learning ecosystem

Students mentioned that certain good practices that existed during offline learning were lost during online learning. This greatly disturbed the learning experience.

"The habit of taking notes during a class that existed during offline learning got lost during online learning. This greatly reduced the level of understanding" – a final year medical student.

The online learning led to passing out of previously typed notes and PowerPoint presentations. This made learning passive and non-participative. Moreover, the students felt that the greatest learning experience comes from bonding with the department, the faculty and seniors in the college. This was lacking during online learning.

"Bonding with the department is very important. During online classes we don't have any opportunity to visit the department and bond with the faculty. We would have favourite faculty in the departments. This was not possible." – a third-year medical student.
"We lost the motivation provided by seniors and post graduate students in the departments" – a third-year medical student.

Ineffective teaching learning methods

The students felt that the teaching-learning methods that were used predominantly during the online classes were ineffective. They did not engage them actively in the learning process.

"The teachers would display a PowerPoint presentation on the screen and read it out line by line. We would be so bored and go to sleep. This was there even before online teaching, but became worse during online teaching" – a second year medical student.

The students felt that the teachers who were deeply involved in treating patients with COVID 19 day in and day out would use only COVID 19 examples to teach and this made it boring for them.

"They would use COVID 19 examples to teach everything. Already the news and media were full of information about COVID 19. We did not want

more of that from the classes." – a third-year medical student.

Ineffective evaluation methods

Evaluations were done merely as formalities. In fact, many students mentioned that the evaluations were not taken seriously and the marks they obtained in these evaluations were not counted for their formative internal assessment. They also mentioned that there was no clinical assessment.

"There was no clinical examination. They only conducted theory examinations." – a second-year medical student.
"Most of the tests would be multiple choice type questions. It was easy to answer. It would be an open book test." – a second-year medical student.
"One department made us write lengthy essays all typed in the online platform. Those of us who are not fast in typing found it difficult" – a third-year medical student.

Advantages of online learning

Despite these challenges in online classes, there were several advantages as well. The students felt that the online classes helped them understand the importance and need for self-directed learning and life-long learning.

"The online classes helped us learn the importance of self-learning" – a final year medical student.

The anonymity offered by the online class platform helped many students open and actively participate and interact in classes.

"Many students who would be terrified to speak up in an offline class, gathered the courage and answered questions in the online class. This is because they would not have to stand in front of everyone" – a second-year medical student.
"Asking doubts and questions is much easier in an online class. We must just unmute ourselves and ask. This made us more actively participate in the class." – a third-year medical student.

The other great advantage of online classes was the cross-learning opportunities from teachers of other institutions and even international teachers. The online platform threw open such opportunities.

"National and international conferences opened to all. We could attend even classes by faculty and pro-

fessors of other institutions and other countries" – a second-year medical student.

Integrated teaching is when faculty from different departments came together to teach different dimensions of the same topic. Online teaching facilitated integrated teaching. Students felt that they could get diverse perspectives of senior experiences teachers on topics because of the online teaching facility.

"Online integrated teaching was easier and better because different faculty from different departments, seniors and juniors would participate and share knowledge." – first year medical student.

Strategies adopted by teachers to improve the online learning experience

The students observed that their teachers adopted some strategies to improve the quality of the online learning experience. They requested students living close to the hospital and day scholar students to come to the ward, examine patients and then present them in the online class. This way even those students living away in distant cities and towns got an opportunity to experience clinical teaching online. The teachers used mannequins to demonstrate clinical examination and clinical procedures.

"Our seniors and post graduate students took special interest and taught classes for us online. These classes were extremely useful." – a first-year medical student.

To keep the students interested and engaged they made the students present seminars and conducted interesting quizzes on various topics. They also conducted small group discussions online with 20–30 students in each batch and one facilitator. Since many students felt that online classes were boring and as many of them disengaged from the class, they would adopt interesting strategies to keep the students interested.

"They would randomly call out a roll number and ask that student a question related to the topic they were teaching. If the student answers that correctly they mark the student as present. Otherwise, they mark them as absent. This makes all students listen to the classes" – a third-year medical student.

Many senior professors bought digital equipment, tablets, laptops and high-end mobile phones to facilitate online teaching. This was a great advantage as they started becoming technology savvy and started updating themselves. Some faculty even conducted online classes

for communication skills by making the students do role-plays.

"They made us do role play to enact a doctor-patient communication scenario." – first year medical student.

Strategies adopted by students to cope with challenges of online learning

Some students bought tablets with a stylus to take notes and attend classes. They felt that this helped them attend classes and take notes in the same device. Some students subscribed to online coaching classes and attended the lectures and videos of these coaching classes. They found this very useful, sometimes more useful than their online class lectures.

"I used the 3D dissection application for anatomy, and it was very useful. It was better than the PowerPoint presentations shown in anatomy classes." – a first-year medical student.

The students preferred recorded lectures to live online classes. This was because they could vary the pace of the lecture, pause the lecture and engage with the thoughts and then attend them at any time of their convenience.

"Students would log in to the online class, stay online for about 5mins and then exit. They would be marked as present in the attendance. Then they would record the lecture and listen to it at their own time in 2X speed." – a second-year medical student.

Some students overcame the limitations of lack of clinical exposure by trying to shadow local clinicians and volunteering in COVID 19 treatment facilities near their homes.

"We volunteered in the COVID 19 treatment centres, and we learned a lot from there." – a third year medical student.
"I asked my parents for permission to go and sit with our family paediatrician and see patients. But because of COVID 19, they never permitted me to do that." – a third-year medical student.

Some students resorted to cheating practices in online evaluations and exams.

"Though they asked us to keep our camera on while writing the exams, there are still ways in which we can cheat in the exam." – a second-year medical student.

"Students cheated on online viva evaluations. They would take the viva on behalf of their friends. If the faculty did now know you by face, then you could do that. Or else you could wear a mask and do it." – a first-year medical student.

"Some students called their friends on the phone during the viva exam, and the friend would listen to the question and answer the questions, they would just repeat the answers" – a first-year medical student.

Medical students' suggestions for improving the online learning experience

The students gave some interesting suggestions for improving the online learning experience. They suggested that the online lectures should be conducted in small batches. That way all the participants could actively engage and participate in the discussions. If the lectures are for large groups, they should introduce periodic break out small groups to discuss, debrief and then regroup to continue the class. Rather than forcing the students to attend live online lectures, the professors should record their lectures with clinical demonstrations and post them online. Though there are several online video lectures, these recorded lectures by their professors gave the lectures a sense of authenticity. The students also suggested that recordings of heart and lung sounds could be shared and discussed in the online clinical demonstrations.

Discussion

Several studies have documented the challenges and difficulties of online medical education during COVID 19 times. [2–6] The commonly reported challenges include under-preparedness for technology enhanced teaching, challenges in time management, behavioral challenges and challenges in digital infrastructure. [2–6] Several studies have focused on the benefits and challenges. However, there are very few studies which have looked at the overall experiences of online learning during COVID 19. This study explored these experiences among medical students of the 4 different batches in a medical college in Chennai, India through focus group discussions. The study found that the students faced a stressful period of uncertainty due to the prolonged lockdown. There was a gendered impact of the lockdown, with women complaining of excessive household chores preventing them from attending the online classes. The men reported binge watching television, playing video games and adopting unhealthy life styles due to lockdown. The students reported several logistic challenges in the online classes with network connectivity issues, technical glitches and lack of preparedness of the faculty to the online teaching mode. They felt that clinical teaching

was severely compromised. They said that they had to use fictional cases for discussion and learning. The learning ecosystem was very different, and the students felt very much distanced from their teachers. On the other hand, some students also felt that the online classes increased their confidence and capability to actively engage and interact with the classes due to the anonymity. They preferred recorded lectures to live online sessions as it helped them play it at varying paces, pause at strategic points and engage with the lecture at their own pace. In the following paragraphs we shall discuss these issues in detail.

We analyzed the experiences of the students in two separate categories, experiences of the lockdown and experiences of the online learning method. Uncertainty of the duration of lockdown, feeling of non-productive learning experience and anxieties about not being able to learn properly were common among the students. A previous study documented the uncertainties faced by students during the COVID 19 lockdown. The students reported a sense of loss of purpose, lack of motivation and uncertainty [8]. A similar uncertainty and anxiety was observed in this study. Since the lockdown came as a sudden shock, it disturbed their plans for the 5.5 years of medical college.

One of the key findings of this study was the gendered impact of the lockdown on the lives of the medical students. Previous studies have documented that gender roles of women and men within the household heavily impacted on the work burden on women [9]. This was also seen among lady medical students who were expected to share the burden of the household chores with the other women in the house. On the other hand, the male students expressed having a lot of free time for watching television series and playing video games. A study from Morocco showed that the COVID 19 lockdown led to widening of the gender disparity in education [10]. In our study the stark gender differences in narratives about being locked down at home re-emphasized the importance of gender-based discrimination at households and its impact on medical education.

Several previous studies from India which looked at the perceptions and experiences of medical students on online learning reported challenges in internet connectivity, technical glitches in the online learning platforms, and irregular timings of the online classes [2–6, 11–17]. This study had similar findings. In addition, the students in this study also reported the generational differences in adaptation to internet and online learning technologies between the senior teachers and the students. A previous study of experiences of online learning showed that students tend to derive better online learning experiences from teachers who adapted to digital technology better [18]. Thus, generational differences in adapting to digital

learning has a substantial impact on the online learning experience.

One of the major findings of our study was that the students suffered from a critical loss in clinical learning exposure. The various manifestations of this compromise in medical education was described by the students. The drastic change in the clinical learning environment from physical to virtual greatly compromised human connections, contextual cues, and the skills that are typically developed by direct patient interactions such as empathy, compassion and sensitive communication [19]. There is in addition a social learning environment in medical education comprising of networking and co-learning with other students, senior students and postgraduates. This contributes greatly to clinical learning. This was also compromised during the COVID 19 pandemic [19]. It was also reported in this study.

Another significant finding of this study is that many students used fictional and fabricated cases for their clinical discussions. Some students felt this to be advantageous because it gave them a focus to discuss clinical material, whereas others felt it was not the same as seeing a real patient and discussing about them. While there is some evidence to show that simulation-based learning is useful in developing clinical skills, there is no evidence to support the effectiveness of fictional or fabricated case studies [20]. The anonymity offered by online learning platforms encouraged participation by the students. This was reported in a previous study of school education using a 'voice only' learning platform. The partial anonymity offered by the platform enhanced active participation by the students [21].

To our best knowledge this is one of the few in depth qualitative explorations of students' perceptions and experiences of online learning during COVID 19 pandemic. The findings of this study will help understand the implications of adopting online learning methods for medical education in the long run. There are a few limitations in this study. There were only 4 focus group discussions representing the students of four years in one medical college. This limits the findings to one institution and represents the experiences unique to that institution. The institution is one of the well-resourced and staffed institutions in the country. The situation in other medical colleges is likely to be very different compared to this one.

We recommend that any future attempts at including online classes into routine medical education must consider these key points during implementation. While online lectures for teaching theoretical concepts might be extremely useful, they cannot be used for saving instructional time. Dedicated college hours must still be allocated for engaging in these online learning activities as self-directed learning sessions in order to overcome the gendered impact of the online learning interface. The technical glitches are mostly experiences in live online classes, and therefore streaming of recorded video lectures must be considered to overcome this problem. There must be adequate emphasis on clinical bedside teaching and the online teaching must be reserved for teaching theoretical concepts.

Conclusions

This qualitative exploration of medical students' experiences of online learning revealed that they faced several challenges the most serious among them being a compromise in their clinical learning. There seemed to be a gendered impact of the lockdown on the learning experience. The generational difference between senior teachers and the students in adaptation to technology influenced the online teaching. These points must be borne in mind while integrating online learning techniques into medical education.

Declarations

Ethics approval and consent to participate
This research was conducted in compliance with the National Ethical Guidelines for Biomedical and Health Research involving Human Participants as recommended by the Indian Council of Medical Research in 2017. The study proposal was reviewed by the Institutional Ethics Committee of Madras Medical College, Chennai and approved. We obtained a written informed consent from all participants in the FGDs before starting data collection.

Consent for publication
Not Applicable.

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