Perceptions of medical students regarding online learning versus traditional learning amid the COVID-19 pandemic: a cross-sectional study in Maharashtra, India

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ABSTRACT

Introduction
The current COVID-19 pandemic has forced medical colleges to withhold traditional teaching and resort to online learning as an alternative method. Blending online and traditional learning in medical education has a vast scope considering that technology will advance further in future. This study was conducted to assess students' perceptions regarding online learning versus traditional learning during the COVID-19 pandemic.

Methods and Materials
A cross-sectional study was carried out among undergraduate medical students of a private medical college in Maharashtra, India. All students from the 3rd year MBBS cohort (n=100) were invited to participate. Data were collected through email using a semi-structured, self-administered questionnaire that surveyed students' perceptions about teaching and learning methods. The collected data was analyzed with descriptive and inferential statistics using SPSS version 16.0.

Results
Out of the 100 eligible students, 96 enrolled in the study. We observed mixed perceptions of the different teaching and learning methods in relation to various parameters, related to traditional and online learning, during the students' first, and short, experience of the Zoom platform. Of the 96 students, 47% liked the transition against 53% who did not, but this split was not statistically significant (p=0.38). There was no significant association between gender and like or dislike of the transition.

Conclusion
This study found mixed perceptions of participants regarding teaching and learning methods: 30% preferred traditional classrooms, 19% preferred online and 51% considered online methods to be equally good. Traditional teaching was strongly preferred with regard to the flow of lectures and the learning-teaching environment. Thus, in future a blend of both methods can be utilized to improve learning experience in medical education.

Keywords: Perceptions, Medical students, Online learning, Traditional learning, COVID-19 pandemic, Zoom

INTRODUCTION

Learning is a process of achieving knowledge and skills, and then performing these skills. Thus, learning is ultimately considered one of the fundamental pillars required to bring about development and societal change.[1] E-learning is the use of network technologies to create, foster, deliver and facilitate learning – at any time and from anywhere – to empower the individual learner so that the teacher/trainer/tutor is no longer the gatekeeper of knowledge but rather the facilitator of the knowledge process.[2]

The World Health Organization (WHO) declared the outbreak of COVID-19, a novel disease caused by the SARS-COV-2 coronavirus, a public health emergency of international concern on 30 January 2020. By March 2020, the situation had been declared a pandemic.[3] COVID-19 has disrupted every aspect of the healthcare system, medical education included. In a bid to contain the spread of the virus, India mandated a nationwide lockdown on 24 March 2020. As a result, online teaching replaced traditional classroom teaching for the duration of the lockdown. This sudden transition to online teaching presented a range of challenges to the students as well as the teachers. Practical classes and clinical postings were suspended, which posed difficulties in effective skill training and learning as contact with patients is essential in medical students' education: they cannot rely on books alone for medical knowledge and competency[4] or bedside manner.

The conventional mode of learning in medical education is a combination of classroom lectures and practical classes. This combination provides an efficient way to transfer knowledge and skills but, when this was unable to continue during the pandemic, online learning emerged as an alternative method for this time of unprecedented crisis.[5] The Medical Council of India has changed guidelines to enable the teaching of medical students to continue during the current situation.[6] In accordance; medical colleges adopted learning through the online platform Zoom, and the Zoom app, to conduct classes. Outside of the pandemic, online teaching sessions through platforms such as Zoom have shown high levels of engagement in students who have returned home,

allowing individuals to access teaching regardless of their location.[7] To address the educational needs of healthcare workers, WHO and the United Nations have recommended e-learning as an effective tool, particularly in developing countries.[8]

Online teaching has played a key role in medical education over recent years and has demonstrated several benefits in enhancing student learning.[9] It is likely that e-learning and telemedicine will continue to offer vital sources of medical education and many authors have suggested that digital health platforms for both patients and students will remain an integral part of care even after the COVID-19 pandemic.[10] Thus, having a greater understanding of the perceived advantages and drawbacks will allow medical schools to improve their delivery of online teaching.

The COVID-19 pandemic has put us in a unique position to evaluate the significance of online teaching platforms in medical education.[11] Many students have acknowledged the impact of COVID-19 on their education[7] but to date few studies have investigated the perceptions of medical students in Maharashtra, India. Therefore, we aimed to investigate their perceptions regarding online learning vs traditional learning during the pandemic. Improving our understanding of this could help to develop medical education methods in the future.

METHODS AND MATERIALS

The cross-sectional study was conducted in a private medical college of Maharashtra from 5 April 2020 to 30 June 2020, after obtaining necessary approval from the institutional ethics committee.

The convenient sampling method was adopted and 100 students of 3rd year MBBS (the entire cohort) were included in the study, after taking informed consent. In view of the lockdown imposed by government authorities for controlling the COVID-19 pandemic and online teaching-learning method adopted by the college during that period, the questionnaire was sent by email to students. The semi-structured self-administered questionnaire included relevant personal details along with questions assessing the

students' perceptions regarding teaching and learning methods. The assessment questionnaire consisted of 13 close-ended multiple-choice questions and two non-mandatory open-ended questions. Four students who did not send answers by email were excluded from the study. There were no incompletely filled questionnaires, leaving a total of 96 medical students who filled and submitted the questionnaire and thus were included in the study.

Data was entered in Microsoft Office Excel and analyzed with SPSS version 16.0. Descriptive statistics were used to calculate frequency and percentage for each of the responses given. A Chi-square test was used to determine association between gender and like or dislike of the transition in teaching and learning methodology. A p value of less than or equal to 0.05 was considered significant.

RESULTS
A total of 96 undergraduate medical students who participated and correctly filled the questionnaire were included for analysis. Among the participants 61 (63.5%) were female and the remaining 35 (36.5%) were male students. All the participants were in the age group of 19-22 years. (Table 1)

Our study found that 45 (47%) participants liked the transition to online learning but a small majority participant (53%) disliked it but this was not statistically significant (p=0.38). (Figure 1) There was no significant association between gender of the study participants and their liking or disliking of the transition (p=0.55). (Table 2 and Fig 1) The students' perceptions of traditional learning versus online were mixed. The majority of the participants felt that traditional i.e. classroom methods are superior, particularly in relation to teaching and learning environment (64.6%), with a smaller majority also preferring in-person teaching for flow of the lecture (56.2%) but were divided on which had more value for face-to-face interaction (51%), assessment (50%) practical experience (49%), ability to resolve queries (47.9%). A small minority scored online classrooms lower with regard to student satisfaction (44.8%) and communication (35.4%). Traditional and online teaching and learning methods were felt equally good by the 42.7% of students in relation to their enthusiasm or motivation to learn, 41.7% in terms of clear explanation of the topic, 38.5% for theoretical experience and by 51% for the overall teaching-learning methodology (Table 3).

Fig 1 Perception of participants regarding the transition in teaching-learning method (n=96)

Liking of transition traditional to online learning

Yes ■ No ■

53% 47%
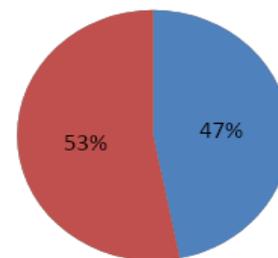
Table 1 Distribution of the study participants as per age and gender (n=96)

Parameters		Frequency	Percentage
Age	19 Years	2	2.1%
	20 Years	41	42.7%
	21 Years	38	39.6%
	22 Years	15	15.6%
Gender	Female	61	63.5%
	Male	35	36.5%

Table 2 Association with gender of study participants with like or dislike of the transition

Variable	Whether the transition in teaching-learning method was liked or not			P-value (test of significance applied)
	Yes frequency (%)	No frequency (%)	Total frequency (%)	
Gender Female	30 (49%)	31 (51%)	61 (100%)	0.55 (Chi squared)
Male	15 (43%)	20 (57%)	35 (100%)	
Total	45 (47%)	51 (53%)	96 (100%)	

Table 3 Perceptions of study participants regarding online learning versus traditional learning (n=96)

Which teaching-learning methodology is better with regards to:	Traditional (classroom)	Online (Zoom platform)	Both are equally good
	Frequency (%)	Frequency (%)	Frequency (%)
Face-to-face interaction	49 (51%)	25 (26.1%)	22 (22.9%)
Ability to solve queries	46 (47.9%)	22 (22.9%)	28 (29.2%)
Flow of lecture	54 (56.2%)	33 (34.4%)	9 (9.4%)
Student satisfaction	43 (44.8%)	21 (21.9%)	32 (33.3%)
Enthusiasm/motivation to learn	26 (27.1%)	29 (30.2%)	41 (42.7%)
Teaching -learning environment	62 (64.6%)	21 (21.9%)	13 (13.5%)
Clear explanation of the topic	22 (22.9%)	34 (35.4%)	40 (41.7%)
Communication	34 (35.4%)	32 (33.3%)	30 (31.2%)
Assessment	48 (50%)	19 (19.8%)	29 (30.2%)
Theoretical experience	32 (33.3%)	27 (28.1%)	37 (38.5%)
Practical experience	47 (49%)	15 (15.6%)	34 (35.4%)
Overall teaching-learning methodology	29 (30.2%)	18 (18.8%)	49 (51%)

A small number of the participants responded to the open-ended questions related to liking or not liking particular aspects of online or traditional learning and their expectations about change or modifications to the teaching and learning methodology. These responses included asking for provision of e-learning resources; to have audio-visual contents in the form of powerpoint presentations or YouTube links; Google form questionnaires for assessment and quiz purposes; use of other platforms such as Microsoft Teams or Google Meet for interaction; installation of wi-fi in hostels and on college campus; connectivity issues needing to be addressed; and for the college to continue online learning along with traditional learning after the end of the pandemic.

DISCUSSION
The pandemic has created tough challenges for educational systems[12], forcing a sudden shift towards the adoption of exclusively online teaching as the primary source of medical education. This adoption of online technologies has enabled students to continue to learn remotely[13] and offers opportunities for educators to adopt newer online techniques that are suitable for the present generation learners.[14] The modern era of technology offers vast scope for e-learning in medical education. Currently smartphones and computers providing internet access are essential components of the life of a medical student.[15]

Nevertheless, learning that relies on the internet for online delivery needs to be tailored towards different learning styles to enable it to be impactful and effective[13]. The potential role of professional use of social media platforms such as Zoom in facilitating medical education has also been highlighted[16]. It is, however, important to note that significant differences have been recorded in learning outcomes

between e-learning and traditional learning.[17] One systematic review suggested that offline teaching and online teaching are equivalent in terms of outcomes of examinations[18] but regardless of which method studies show to be more beneficial, some people still support the idea of traditional learning, while others believe in the potential of the e-learning system[19] as the mixed results recorded in this study confirm. Advances in digital technology have enabled medical education to continue in spite of the pandemic: the traditional classroom teaching method had to be substituted in order to make sure academic activities for the students remain as unchanged as possible throughout the pandemic. With this has come the necessity of using various online tools in order to conduct classes.[20]

In this study, online learning was compared with traditional learning and was assessed in terms of the perspectives of undergraduate medical students and found that the numbers who liked and disliked the transition to online learning were roughly equal. Similar studies have been carried out across the world, including in China, France, India Nepal and Pakistan.[20-25] Lyngdoh M et al (2021) found that a strong majority (83.1 %) of the students in Meghalaya, India, did not prefer online classes over live classes as a mode of teaching[20] and in a study conducted in Nepal by Singh R et al (2021), 94.6% of the students were not in favour of online classes.[23] A study in France by Motte-Signoret E et al (2021) found that only one third of the participants were in favour of online teaching continuing after the end of the COVID-19 crisis.[24] Singh KV et al (2021) observed that students in Agra, India, found the switch to online learning less appealing due to perceived limitations.[25]

In our study, we found that there was no significant association between the gender of the study participants and their like or dislike of transition to teaching and learning online. This differs from other studies including ones carried out in India (e.g. by Lyngdoh M et al, 2021), which have found a significant difference in gender preference towards online learning, with female students more resistant than their male counterparts,[20] though in contrast to this, a study conducted by in China (Wang C et al, 2020)

found that male students gave lower evaluations and expressed less satisfaction with online learning than female students.[26] A possible explanation for such difference in findings could be the ease with which individuals use digital technology and the accessibility of online learning from their respective locations, and cultural differences within the populations studied.

In relation to student-teacher interaction, similar findings have been observed in other studies. In India, Singh KV et al (2021), found the majority of the respondents felt that there was lack of interaction while attending online learning.[25] Also, studies conducted in Pakistan and Indonesia show that online learning has limited interactive knowledge building between teachers and students.[22,27] Lyngdoh M et al (2021), in India, also found that the level of interaction with the faculty staff was not satisfactory.[20] In relation to flow of the lecture, similar findings have been observed in other studies carried out in India, which noted that the flow of lectures was often disrupted due to internet connectivity issues.[20,28]

Various studies show findings consistent with ours in relation to practical experience and assessment methods. Patil et al (2020)[29] mention that medical education requires bedside and soft skills, which the students cannot learn through online classes. The study notes that medical students usually hear, during the course of their education, comments such as, "What you read, you might forget. What you see (in clinics), you will always remember"; this is harder to replicate online. Students cannot learn practical clinical skills through online classes and some believe that their written examinations have been affected by the adoption of online learning.[20] Huddart (2020) also observed that a key concern among students is that remote learning impacts their ability to develop clinical competence.[30]

Cantoni Virginio et al (2004) remarked that in order to take a 'real' course or a 'real' exam, the student needs to be physically present in a certain place, such as a classroom, and have a teacher or trainer to guide them at all times. They also reported some disadvantages regarding e-learning such as lack of interpersonal skill development, difficulties with memory and learning

development, and lack of student motivation. They concluded that face-to-face learning provides live interaction with the instructor and helps students to organize their studies.[31]

Numerous studies have found that e-learning has a negative impact on students' achievements. Ross et al (1999) argue that a major disadvantage of e-learning is that the students need to have self-discipline.[32] Studies carried out in India and Indonesia among medical students also observed that the majority of students perceived challenges with concentration and lower understanding in online teaching.[25,27]

However, online learning does have some benefits. Teachers, as well as students, see that online learning methods encourage pursuing lessons from anywhere and in difficult circumstances that prevent them from reaching universities and schools. The student becomes a self-directed learner and learns simultaneously and asynchronously, and is able to do so at any time.[33] We authors expect that the present study will provide inputs to assess the challenges in current online medical education as well as provide key information for further research in similar areas. We recognize limitations of the study. Students were using an e-learning environment for the first time in their academic careers. Since the study was conducted early on in their experience of online learning, and they only had a short exposure, they might have not formed strong perceptions and the

process of changing perception may still be ongoing. In addition, students' perceptions were ascertained based on feedback received through email questionnaires only and their knowledge and skills about handling information technology tools was not taken into consideration.

CONCLUSION

The current COVID-19 pandemic has forced us to change traditional learning methodology and resort to online learning for medical studies. This study found mixed perceptions of participants regarding teaching-learning methods with roughly equal numbers (47%:53%), liking and not liking the transition from traditional learning to online learning, bearing in mind the small sample size. Around half of the students (51%) considered online methods and traditional methods to be equally good overall and for some specific parameters, including enthusiasm and motivation to learn (42.7%), clear explanation of the topic (41.7%) and theoretical experience (38.5%).

Thus, in future blending both methods can be utilized to improve learning experience in medical education. Medical colleges should be advised to provide students with appropriate information technology training sessions in their initial years of study.

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