

# Practical Anatomy Online Learning among COVID-19 Pandemic Era: Perceptions of 1<sup>st</sup>-Year MBBS Students

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## Abstract

**Introduction:** With the rise of the COVID-19 pandemic, digital learning has been implemented in medical colleges across India to continue the ongoing medical education. Anatomy is the basis of medical science and is best learned through offline classes that allow students to experience the texture of structures and handling of specimens. During this pandemic period, cadaveric dissection was not used to study anatomy. The aim of this study was to learn about students' attitudes regarding virtual teaching and learning in anatomy, as well as the problems they may confront. **Materials and Methods:** A descriptive cross-sectional study was conducted in the department of anatomy among the 50 1<sup>st</sup>-year MBBS students of All India Institute of Medical Sciences, Rajkot in April 2021. Google Forms were used to obtain informed consent from students. Prevalidated questionnaires were given online to the students and responses were noted and descriptive statistical data was derived from the analysis. **Results:** About 37 (74%) respondents found traditional classes are better than online teaching. Majority preferred to attend anatomy practicals offline with safety precautions. About 17 (34%) showed interest in prerecorded videos. About 35 (60%) students faced social isolation as an impact of online learning. Technical issues and distractions were the key problems faced while learning anatomy online. **Conclusion:** Prerecorded videos of the practicals are helpful in teaching anatomy practicals, and can be used in future to ensure an unbroken, continuous, and effective delivery of medical education.

**Keywords:** Anatomy education, COVID-19, online learning

## INTRODUCTION

Anatomy is the foundation of medical science<sup>[1]</sup> and is best acquired in a classroom setting as it requires basic abilities such as feeling the texture, recognizing structural relationships and handling specimens, and provides a solid foundation for the practice of medicine.<sup>[2-4]</sup> The COVID-19 pandemic has had a major impact on medical education worldwide and changed both lectures and practical classes from the physical classroom to the online platform. The pandemic has harmed 85% of enrolled pupils globally, according to the United Nations Educational, Scientific, and Cultural Organization.<sup>[5]</sup> With pandemics and lockdowns on the rise, there are numerous obstacles for students at all levels of education, particularly medical students, and medical universities recommended that online programs be used to continue ongoing medical education. Online learning of anatomy was never considered a part of medical education in India until the spread of COVID-19 recently. The students and teachers are still getting used to the new system. This

study was done to learn about students' perceptions regarding virtual teaching and learning in anatomy, as well as the potential challenges they may experience.

## MATERIALS AND METHODS

### Study design

The present study was web-based and descriptive cross-sectional in design.

### Study setting

The study was conducted in the Department of Anatomy, All India Institute of Medical Sciences, Rajkot, in April 2021. This college was started in December 2020 with the first batch of 50 students. We have attached the permission letter to conduct the study.

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### Study population and sample size

The study participants were 50 1<sup>st</sup>-year MBBS students, who underwent both, classroom teaching from December 2020 to March 2021, followed by online teaching from April 2021 to June 2021.

### Study tool

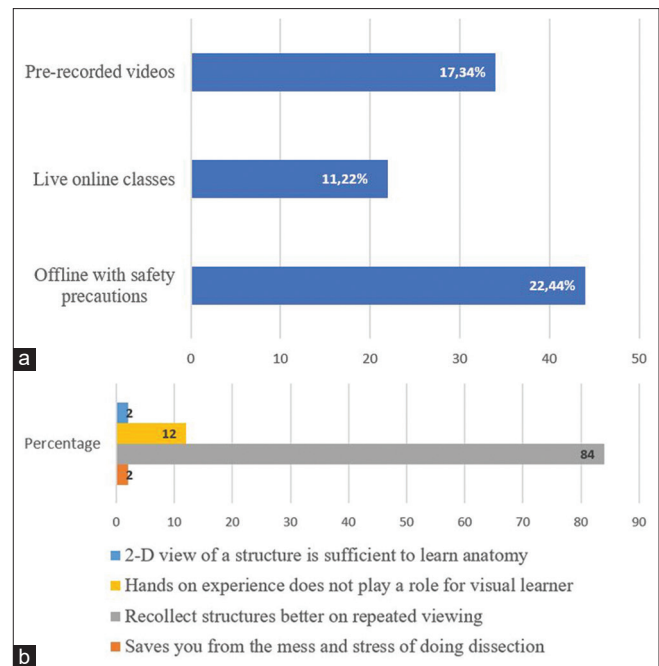
Students were given prevalidated questionnaires with closed-ended responses about learning anatomy practicals online during the epidemic, their obstacles, and how it has affected them psychologically through a Google Form. The validation was done by checking the questionnaire with expert faculty and conducting a pilot study among a few students followed by checking the reliability using SPSS version 20.0 for Windows (SPSS Inc., Chicago, IL, USA). There were three sections to the questionnaire. Section one contained a general perception toward online teaching. Section two contained perceptions toward teaching anatomy practicals online. Section three included questions related to various challenges faced by them. Multiple response options were also provided for sections one and two. The responses were noted and analyzed to derive the descriptive statistical data.

### Data collection and analysis

The students were contacted through WhatsApp and the link to fill the Google Form was shared on the same platform. The students were explained about the study objectives and directions were given to complete the questionnaire in their regular Zoom online portal. Informed consent was taken online through Google Forms. Any information about the students has been kept anonymous and confidential. The students were given a 3-day duration to give response to the questionnaire and those who did not respond within the defined time were not included in the study. The collected data were tabulated and analyzed using SPSS version 20.0 for Windows (SPSS Inc., Chicago, IL, USA). Descriptive analysis was done and categorical variables were presented as percentages (%).

## RESULTS

A total of 50 students participated in the questionnaire survey. The overall perceptions were both favorable as well as unfavorable toward online teaching of anatomy practicals. Seventy-four percent of the students were of the opinion that traditional teaching is better than online teaching [Table 1]. Majority of the students preferred to attend practical classes offline in small batches using the COVID-19 safety protocol [Figure 1a]. Students' preference for practical classes in anatomy is shown in Table 2. Students preferred prerecorded videos of dissection over live online streaming of dissection [Figure 1b]. The impact of learning anatomy online on students' psychology has been described in Figure 2a. The main challenges encountered during online learning were issues with Internet connectivity and students' perceptions of a lack of opportunities to build practical skills [Figure 2b].



**Figure 1:** (a) Students' responses on preferred mode for conducting anatomy practicals. (b) Students' opinion on the usefulness of prerecorded videos of dissection

**Table 1: General perception toward anatomy practicals**

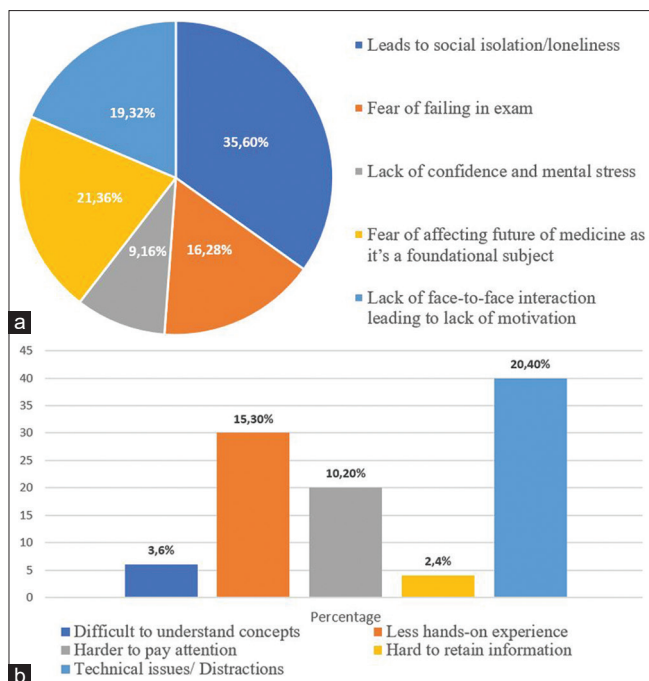
Overall perception toward online teaching	Students' responses	
	Positive, n (%)	Negative, n (%)
Online classes are better than traditional teaching	13 (26)	37 (74)
Has access to the Internet with 4G	47 (94)	3 (6)
Financial burden to pay for Internet access/gadgets	7 (14)	43 (86)
Well-dressed to create the ambience of attending college	27 (54)	23 (46)
Can clear concepts/doubts while online teaching	30 (60)	20 (40)

**Table 2: Preference for practical classes of anatomy**

Preference for practical classes of histology/osteology/surface marking	Opinion of students, n (%)
Prerecorded PPT containing original pictures of histology slides	31 (62)
Using existing atlas pictures for histology	2 (4)
Viewing histology slides under a microscope using safety precautions offline	17 (34)
Learning surface marking online is effective	23 (46)
Learning osteology online is effective	34 (68)

## DISCUSSION

Medical education has faced significant challenges ever since the COVID-19 pandemic creating opportunities for us to adopt newer techniques to continue the ongoing studies.<sup>[6]</sup> With limitations of public movements and social distancing being



**Figure 2:** (a) Students' opinion on effects of online learning of anatomy on their psychology. (b) Students' responses on various challenges faced during online learning

implemented during the lockdown period, it has changed the perspective of conventional classroom teaching and cadaveric teaching.<sup>[7]</sup> In our study, the majority of the students opined that traditional classroom teaching is the best for learning anatomy but in crisis, students have adapted themselves quickly to the online teaching of anatomy. Students have become self-directed learners over time and have found this to be a beneficial tool in lockdown.<sup>[8,9]</sup> The Medical Council of India has also created a new Competency Based Undergraduate Curriculum (CBME) curriculum that includes self-directed learning that is mostly based on e-learning.<sup>[10]</sup>

Although practical classes of anatomy were hard to comprehend from the online classes, the greatest challenge was to let go of tactile learning through dissections and handling of anatomical specimens.<sup>[11]</sup> Many of the respondents felt the lack of teacher–student interaction and lack of feeling of a medico which was similar to the studies conducted by Daroedono,<sup>[12]</sup> Bettinger *et al.*,<sup>[13]</sup> and Abbasi *et al.*<sup>[14]</sup> Knowledge building and interaction between teachers and students are limited in online learning. Our students found prerecorded videos of the practicals, especially dissection and osteology very beneficial. Ninety-two percent of the students were very satisfied with this method than the live streaming. It provided them adequate time to study the topics covered and view them again to revise contrary to the study by Roy *et al.*<sup>[15]</sup> where 53.36% of students could not keep up with the progress of the classes on a daily basis. Prerecorded PowerPoint showing original pictures of histology slides followed by regular assessment was helpful to understand concepts. The time flexibility was a boon to them in learning anatomy at their own pace and better performance in exams. A study showed that

one-fourth of the students were not able to adapt and left the course in-between.<sup>[16]</sup> Therefore, skilled leadership is a necessary tool to facilitate their transition to online learning and transform the learning experiences of learners.<sup>[17]</sup>

The challenges vary across countries and institutions, In Cambodia, it was limited resources, including technological and human resources.<sup>[18]</sup> A study done by Bakia<sup>[19]</sup> shows one of the greatest challenges in implementing online learning in developing countries like India includes Internet connection costs and technical issues. In our study, the majority of students had an Internet connection and preferred to use mobile phones as a device over laptops. It is similar to the study by Martinez.<sup>[20]</sup>

Many of our respondents have faced technical errors which had interrupted their flow of learning which was contrary to a study conducted in Indonesia owing to better advanced technology than ours.<sup>[21]</sup> Our students also found harder to stay focused due to long hours of screen time as per their combined schedule for 1<sup>st</sup>-year subjects. Studies have shown that a lack of sense of social connection, time restraints, and difficulty in assimilating the subject posed as challenges.<sup>[22]</sup> The impact on the students' emotional aspects was of major concern during online teaching. In our study, lack of interaction with their peers and extracurricular activities in college lead them to a feeling of loneliness. Studies have reported that students were found lagging in their mental health.<sup>[23,24]</sup> The workload has caused stress, anxiety, and frustration among the students.<sup>[25-27]</sup> During the COVID-19 epidemic, cybercrimes such as cyberbullying, online aggression, exploitation, and psychological concerns have been linked to online learning.<sup>[28,29]</sup> Online education can only be effective by overcoming certain barriers such as infrastructure, students' competence, technical expertise, and instructors' motivation.<sup>[24,30]</sup>

## CONCLUSION

Prerecorded authentic videos of anatomy practical classes and minimizing the technical glitches can match up to offline classroom teaching to an extent and can be a game changer during the pandemic. Online learning of anatomy is the band-aid in the present pandemic situation with the unpredictability of future. Although it can never replace traditional classroom teaching, we must mould ourselves to the newer learning methods to continue the ongoing education purposeful and effective. Although the possibility of conducting anatomy practicals with COVID-19 safety protocols is still to be considered in future.

## Limitations

The observations of the study are bounded to a single institute and with less sample size. Hence, it cannot be utilized for generalized statements.

## Recommendations

To understand more about the elements that influence students' attitudes regarding online anatomy practicals.

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## Conflicts of interest

There are no conflicts of interest.

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