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STUDENT'S PERSPECTIVE OF LEARNING ANATOMY VIA ONLINE VS TRADITIONAL TEACHING METHODS: A CROSS-SECTIONAL STUDY.

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Abstract

Background- The impact of COVID-19 pandemic has been profound not only on physical health but also on routine teaching worldwide because of containment measures being taken for its prevention. Medical education has also been affected due to cancellation of classical "classroom teaching". Despite all current reports championing online education, researchers are still questioning its efficacy. Research is still being conducted on the effectiveness of computer-assisted teaching. Thus far, literature on the efficacy of online courses is expansive and divided. The objective of this study is to investigate perceptions of medical students on learning Anatomy via Online vs Traditional teaching methods of education during the COVID-19 pandemic.

Aim: To investigate perceptions of medical students on learning Anatomy via Online vs Traditional teaching methods of education during the COVID-19 pandemic

Results: A total of 153 students participated in the study. The mean age of participants was 20 years. Majority of students (91%) preferred traditional method for learning Anatomy. Also, 81% students were strongly in favour of learning anatomy by personally dissecting and using the cadaver. Majority of the students (84.9%) were motivated to study anatomy using conventional method of teaching. 67.3 % students said that they lost interest during online classes considering 78.4% students found learning anatomy online more difficult than conventional methods.

Conclusion: It has been noted that anatomy as a subject requires dissection and understanding of human anatomy, which despite presence of varying degrees of 3-D and AI (Artificial Intelligence) models cannot replace the cadaver dissection which is a fundamental of anatomy. Moreover, any online tool will not help the student to delve into the depths of human anatomy. So, there would be an inclination of the students for traditional method of teaching, particularly for anatomy.

Keywords: Medical education, anatomy, online teaching, traditional teaching, medical students.

Introduction

The impact of COVID-19 pandemic has been profound not only on physical health but also on routine teaching worldwide because of containment measures being taken for its prevention. Medical education has also been affected due to cancellation of classical "classroom teaching". As there is uncertainty about duration of this pandemic and social distancing measures are needed for long, hence, education of future doctors requires intense and prompt attention.[1] Distance E-learning in medical

education may represent a suitable alternative to traditional learning to deliver high-quality education.[2] Distance E-Learning is defined as using computer technology to deliver training, including technology supported learning either online, offline, or both. There are 2 modes of E-learning: distance learning and computer-assisted interaction (CAI). Moore et al. defined distance E-learning as providing access to learning for those who are geographically remote from the instructor.[3]Challenges to online education reported in the medical literature so far include issues relating to time management, use of technology tools, students' assessment, communication, and the lack of in-person interaction.[4]

Contrary to popular belief, online education is not a new phenomenon. The first correspondence and distance learning educational programs were initiated in the mid1800s by the University of London.[5] Newly introduced, outcome based, competency based curriculum in India advocates e-learning as a tool for self- directed learning in learners.[6] In the anatomical sciences, computer-aided instruction and online learning tools have become a critical component of teaching the intricacies of the human body when physical classroom space and cadaveric access are limited.[7]

Despite all current reports championing online education, researchers are still questioning its efficacy. Research is still being conducted on the effectiveness of computer-assisted teaching.[5] Thus far, literature on the efficacy of online courses is expansive and divided.[8]

The advantages and disadvantages of both instructional modalities need to be fully fleshed out and examined to truly determine which medium generates better student performance.[5] The disappeared practical teaching at the hands of Covid-19, will most likely have many lasting impacts on students.[7]

Traditionally, advanced human anatomy laboratory classes have relied on "hands-on training" with human cadavers as the primary instructional material. The hands-on study of human cadavers is widely regarded as the "gold standard" for medical training and instruction in human anatomy.[9] Anatomy education fosters a comprehensive understanding of anatomical structures and ultimately aims to enable students to locate and understand their relative positions and varying spatial relationships.[10]

Students in health profession fields are required to gain and integrate theoretical and clinical knowledge in a suitable environment to become safe and competent health professionals. The importance of one-to-one supervision and hands-on training in such fields poses a challenge for e-learning curricula.[11] Loss of face-to-face contact and direct interactions with both peers and teachers may potentially stunt students' development in learning anatomy.[7] Without insight into this issue, we cannot understand the best way to implement educational technology to enhance student learning.[12]

Despite much research, effort has been devoted to investigating student's perception, attitude and self-efficacy. Few studies have compared student's perception of online versus face to face learning[13] of Anatomy. The objective of this study is to investigate perceptions of medical students on learning Anatomy via Online vs Traditional teaching methods of education during the COVID-19 pandemic.

Material and Methods

Aim and objectives- To investigate perceptions of medical students on learning Anatomy via Online vs Traditional teaching methods of education during the COVID-19 pandemic

The study was conducted on students in Christian Medical College and Hospital. A total of 153 students participated in this study. A structured questionnaire comprising of 16 questions was circulated to the students using Google forms. Of the 16 questions, seven questions were asked using Likert's scale, five close ended questions and four open ended questions were asked. The duration of the study was from March 2021 till February 2022. The study was approved by the Institutional Ethics Committee (IEC).

Study design

This was a Cross- Sectional study observational study

Sample

Convenience sampling was used for the study.

Data Analysis

Data was analysed using Epidata Entry and Analysis. Significance was set at $p \leq 0.05$. Mean data was compared using the independent sample, two tailed student's t-test. Frequency data was compared using the Chi-square test.

Traditional method of teaching included face to face lectures using power point presentations combined with chalk- board teaching. Lectures were followed by dissection hall and histology practicals in small groups.

Online teaching was conducting in form of power point presentations. For demonstration of various specimens, topic wise videos were made in department of Anatomy. The videos comprised of dissected specimens, which were explained by a faculty member. Thereafter, the videos were shown online to small groups of 14-15. The assigned faculty helped the students identify various structures in the specimen.

Inclusion Criteria

The undergraduate students who had signed the consent form and had undergone both methods of learning, Online and Traditional were included in the study.

Results

The mean age of participants was 20 years (range: 18-20 and 20.1- 22).

The final questions explored the following three themes:

1. General demographics.
2. The use and experience of online teaching during the COVID-19 pandemic.
3. Perceived benefits and barriers of online teaching.[14]

Cohort demographics: Of the 153 responses collected, 67.97% (n= 104) of respondents were females, 32.02 % (n= 49) were males. Non-response bias was minimised by ensuring the survey was shared by a variety of medical students via a range of platforms.

Statistics

1) Association between Gender and preferred mode of learning by medical students

Variable	Mode of learning			Total
		Traditional	Online	
	Females	77	4	81
Gender	Males	62	10	72
Total		139	14	153

Chi square= 2.676; df=1

A significant association (p=0.050) was found between Gender and Preferred mode of learning by medical students. Which signifies that majority of girls over boys prefer Traditional mode of learning over online teaching classes for Anatomy.

2) Association between age and preferred mode of learning by medical students

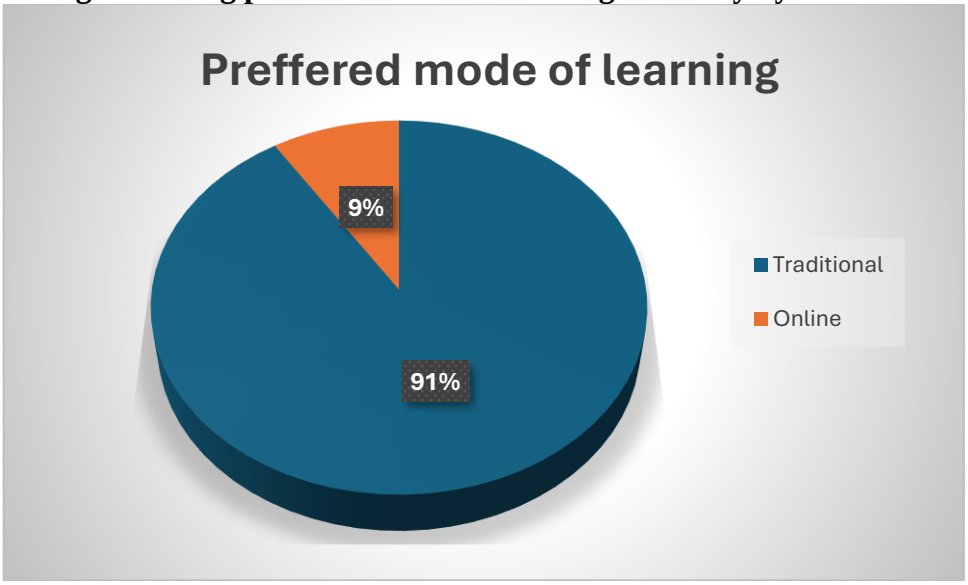
Variable	Mode of learning			Total
		Traditional	Online	
	18-20	70	8	78
Age group	20.1-22	69	6	75
Total		139	14	153

P=0.419; chi-square=0.0414; df=1

A non significant association was found between age group and preferred mode of learning by medical students. This could be because the gradual range of age group does not have much difference.

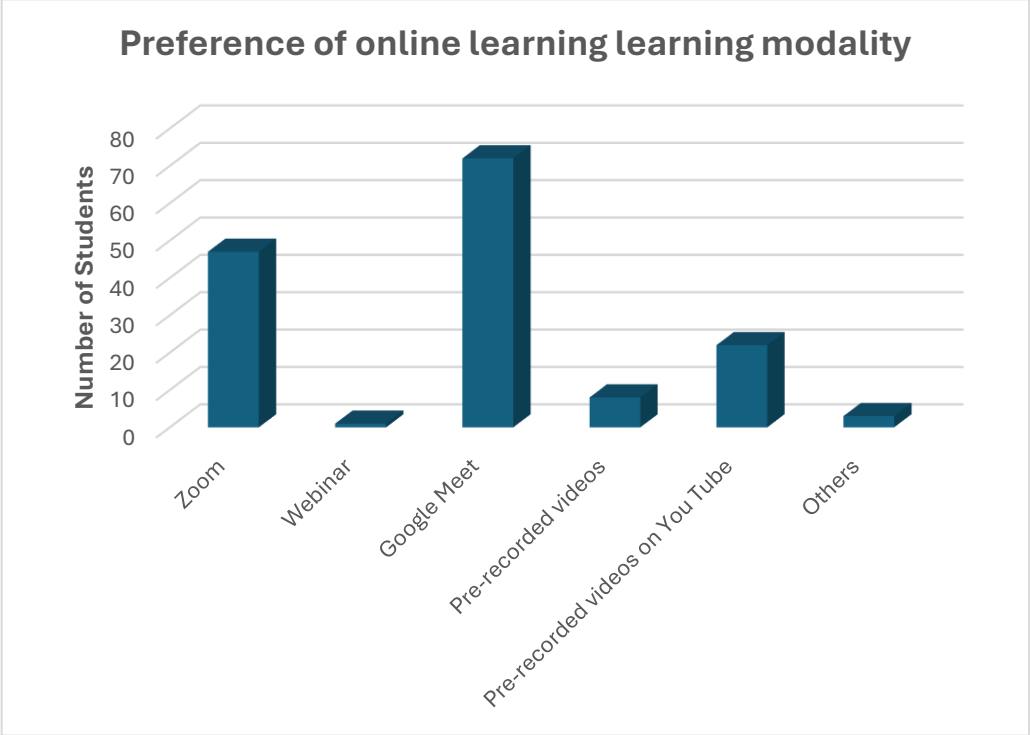
Student perception of online teaching:
Students ranked their experience of online teaching using a Likert scale with 1 being strongly disagree and 5 being strongly agree.
Majority of students (91%) preferred traditional method for learning Anatomy as shown in figure 1.

Fig 1 showing preferred mode of learning Anatomy by students.



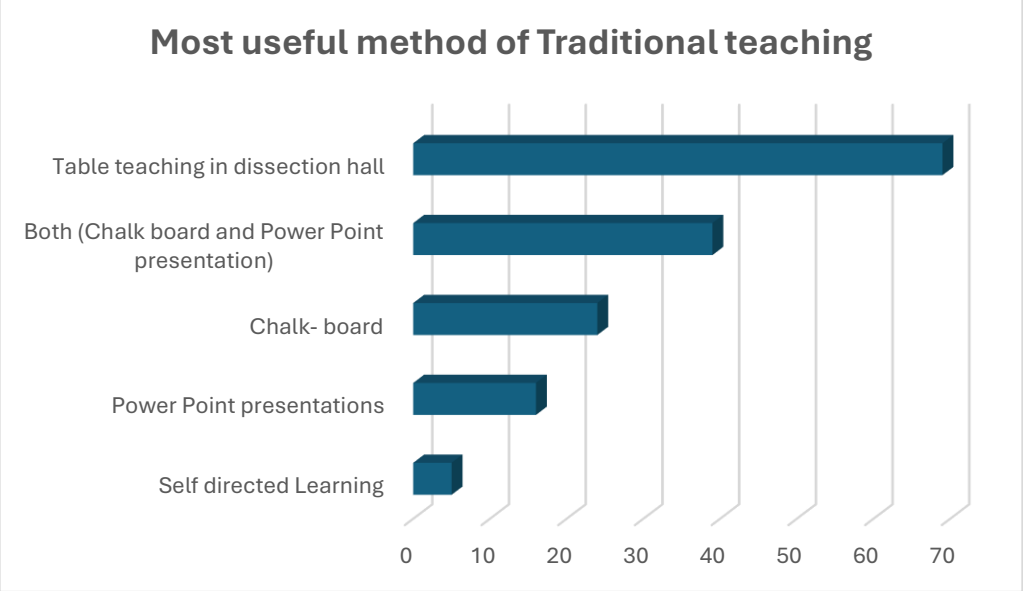
Amongst the various online platforms available, the preferred online learning modality of students has been shown in figure 2.

Figure 2 Preference of online learning modality for students



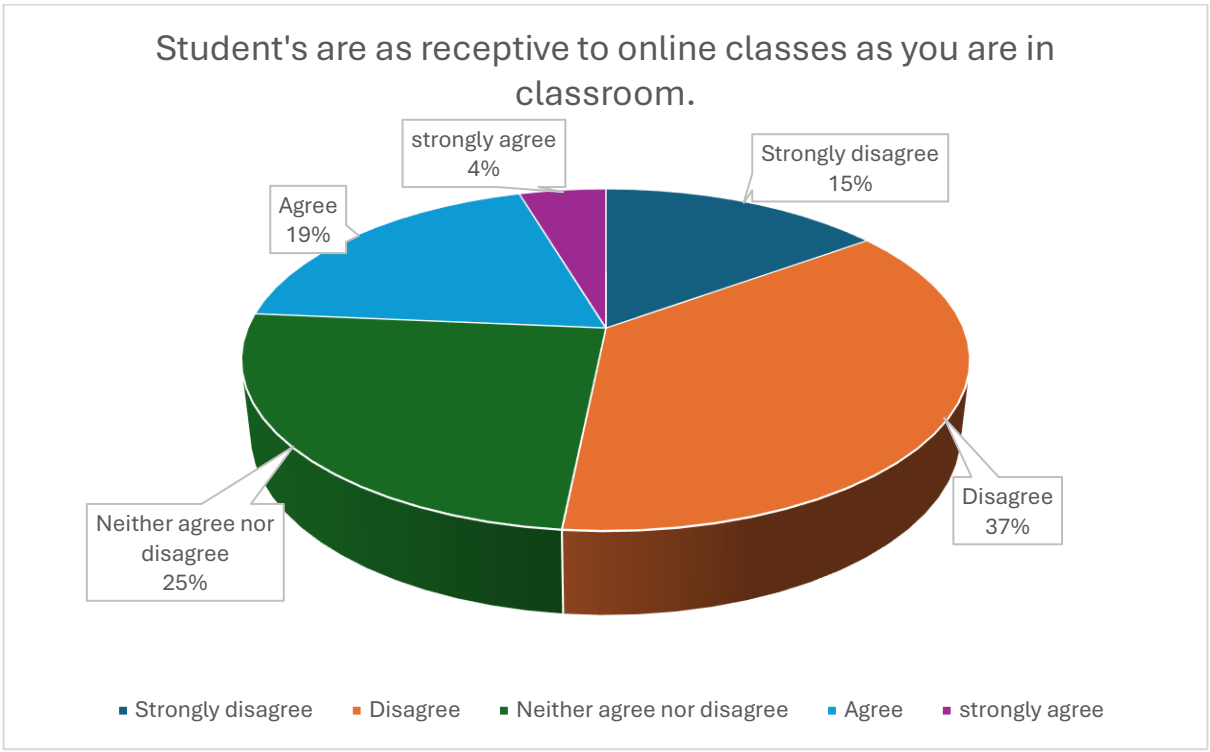
While there are various modalities of teaching, majority of the students (approximately 50%) preferred leaning anatomy in dissection hall. They regarded it as most useful method of traditional teaching as depicted in figure 3.

Fig 3 showing most utilized method of traditional teaching



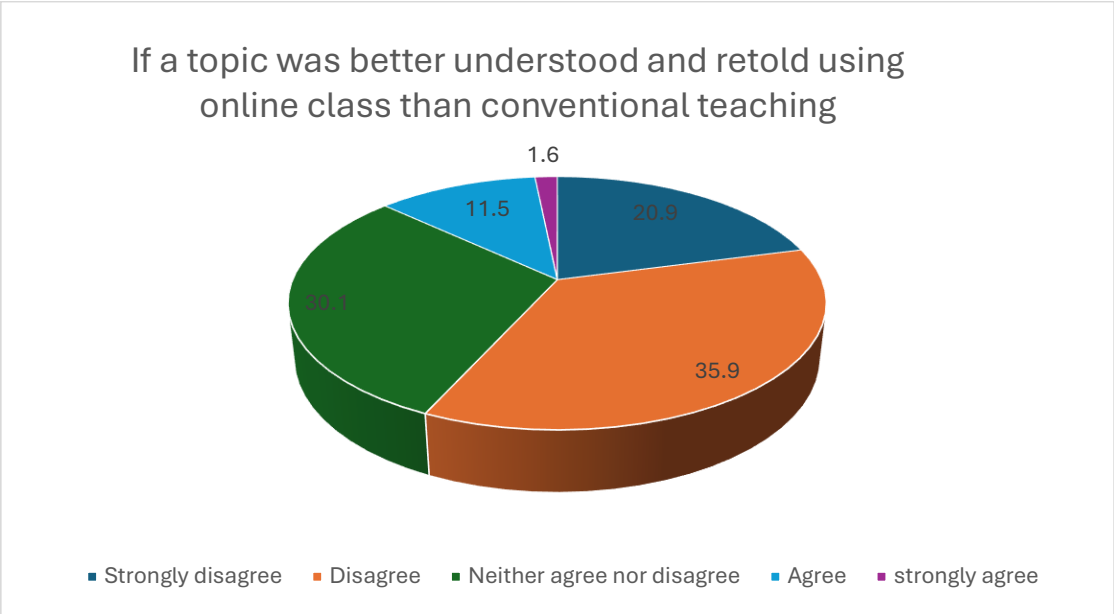
For 59.5% students, this was the first experience of online learning for students. About 28% of students faced initial mental resistance to online method of learning. In response to the question if students were as receptive to online classes as in classroom, 36.6% students Disagreed. Their varied response has been shown in figure 4.

Fig 4 showing response to if students were as receptive to online classes as they were in classroom.



Also, 81% students were strongly in favour of learning anatomy by personally dissecting and using the cadaver was better than seeing recorded videos online for the same.
Learning a concept from online class/videos, 56.8 % students were unable to present the same with better understanding as compared after conventional teaching as mentioned in figure 5.

Fig 5 showing various responses to the question if the student was able to understand and retell the lecture after online vs traditional lectures.



Majority of the students (84.9%) were motivated to study anatomy using conventional method of teaching. 67.3 % students said that they lost interest during online classes considering 78.4% students found learning anatomy online more difficult than conventional methods.
A common challenge faced by the students were inability to concentrate thorough out the lecture and unstable internet connections. These subsequently leads to lack of interest. Respondents also mentioned that understanding anatomy without a cadaver is extremely difficult. On the other hand, students also mentioned that online classes gave them more time for self-study.

Discussion

Medical education across the world has experienced a major disruptive change as a consequence of the COVID-19 pandemic and technology has been rapidly and innovatively used to maintain teaching and learning.[15] A transformative change in the current approach to medical education across the world is inevitable and it is essential to consider potential future scenarios to begin the process of preparing for the future.[16]
Medical schools and other medical education providers have rapidly scaled up the provision of educational content and training online, as well as faculty development in the use of technology, especially by online courses. Large group in-person lectures have been replaced by streamed online lectures. Small group sessions and tutorials have been replaced with interactive Webinars using web conferencing platforms.[15]
The rapid shift to virtual teaching due to the COVID-19 pandemic resulted in cataclysmic changes in the instructional programs for human anatomy classes. The predominant paradigm in human anatomy instruction quickly shifted from working directly with cadaver specimens to working virtually with online models and simulations.[17]
In a study conducted by McKivigan[17] et al, it was observed that students receiving in person instructions achieved comparatively higher grades versus those from online learning system. However, there was no statistical difference between the two cohorts in overall performance. Rajab[4]

et al concluded that 62.5% students were in favour of combined online with face to face interactions. Abbasi[18] et al stated that 75.7% students have a negative perception towards e- learning.
Despite various positive as well as neutral feedback towards learning anatomy via online and traditional methods of teaching, the present study is reporting that 56.8 % students were unable to present the same with better understanding as compared after conventional teaching and 91% students prefer studying anatomy via traditional methods.

Conclusion: It has been noted that anatomy as a subject requires dissection and understanding of human anatomy, which despite presence of varying degrees of 3-D and AI (Artificial Intelligence) models cannot replace the cadaver dissection which is a fundamental of anatomy. Moreover, any online tool will not help the student to delve into the depths of human anatomy. So, there would be an inclination of the students for traditional method of teaching, particularly for anatomy.

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