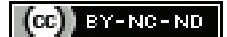# Perception of First Year Medical Students Regarding Anatomy Classes by YouTube Recorded Sessions versus Live Online Classes during COVID-19 Pandemic: A Cross-sectional Study

MUKUL SARMA[1], ANNIE DOLEY[2], MALAMONI DUTTA[3]

ABSTRACT

Introduction: Coronavirus disease 2019 (COVID-19) pandemic is a challenging situation for the education system worldwide, as it has restricted student movement as a preventive measure. The teaching methodology impacted the medical education system globally, compelling the teacher to find out the effective online methods of teaching.

Aim: To know the level of satisfaction of first year medical students of Anatomy classes by YouTube recorded vs live online classes.

Materials and Methods: This was a descriptive cross-sectional questionnaire-based online survey (Google form) completed by 163 numbers of students of phase 1, attending the Department of Anatomy, Assam Medical College, Dibrugarh, Assam. This study was carried out by using a specially designed questionnaire consisting of points, which was related to the present curriculum in Anatomy, as well as the teaching methodology adopted during the COVID-19 pandemic in the institute. Then, levels of satisfaction perceived by the students on uploaded prerecorded classes on YouTube versus live classes on Zoom or Google meet were assessed in another questionnaire on a three-point scale: excellent, satisfactory, and neutral response. A Chi-square test for proportions was used to find out the statistical significance. A p-value of less than 0.05 was considered statistically significant.

Results: Uploaded prerecorded classes on YouTube was found excellent by 61.3% of students whereas classes on Zoom/ Google meet were reported to be excellent by 17.8% of students (p-value=0.0001). On the other hand, 66.3% of students found the live classes on Zoom/Google meet "satisfactory" against 36.8% of students who were satisfied with uploaded prerecorded classes on YouTube (p-value=0.0001). However, overall 160 (98.16%) students preferred uploaded prerecorded classes on YouTube (reported to be excellent or satisfactory), whereas 137 (84.05%) preferred live classes on Zoom/Google meet (p-value <0.05; 95% CI of differences: 8.19%-20.62%).

Conclusion: From perceptions received from students, it was understood that majority of the students were satisfied with prerecorded uploaded classes onYouTube.

INTRODUCTION

The World Health Organisation (WHO) declared the COVID-19 outbreak as a global pandemic, when the first case of coronavirus disease was detected in UK [1,2]. This COVID-19 pandemic has undoubtedly impacted the delivery of the medical education system with a sudden shifting from conventional offline or face-to-face teaching to online teaching mode [3]. Though online teaching is used frequently in higher education, it was not used as a teaching tool in medical education. But due to the nationwide lockdown in India since March 2020, all teaching institutes were instructed to continue courses through online mode. The medical education system was also not spared [4]. The concept of online teaching in medical education is very new but it has demonstrated several benefits in enhancing students learning in some foreign countries [5]. In terms of the outcome of the examination, both offline and online teachings are equally effective which has been suggested by a recent systematic review [6]. This unexpected COVID-19 pandemic compelled us to adopt the online teaching method, as this was the only tool left during this situation. The learning on the internet needs to be tailored to different learning styles in order to enable the teaching method to be impactful and effective [7]. Blended learning in preclinical years specially in Anatomy teaching is

beneficial for the generation accustomed to using YouTube, Zoom, Google meet etc., [8,9].

The new Competency-based Medical Education (CBME) curriculum encourages both traditional learning methods for early clinical exposure which will update the Indian Medical Graduate (IMG) to become better clinicians. However, this COVID-19 pandemic has hammered the curriculum for the first batch of CBME curriculum admitted in 2019. Thus, the medical faculties across India had to overcome the challenges to maximise the benefits of online education [10].

Various methods of taking online classes are available, starting from the traditional chalk and talk method to the modern Powerpoint Presentation (PPT) which can be used through different internet means and software. However, internet connectivity is also one of the factors to be considered as many of the students belong to remote areas having poor network coverage. Other factors like student understanding, better performance in the examination, etc. are also crucial. Because of the above difficulties, pros and cons, authors have chosen to use the prerecorded classes through YouTube application as a suitable means of teaching. The advantages of this method are manifold. Students can download the lectures and replay and discuss them even if they

fail to attend the classes in time due to various factors like poor internet connectivity.

Though similar studies have been available in the literature, in our geographical area, this was the first of its kind. Hence, the present study was conducted with an aim to know the different levels of perceptions of first year MBBS students (2019-2020 batch) on online classes through YouTube recorded sessions and live online classes regarding Anatomy.

MATERIALS AND METHODS

This was a descriptive cross-sectional questionnaire-based online survey conducted among the undergraduate first year medical students (2019-2020 batch) attending the department of Anatomy at Assam Medical College, Dibrugarh, Assam from June 2021-July 2021. Institutional Ethical Clearance was obtained prior to the study vide letter no AMC/EC/5935 dated 10th June 2021. Informed consent was taken from the study participants.

Inclusion and Exclusion criteria: All phase one students of the Anatomy of the 2019-2020 batch was included in the study. Those who were absent or refused to fill the questionnaire were excluded from the study.

Procedure

Out of 200 students, 163 responded to our queries; the rest of the students were reluctant to participate. Hence, those students were excluded from the study.

Questionnaire: This study was carried out by using a specially designed questionnaire consisting of points which were related to the present curriculum in Anatomy as well as the teaching methodology adopted during the COVID-19 pandemic in the institute. The students were briefed about the questionnaire and asked to respond freely and fearlessly. Students were provided with a questionnaire consisting of nine questions that were related to the teaching methodology adopted during the pandemic by using an online platform (Google form). The students were asked to submit their feedback comfortably without revealing their names, roll numbers, addresses, age, and sex. Hence, students could answer the questions freely in an unbiased manner.

Online classes:

- Theory classes were first recorded on the Zoom platform. A YouTube channel in the name of AMCANATOMY was created. Then, the recorded format was uploaded on YouTube.

- For histology classes, a device (mobile holder) was customised and attached to the microscope along with the mobile, where the eyepiece of the microscope and the mobile phone camera were in the same alignment. Mobile was connected to laptop and projector, and the slides were projected on a screen in enlarged view [Table/Fig-1]. This way classes were recorded and uploaded on the same YouTube channel.

- Osteology classes were recorded on mobile (Samsung Galaxy 21, the rear camera was 48 mp, the front camera was 28 mp) in the same way, by using another mobile holder which was also customised, and then the class was uploaded to the YouTube channel.

A total 163 number of students from the 2019-2020 batch participated in the study. Students' perceptions of online YouTube uploaded classes were assessed via the questionnaire in which students were asked to rank nine questions on a four-point scale: excellent, good, fair, and poor. The language of the questionnaire was English and 10 days were given to the students to fill up the questionnaire. Then, levels of satisfaction perceived by the students on uploaded prerecorded classes on YouTube versus live classes on Zoom or Google meet were also assessed on a three-point scale: excellent, satisfactory, and neutral.

[Table/Fig-1]: Device and the whole setup for histology classes.

Marks obtained by the students of this batch in Anatomy, in the last University exam were also recorded maintaining confidentiality, in order to assess the performance of the students after online classes.

STATISTICAL ANALYSIS

Data were presented in terms of frequency and percentages. A Chi-square test for proportions was used to find out the statistical significance. Statistical analysis was performed using Microsoft Excel. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Teacher-student interaction was also good as supported by 50.3% students. Again in the online classes, the lecture content was found to be informative as 52.8% and 40.5% of students have given "good" and "excellent" responses respectively. The majority of students (79.8%) felt that teacher's effort in the preparation and arrangement of classes was excellent, whereas only 1.2% of students felt it was poor. Histology slides were better understood and clearly visible, as a significant number of students (60.7%) responded "excellent" [Table/Fig-2].

Perception	Excellent n (%)	Good n (%)	Fair n (%)	Poor n (%)
Understanding of lectures when teacher upload the classes on Youtube	43 (26.4)	103 (63.2)	16 (9.8)	1 (0.6)
Teacher student interaction	17 (10.4)	82 (50.3)	47 (28.8)	17 (10.4)
Repetitive use of uploaded classes helps in better understanding	80 (49.1)	71 (43.6)	11 (6.7)	1 (0.6)
Lecture delivery found interesting	44 (27.0)	89 (54.6)	26 (16.0)	4 (2.5)
Lecture content found informative	66 (40.5)	86 (52.8)	8 (4.9)	3 (1.8)
Teachers' effort in preparation and arrangement of class	130 (79.8)	28 (17.2)	3 (1.8)	2 (1.2)
Demonstration of viscera are more informative and well organised	94 (57.7)	57 (35.0)	12 (7.4)	0 (0.0)
Histology slides can be better understood and clearly visible	99 (60.7)	54 (33.1)	7 (4.3)	3 (1.8)
Bones are described in better way in all anatomical aspects	70 (42.9)	75 (46.0)	14 (8.6)	4 (2.5)

[Table/Fig-2]: Perception of online YouTube classes of the study participants (N=163).

Uploaded prerecorded classes on YouTube were found excellent by 61.3% of students whereas classes on Zoom/Google meet was

reported to be excellent by 17.8% of students (p-value=0.0001). On the other hand, 66.3% of students found the live classes on Zoom/Google meet "satisfactory" against 36.8% of students who were satisfied with uploaded prerecorded classes on YouTube (p-value=0.0001). However, overall 160 (98.16%) students preferred uploaded prerecorded classes on YouTube (reported to be excellent or satisfactory), whereas 137 (84.05%) preferred live classes on Zoom/Google meet (p-value <0.05; 95% CI of differences: 8.19%-20.62%) [Table/Fig-3].

Satisfaction	Excellent n (%)	Satisfactory n (%)	Neutral n (%)
Uploaded prerecorded classes on YouTube	100 (61.3)	60 (36.8)	3 (1.8)
Live classes on Zoom or Google Meet	29 (17.8)	108 (66.3)	26 (16.0)

[Table/Fig-3]: Levels of satisfaction perceived by the study participants on recorded and live online classes N=163.
Neutral means the students were neither towards excellent nor towards satisfactory. This does not mean that the students did not respond

A good number of students (23) were able to score more than 80% marks in Anatomy. Only 12 (7.4%) numbers of students failed to achieve their goals [Table/Fig-4].

Percentages of marks obtained in Anatomy	No. of students	%
<50	12	7.4
50-59	35	21.5
60-69	48	29.4
70-79	45	27.6
≥80	23	14.1

[Table/Fig-4]: Marks Obtained in Anatomy of first year MBBS students (batch 2019-2020) in the last University examination N=163.

DISCUSSION

Students' opinions and feedback are the most important in changing over the teaching process from offline to online mode. This study investigated students' different perceptions regarding the different aspects of online classes in Anatomy. During this pandemic, handful of effort and time were spent in arranging and delivering the subject in all aspects through mode, as it was the only option left for delivering the classes around the world [3]. Teachers' effort in the preparation and delivery of the classes through YouTube received an "excellent" response from the maximum number of students (79.8%). A relatively high score of 3.36 for teacher preparation was also received by Samiullah D et al., in their study on 2721 medical students of 39 UK medical colleges during 2020. However, the quality of the delivered lectures may be impacted by poor internet connection, family distractions, and the timing [3].

During COVID-19 pandemic remote access is of particular importance and online learning helps in the delivery of learning materials quickly to students and can be updated from time to time [11,12]. As per the CBME curriculum, Classes on Early Clinical Exposures (ECE) for the first year MBBS students were a part of the curriculum, but because of e-learning, there was a lack of interaction with patients. This finding is similar to other recently published studies where students' perception of online classes was assessed by Thomas et al., Qarajeh et al., and Duc NTM et al., in 2020 [13-15].

In present study also, the classes were delivered via prerecorded mode on YouTube so, there was no question of eye contact between the teacher and the students and as we know that if the online methods are less interactive then they are less viewed. But the advantages of our method were, the students could view the classes repeatedly when required and also could put queries in the comment section. The teachers later on clarified all the doubts of the students. This way the classes were made interactive as well as interesting. There are different ways to increase the interactivity of online learning [16]. In a recent descriptive cross-sectional

questionnaire based online survey conducted in Nepal by Tuladhar SL et al., found that 67% of respondents rated the online classes were interactive, but 77.51% of respondents rated that the online classes were not effective [17]. In the present study, the classes were found interactive which was rated "good" by 50.3% and "fair" by 28.8%. Excellent and poor ratings shared equal proportions (10.4% each).

In another study conducted before the COVID-19 pandemic in 2011, Warnecke E and Pearson S, found that 92% of medical students found e-learning enjoyable, 95% found the online package useful and 75% perceived it to be effective in increasing their performance [18]. These authors suggested that e-learning should be utilised along with traditional face-to-face teaching in a blended learning environment. Overall, in the present study also, students accepted the online mode of learning as an effective tool which was reflected in the results of the final university examination.

Contradictory to our findings, another study conducted by Nitasha S et al., in Nepal observed that 73.93% of students enjoyed online learning only to some extent whereas 63.98% of students felt online classes were not equally effective as face-to-face teaching. The students had to face disturbance during online classes owing to internet disturbance and electricity problems [19].

Another study conducted by Subhangi G et al., (2020) in medical colleges of Delhi-NCR observed that 54.4% of students wanted online classes to be continued in addition to classroom teaching for the cognitive domain, and 16.9% of students prefer edit for both cognitive and psychomotor domain and 24.1% was not in favour of online classes. They also observed that the majority of the faculty members (65.2%) were in favour of including online teaching modules in the routine curriculum [20]. To gather more accurate results, a focus group discussion in collaboration with other medical colleges may be suggested for a future study.

Limitation(s)

The study was conducted in a single medical college from our region, which included small sample size, in order to generalise the findings.

CONCLUSION(S)

Students preferred uploaded prerecorded classes on YouTube (reported to be excellent or satisfactory). So, students' feedback is important, so that the facilitators can improve their way of teaching methods in the future. E-learning can be utilised along with offline classes in order to make it an effective hybrid blended learning technique in near future.

REFERENCES

[1] Moss P, Barlow G, Easom N, Lillie P, Samson A. Lessons for managing high-consequence infections from first COVID-19 cases in the UK. Lancet. 2020;395(10227):e46. Doi: 10.1016/S0140-6736(20)30463-3. PMID: 32113507.

[2] World Health Organisation. WHO announces COVID-19 outbreak a pandemic. [Online] World Health Organisation. Available: http:// www. euro. who. int/ en/ health- topics/ health- emergencies/ coronavirus- covid- 19/ news/ news/ 2020/ 3/ who- announces- covid- 19- outbreak- a- pandemic [Accessed 31 May 2020].

[3] Samuiullah D, Aleena M, Mai S, Aida A, Lana Al-N. Perceptions of medical students towards online teaching during the COVID-19 pandemic: A national cross-sectional survey of 2721 UK medical students. BMJ Open. 2020;10:e042378. Doi: https:// doi.org/10.1136/bmjopen-2020-042378. PMID: 33154063.

[4] Jagadish H, Rahul M, Sanjay W, Lokendra K. Perception of equivalence between online and face to face academic activities by undergraduate medical students during COVID-19 Pandemic. Inter J Dent Med Sci Res. 2020;2(4):115-20.

[5] Lochner L, Wieser H, Waldboth S, Mischo-Kelling M. Combining traditional anatomy lectures with e-learning activities: How do students perceive their learning experience? Int J Med Educ. 2016;7:69-74. Doi: 10.5116/ijme.56b5.0369. PMID: 26897012; PMCID: PMC4764246.

[6] Leisi P, Hongbin W. Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta- analysis. Med Educ Online. 2019;24(1):1666538. Doi: https://doi.org/10.1080/10872981.2019.1666538. PMID: 31526248.

[7] Evans DJR, Bay BH, Wilson TD, Smith CF, Lachman N, Pawlina W. Going virtual to support anatomy education: A STOPGAP in the midst of the Covid-19 pandemic. Anat Sci Educ. 2020;13:279-83. Doi: 10.1002/ase.1963. Epub 2020 May 5. PMID: 32277598.

[8] Khalil MK, Abdel Meguid EM, Elkhider IA. Teaching of anatomical sciences: A blended learning approach. Clin Anat. 2018;31(3):323-29. Doi: https://doi.org/10.1002/ase.1550. PMID: 29352730.

[9] Barry DS, Marzouk F, Chulak-Oglu K, Bennett D, Tierney P, O'Keeffe GW. Anatomy education for the YouTube generation. Anat Sci Educ. 2016;9:90-96. Doi: 10.1002/ase.1550. Epub 2015 Jun 9. PMID: 26061143.

[10] Nirav N, Shruti S, Nilesh F, Paul S, Nilesh P, Mono K, et al. Online medical education in India-Different challenges and probable solution in the age of COVID-19. Adv Med Educ Pract. 2021;12:237-43. Doi: https://doi.org/10.2147/AMEP.S295728. PMID: 33692645.

[11] Stain SC, Mitchell M, Belue R, Mosley V, Wherry S, Adams CZ, et al. Objective assessment of video conferenced lectures in a surgical clerkship. Am J Surg. 2005;189:81-84. Doi: https://doi.org/10.1016/j.amjsurg.2004.04.012. PMID: 15701498.

[12] Zehry K, Halder N, Theodosiou L. E-Learning in medical education in the United Kingdom. Procedia Soc Behav Sci. 2011;15:3163-67. Doi: https://doi.org/10.1016/j.sbspro.2011.04.265.

[13] Thomas A, Shenoy MT, Shenoy KT, Suresh Kumar S, Sidheeque A, Khovidh C, et al. Survey among medical students during COVID-19 lockdown: The online class dilemma. Int J Med Students. 2020;8:102-06. Doi: https://doi.org/10.5195/ijms.2020.571.

[14] Qarajeh R, Tahboub F, Rafie N. The effect of COVID-19 pandemic on US medical students in their clinical years. Int J Med Students. 2020;8:172-74. Doi: https://doi.org/10.5195/ijms.2020.508.

[15] Duc NTM, Tung PH, Dung H, Minh QT. COVID-19: Experience from Vietnam medical students. Int J Med Students. 2020;8:62-63. Doi: https://doi.org/10.5195/ijms.2020.505.

[16] Cook D, Steinert Y. Online learning for faculty development: A review of the literature. Med Teach. 2013;35:930-37. Doi: https://doi.org/10.5195/ijms.2020.505. PMID: 24006931.

[17] Tuladhar SL, Pradhan D, Parajuli U, Manandhar P, Subedi N. Study on the effectiveness of online classes for undergraduate medical and dental students of Gandaki Medical College during COVID 19 pandemic period in Nepal. Orthod J Nepal [Internet]. 2020;10(2):36-40.

[18] Warnecke E, Pearson S. Medical students perceptions of using e-learning to enhance the acquisition of consulting skills. Australasian Medical Journal. 2011;4(6):300-07. Doi: https://doi.org/10.4066/AMJ.2011.73. PMID: 23386892.

[19] Nitasha S, Chet Kant B, Sandip S, Rajeshwar RK. Perception towards online classes during COVID-19 among MBBS and BDS students in a Medical College of Nepal: A descriptive cross-sectional study. J Nepal Med Assoc. 2021;59(235):276-79. Doi: https://doi.org/10.31729/jnma.5348. PMID: 34506447.

[20] Subhangi G, Aashima D, Swarnim S, Devendra M. Medical education during COVID-19 associated lockdown. Faculty and students' perceptive. Medical Journal Armed Forces India. 2021;77:S79-S84. Doi: https://doi.org/10.1016/j.mjafi.2020.12.008. PMID: 33612936.

PARTICULARS OF CONTRIBUTORS:
1. Professor, Department of Anatomy, Silchar Medical College, Silchar, Assam, India.
2. Associate Professor, Department of Anatomy, Assam Medical College, Dibrugarh, Assam, India.
3. Associate Professor, Department of Anatomy, Assam Medical College, Dibrugarh, Assam, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Malamoni Dutta,
Associate Professor, Department of Anatomy, Assam Medical College,
Dibrugarh, Assam, India.
E-mail: malamonid@yahoo.in

AUTHOR DECLARATION:
• Financial or Other Competing Interests: None
• Was Ethics Committee Approval Obtained for this study?   Yes
• Was informed consent obtained from the subjects involved in the study?   Yes
• For any images presented appropriate consent has been obtained from the subjects.   Yes