

# Heart and Brain behind E-Learning amidst COVID19 Pandemic

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**Introduction:** COVID-19 pandemic presented us with a window to introduce digital learning in ophthalmology. We conducted this study to understand the repercussions of change of traditional learning and commence E-learning as an educational channel to medical students in the field of Ophthalmology and analyse the response of the students to the pristine method of education in this pandemic.

**Aim:** To determine the effect of COVID 19 lockdown on ophthalmic medical education in a private medical college in Navi Mumbai.

**Settings and Design:** A cross-sectional study done by recruiting undergraduates and BSc optometry students of a private medical college as the subjects, after obtaining ethical approval from the institute and informed consent from the students.

**Abstract** **Methods and Material:** A random sample of 322 undergraduate medical students; 151 from 7th semester, 151 from 5th semester and 20 from Third year Optometry were surveyed by a questionnaire. The Statistical Package AQ6 for the Social Sciences software used for statistical analysis.

**Results:** 70% students The response of 70% students was responded that online lectures covered all the important topics of curriculum and learning through phone was easier. Less than 45% students of 7th semester responded that online teaching should not remain a part of academic teaching when college reopens. The response of 112 students of 7th semester responded was that their parents complained about overusage of gadgets in this COVID19 pandemic. The response of 219 students was that they utilized COVID19 lockdown in a creative and constructive way apart from E-learning. **Conclusion:** E-learning can be an excellent appurtenance to traditional learning and hence enhance spread of medical knowledge worldwide.

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**Keywords:** E-Learning, Covid19 Pandemic, Medical Students

## Introduction

The COVID-19 pandemic presented us with a window to introduce digital learning in ophthalmology. All classes of the education system along healthcare centres and socio-economic status are smitten due to a reduction in manpower and measures to avert the outspread of the virus. Hospitals have acquired extreme changes to care structures, elective surgeries abandonment and re-distribution of healthcare workers.<sup>1</sup> We conducted this study to understand the repercussions of change of traditional learning and analyse the response of the students to E-learning as an educational channel to medical students in the field of Ophthalmology.

## Aim

The aim of the study is to determine the effect of COVID 19 lockdown on ophthalmic medical education in a private medical college in Navi Mumbai.

## Objectives

1. To study the merits and demerits of e-learning
2. Evaluate response of students to the virtual classroom
3. Psychological effect on students
4. Effect on family economy

## Subjects and Methods

All the MBBS students of 5th and 7th semester who attended ophthalmology online teaching classes and B.Sc Optometry students who attended ophthalmology online teaching

classes were included. Students who denied consent were excluded. A cross-sectional study was done from May 2020 to September 2020 by recruiting under graduates and BSc. optometry students of a private medical college as the subjects, after obtaining ethical approval from the institute and informed consent from who were the students. 322 under graduate and optometry students who were willing to participate were surveyed by a questionnaire. The questionnaire comprised of three sections; first comprised of questions to be answered on a scale of 0 to 10, second comprised of closed-ended questions in the form of Yes / No and the last section comprised of multiple choice questions (Figure 1, 2). The Statistical Package AQ 6 for the Social Sciences software was used for statistical analysis.

## Results

A total of 322 MBBS students and BSc. optometry students were surveyed, all belonging to the age group of 20–22 years. Of which these which, 136 were male students and 186 were female students. They were divided into three groups according to their semester and course. 151 students of 5th semester MBBS course, 151 students of 7th semester MBBS course and 20 third year BSc optometry students participated in this survey.

Of the 322, 170 students found that lack of patient exposure and lack of hands on experience affected their medical and practical knowledge by 93%. (Figure 3,Q3). About 115 students were 70% satisfied with the ophthalmic e-learning program conducted in this COVID19 lockdown. (Figure

**SECTION I: Answer the following on a scale of 0 to 10,**

1. Do you think the virtual class has negatively affected your theoretical experience during COVID19 pandemic?
2. How much does lack of practical experience hamper your understanding of the subject?
3. How much does lack of patient exposure affect your medical knowledge?
4. How much did lack of hands on experience of instruments and procedures affect your practical knowledge?
5. How difficult was it to ask doubts in virtual classroom?
6. During this pandemic, has the purpose of usage of gadgets become more educational?
7. How effective was the teaching by the instructor in the virtual classroom?
8. Did lack of teacher supervision affect your concentration and learning?
9. How satisfied are you with e-learning program conducted in COVID19 pandemic?
10. Did you experience any eyestrain due to online teaching?
11. How much did lack of physical support from peer group, isolation, fear associated with pandemic interfere with your mental health and ability to perform to full capacity?
12. How much has your screen time increased during this pandemic?
13. How much did e-learning affect your family economy?

**SECTION II: Answer the following as YES or NO?**

1. Did online lectures cover all the important topics of your curriculum?
2. Did virtual classroom make learning easier, easy to access and more enjoyable?
3. Were you interested or willing to participate in online lectures?
4. Did access to online lectures through phone make your learning easier?
5. Was absence of face-to-face interaction with the instructor a disadvantage for your learning?
6. Does lack of good internet connectivity, voice dropouts, access to laptop, etc hinder your education?
7. Did online teaching create more didactic environment?
8. Did learning at home improve your ability to concentrate?
9. Did online teaching save travel time and makes you more efficient?
10. Does online learning depend a lot on self motivation?
11. When college reopens, should online teaching remain a part of academic teaching?
12. Is e-learning an expensive medium of education?
13. Did your parents complain of overuse of gadgets during this COVID19 pandemic?

Figure 1: Questionnaire SECTION I and II

**SECTION III: Choose one of the given options :**

1. How did you spend your leisure time in this pandemic?
  - a) Gadget use
  - b) Books
  - c) Board games
  - d) Others
2. Did you use mobile phone or laptop for your e-learning?
3. Was e-learning Boring or enjoyable?
4. How is your mental state during this COVID19 pandemic?
  - a) Happy
  - b) Unhappy
5. How did you spend time in this COVID 19 pandemic?
  - a) Creative and constructive
  - b) Futile time over gadgets

Figure 2: Questionnaire SECTION III

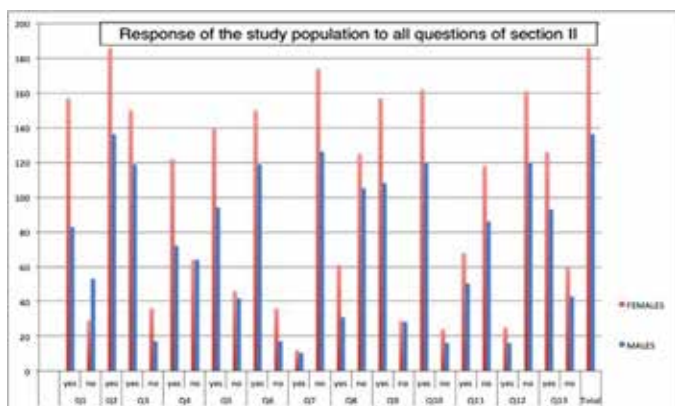


Figure 4: Response of the study population to all questions of Section II

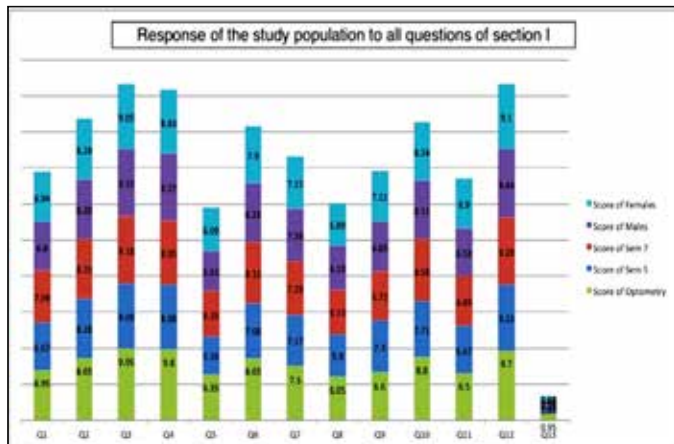


Figure 3: Response of the study population to all questions of Section I

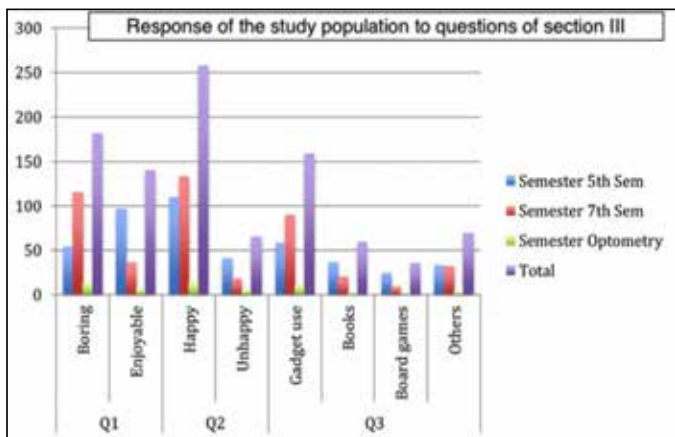


Figure 5: Response of the study population to all questions of Section III

3,Q9). A total of 176 students acknowledged that their screen time had increased by 93% in this lockdown (Figure 3,Q12), in which usage by male students was 94% and female students was 91%, as shown in Figure 3,Q12. E-learning requires usage of gadgets and good internet connectivity, 277 students responded that E-learning affected their family economy by 0.5%. (Figure 3,Q13). Around 240 students found that online lectures covered all the important topics of curriculum out of which 157 were females and 83 were males. Out of 240 students, 134 were from 5th semester, 98 were from 7th semester and 8 from optometry. Therefore, a statistically significant difference was noted between these groups with high frequency of response as 'YES' from females and 5th semester students ( $p < 0.01, 0.05$ ) (Figure 4).

Nearly, 194 students found that online lectures through phone made learning easier out of which 122 were females and 72 were males. Out of 194 students, 110 were from 5th semester, 76 were from 7th semester and 8 from optometry. Therefore, a statistically significant difference was noted between these groups with high frequency of response as 'YES' from females and 5th semester students ( $p < 0.01, 0.05$ ) (Figure 4). Out of 322 students, 146 students of 7th semester found that online teaching did not create more didactic environment. A statistically significant difference was noted between 5th semester, 7th semester and optometry students with high frequency of response as 'NO' from 7th semester

students ( $p < 0.01, 0.05$ ). There was no statistical difference observed between males and females of these groups. About 123 students of 7th semester found that learning at home did not improve overall ability to concentrate. A statistically significant difference was noted between 5th semester, 7th semester and optometry students with high frequency of response as 'NO' from 7th semester students ( $p < 0.01, 0.05$ ). There was no statistical difference observed between males and females of these groups. Around 127 students of 7th semester responded that online teaching should not remain a part of academic teaching when college reopens and 141 students responded that E-learning was not an expensive mode of education. A statistically significant difference was noted between 5th semester, 7th semester and optometry students with high frequency of response as 'NO' from 7th semester students ( $p < 0.01, 0.05$ ). There was no statistical difference observed between males and females of these groups (Figure 4). Around 112 students of 7th semester responded that their parents complained about overusage of gadgets in this COVID19 pandemic. A statistically significant difference was noted between 5th semester, 7th semester and optometry students with high frequency of response as 'YES' from 7th semester students ( $p < 0.01, 0.05$ ). There was no statistical difference observed between males and females of these groups (Figure 4).

Out of 322, 219 students utilized COVID 19 lockdown in a creative and constructive way apart from E-learning out of which 137 were females and 82 were males. Therefore, a statistically significant difference was noted between these students and students who utilized COVID 19 lockdown in a futile way. A statistically significant difference was noted between males and females of these groups with high frequency for creative and constructive way with females ( $p < 0.01, 0.05$ ). 182 students found E-learning conducted in this pandemic as boring. Out of 182, 115 students were from 7th semester, 54 were from 5th semester and 13 from optometry. Therefore, a statistically significant difference was noted between these groups with high frequency for boring than enjoyable with 7th semester students ( $p < 0.01, 0.05$ ) (Figure 5,Q1). About 257 students were mentally in the happy state in this pandemic. Out of 257, 133 students were from 7th semester, 110 were from 5th semester and 14 from optometry. Therefore, a statistically significant difference was noted between these groups with high frequency for happy than unhappy with 7th semester students ( $p < 0.01, 0.05$ ) (Figure 5,Q2). 90 students of 7th semester, 58 students of 5th semester and 11 students from optometry spent their leisure time over gadget usage rather than books, board games or others. Therefore, a statistically significant difference was noted between these groups with high frequency for gadget usage with 7th semester students ( $p < 0.01, 0.05$ ) (Figure 5,Q3).

### Discussion

In this pandemic, one of the main concerns is to continue to provide supreme education for residents and fellows of medical field. Educational measures were modified from traditional to virtual classroom to prevent lockdown of education. Various platforms like Zoom, Google meet have

escalated to be the supreme mode of education delivering the necessary coverage of syllabus for the current academic year. Regular lectures were held by the instructor with the help of visual presentations including videos and photographs over these online platforms; covering theory and practical aspects of the subject. Thereby, electronic learning classes are being used to prevent congestion, securing flow of education and the welfare of students. Good internet connectivity and availability of gadgets like mobile phone and laptop have become a must for procuring the benefits of e-learning. It makes learning easier, convenient, saves time and reduces the chances of contracting COVID19. E-learning is based on a lot of self-motivation, therefore it also enhances self-discipline and makes students responsible for their performance. E-learning has both its advantages and disadvantages. E-learning makes learning convenient, easier and enjoyable for students while it lacks the face to face interaction, supervision by the instructor, and mainly hampers the hands on experience which is a must for practical knowledge. In this pandemic, E-learning is the mainstay of medium of education and maintaining the spread of knowledge across the world.

In our study, we observed that 70% students were satisfied with the ophthalmic e-learning program conducted in this COVID19 lockdown. They found that all the important topics of their curriculum were covered and learning through phone was easier. However, 56% students found E-learning as boring because they could not meet and interact with their friends and colleagues. Fifty-three percent 53% students found that lack of patient exposure and lack of hands on experience affected their medical and practical knowledge. More than 45% students of 7th semester found that online teaching created more didactic environment. However, less than 45% students of 7th semester found that learning at home did not improve overall ability to concentrate and suggested that online teaching should not remain a part of academic teaching when college reopens. Since, 7th semester students need more practical exposure than the 5th semester students and optometry students, their response to E-learning was cynical and had a significant difference in response to other groups. Since the study population pertains to higher-socioeconomic status, we observed that family economy of 86% students was not affected by E-learning. 80% students were mentally in the happy state in this pandemic. 68% students of the study population utilized COVID 19 lockdown period in a creative and constructive way apart from E-learning; majority being females. 49% students spent their leisure time over gadget usage rather than books, board games or others. 55% students acknowledged that their screen time had increased by 93%. 35% students of 7th semester responded that their parents complained about overuse of gadgets in this COVID 19 pandemic. Hence, parents were worried and upset for their children due to superfluous use of gadgets.

Caroline et al organized a randomized controlled crossover study to assess E-Learning for the undergraduate ophthalmology teaching at medical school and found that



topics covered by E-Learning resulted in finer results in a mock examination, with much higher gratification ratings, compared with didactic lectures.<sup>2</sup> Seema et al conducted a cross sectional study in a private medical college in Maharashtra, India to introduce E-learning to third year medical students in the field of Ophthalmology. They concluded students accepted it and suggested that in all the subjects, E-learning should be used in adjunct to traditional learning.<sup>3</sup> Kaup et al submitted a letter to determine the role of online teaching learning to sustain academics in COVID19 pandemic which included the benefits of various electronic resources and strategies like e-seminars, case-based discussion, journal clubs, discussion on surgical techniques; clinico-epidemiological presentations, etc. They also discussed challenges towards the digital transformation of ophthalmic education like Clinical and surgical skill training, technology-related challenge and overload of information.<sup>4</sup> Chatziralli et al conducted a survey to highlight the importance of virtual learning in Ophthalmology during the COVID-19 pandemic era among the ophthalmologists and concluded that amidst the uncertainty, there are unique opportunities for residents and fellows to develop their knowledge. Such methods include various aids, such as exclusive meeting platforms, self learning and surgical counterfeit. They concluded that in coming years, E-learning might be used in ophthalmic education as an adjunct to traditional teaching.

Therefore, this study helped us to assess the merits and demerits of E-learning in COVID19 pandemic. The assessment of the outcome of E-learning and response of students to E-learning helped us to modify the teaching program and build a better educational system.

E-learning has not been fully accepted by undergraduate students of medical field in India and it may never be a replacement to traditional learning. E-learning can be an excellent appurtenance to traditional learning and hence enhance spread of medical knowledge worldwide. Success of E-learning is subject to amenability of students.

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