

Impact of COVID-19 on Academic Activities of Ophthalmology Postgraduates: A Cross-sectional Survey

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ABSTRACT

Introduction: Academics amid the lockdown in Coronavirus Disease-19 (COVID-19) outbreak have experienced massive reforms worldwide. This survey was conducted after the lockdown to evaluate its effect on academic activities in ophthalmology.

Aim: To assess the effect of lockdown and related restrictions on ophthalmology Postgraduate (PG) training programmes.

Materials and Methods: An online cross-sectional survey using google forms was designed and sent to postgraduates of ophthalmology Department across India through various social media platforms for one week. A total of 45 questions were included related to ophthalmology practice, clinical opportunities, surgical training and online teaching. Data was entered in Microsoft Excel software and descriptive statistics was used to describe the results.

Results: A total of 84 postgraduates were surveyed, out of which majority were from Karnataka (n=41) followed by Kerala (n=35).

Total 38 (45.2%) participants observed a reduction in Outpatient Department (OPD) patients and 78.6% decline in Operation Theatre (OT) procedures, 74 (88.10%) trainees required almost a month to restart OT and most of them 81 (96.43%) wore an N95 mask while operating. Nearly, 72 (85.7%) got Reverse Transcription-Polymerase Chain Reaction (RT-PCR) test as an additional investigation for all of their patients. Majority of the responders, 81 (96.4%) felt that the webinars were helpful.

Conclusion: This survey shows that majority of the ophthalmology postgraduates (mainly in Karnataka and Kerala) felt that the COVID-19 lockdown adversely affected their curriculum learning, especially the surgical training. Most of them benefited from the webinars and other online teaching programmes. Regulatory bodies should take a note of the issue and appropriate guidelines should be setup to optimise the training loss due to this pandemic.

Keywords: Coronavirus disease-19, Cataract training, Lockdown, Medical education, Surgical simulators, Wet lab

INTRODUCTION

Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV 2); also known as 2019 novel Coronavirus (2019 nCoV), the first case in India was reported on 30th January, 2020, in the state of Kerala in Southern India [1]. Medical education is undergoing a transformative change amidst the COVID-19 pandemic. With social distancing measures, educators have transitioned to web based learning platforms, to train future physicians globally. Live interactive webinars have been shown to be well perceived and effective for ophthalmology resident education [2].

The pandemic had a noteworthy influence on surgical training for residents mostly due to reduced surgical volume. As there were travel restrictions, no alternative surgical practice options were there for residents. Training needs to trust more deeply on virtual reality surgical simulators [3]. Loss of regular ophthalmic education, fear of being deskilled due to lack of surgical exposures has left the residents pondering about their future. This is mainly in regard with maintaining surgical competence and loss of regular ophthalmic education [4].

The present web survey was conducted to assess the impact of lockdown on academic activities of ophthalmology postgraduate training. Trainees were also asked about their opinion on alternative teaching methods (e.g., webinars) to provide guidance to develop relevant and appropriate support to train residents.

MATERIALS AND METHODS

A cross-sectional online survey was conducted using google forms among Indian ophthalmology postgraduate trainees. Google forms were sent via WhatsApp, Gmail, Telegram from 18th January 2021 to 24th January 2021 (one week) after receiving approval from the Institutional Review Board (DGCI Reg No. ECR/348/Inst/KA/2013/RR-16) for the study as well as the questionnaire.

The questionnaire was validated by a pilot test including 10 postgraduates, and the questionnaire was modified based on their feedback. With a Cronbach's value of 0.78, the study was proceeded. Postgraduates in ophthalmology were the target population. It was mandatory to answer all the questions. The participants were reminded once in 48 hours to encourage response. The questionnaire was based on experiences at the institute and also study done by Mishra D et al., [5].

Inclusion criteria: All those willing to participate in the survey, pursuing postgraduation in the Department of Ophthalmology were included in the study.

Exclusion criteria: Those who did not gave consent to participate in the study were excluded.

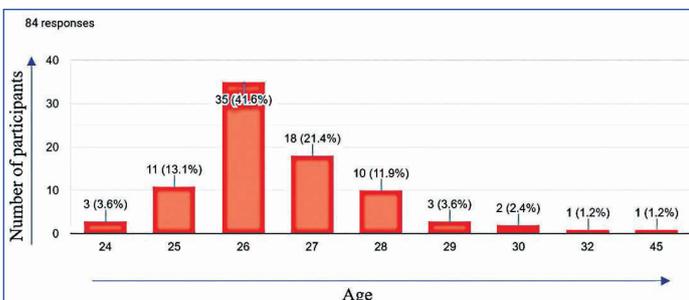
An invitation was created to participate in the study and circulated through various groups of social media, namely, WhatsApp, Gmail and Telegram. The survey which comprised of 45 questions [Appendix-1], open for one week. The survey was anonymised and did not contain any identifying information. Likert scale has been used to measure attitudes or opinions of the respondents [6].

STATISTICAL ANALYSIS

Data collected was entered in Microsoft Excel sheets. Data was compiled and presented as tables and diagrams. Collected data was summarised by frequency and percentages. Descriptive statistics was used to describe the results.

RESULTS

A total of 84 postgraduates pursuing ophthalmology participated in this study. The respondents were aged between 24 to 45 years, with mean age being 26.75±2.41 [Table/Fig-1], out of which (35/84) 41.7% were aged 26 years.



[Table/Fig-1]: Age wise distribution of participants.

Majority were from Karnataka 41 (48.8%) and Kerala 35 (41.6%) states. Total 34 (40.5%) were in their 3rd year, 31 (36.9%) in 2nd year and 19 (22.6%) in 1st year of postgraduation [Table/Fig-2].

Variable	Values number (%)
Sex	
Female	61 (72.6%)
Male	23 (27.4%)
State	
Karnataka	41
Kerala	35
Maharashtra	7
Andhra Pradesh	1
College name	
A.J. Institute of Medical Sciences, Karnataka	13
Anjarakandy Medical College, Kerala	6
Pariyaram Medical College, Kerala	6
Amrita Medical College, Kerala	6
Minto Ophthalmic Hospital, Karnataka	5
PK DAS Institute of Medical Sciences, Kerala	5
Jagadguru Jayadeva Murugarajendra Medical College, Karnataka	4
SDM College of Medical Sciences, Karnataka	3
Dr. Somervell Memorial CSI Medical College, Kerala	3
Kottayam Medical College, Kerala	3
Mahatma Gandhi Memorial Government Medical College, Indore	3
Kunhitharuvai Memorial Charitable Trust Group of Institutions Medical College, Kerala	3
Sri Devaraj URS Medical College, Karnataka	2
K.S. Hegde Medical Academy, Mangalore	2
Bharati Vidyapeeth University Medical College and Hospital, Maharashtra	2
Jubilee Mission Medical College and Research Institute, Kerala	2
Jawaharlal Nehru Medical College, Karnataka	2
Shimoga institute of medical sciences, Karnataka	1
Guntur medical college, Andhra Pradesh	1
Father Muller College, Mangalore	1
Government Medical College, Maharashtra	1
Mahadevappa Rampure Medical College, Karnataka	1
Governmental Medical College, Kerala	1
SS Institute of Medical Sciences and Research Centre, Bangalore	1
Mandya Institute of Medical Sciences, Karnataka	1
Kasturba Medical College, Mangalore	1
Basweshwar Teaching Hospital, Karnataka	1
Byramjee Jeejeebhoy Government Medical College, Maharashtra	1
Yenapoya Medical College, Karnataka	1
JSS Medical College, Karnataka	1
Kempegowda Institute of Medical Sciences College, Karnataka	1

Year of residency	
1 st	19 (22.6%)
2 nd	31 (36.9%)
3 rd	34 (40.5%)
Type of hospital	
Private	63 (75%)
Government	21 (25%)

[Table/Fig-2]: Demographics of the study subjects.

The number of OPD patients were mostly in the range of >50-100 before COVID-19 {35 (41.7%)} whereas after COVID-19 they were in the range of 10-50 {38 (45.2%)}. The OT procedures (mainly cataract surgeries) also saw a decline after COVID-19 from 10-50 {35 (41.7%)} to 0-5 {66 (78.6%)} per week. The teaching programmes which were greater than five classes per month {53 (63.1%)} reduced to 2-5 classes {40 (47.6%)} as observed by most of them.

Cancellation of camps had an impact on 73 (86.9%) postgraduates, to some extent on 6 (7.1%) and did not impact 5 (6%) of the graduates [Table/Fig-3].

Regarding surgical training [Table/Fig-4], summarises the effect of COVID-19 on surgeries and the problems faced due to it. [Table/Fig-5] puts together the challenges faced while working due to COVID-19.

Question	Before COVID-19 n (%)	During COVID-19 n (%)
Number of patients attending the OPD		
1-10	4 (4.8%)	31 (36.9%)
>10-50	21 (25%)	38 (45.2%)
>50-100	35 (41.6%)	11 (13.1%)
>100	24 (28.6%)	4 (4.8%)
Number of OPD procedures per week		
0-5	7 (8.3%)	44 (52.4%)
>5-10	14 (16.7%)	31 (36.9%)
>10-50	47 (56%)	8 (9.5%)
>50	16 (19%)	1 (1.2%)
Number of OT procedures assisted per week		
0-5	25 (29.8%)	66 (78.6%)
>5-10	21 (25%)	12 (14.3%)
>10-50	35 (41.6%)	6 (7.1%)
>50	3 (3.6%)	0
Number of OT procedures done independently per month		
0-5	37 (44%)	66 (78.6%)
>5-10	21 (25%)	11 (13.1%)
>10-50	21 (25%)	7 (8.3%)
>50	5 (6%)	0 (0%)
Number of casualty/emergency calls per week		
0-5	6 (7.1%)	29 (34.5%)
>5-10	28 (33.4%)	40 (47.6%)
>10-50	44 (52.4%)	15 (17.9%)
>50	6 (7.1%)	0
Number of teaching programmes		
0	0 (0%)	4 (4.8%)
1	4 (4.8%)	11 (13.1%)
2-5	27 (32.1%)	40 (47.6%)
>5	53 (63.1%)	29 (34.5%)
Did cancellation of camps have an impact on surgical training		
Yes		73 (86.9%)
No		5 (6%)
To some extent		6 (7.1%)

[Table/Fig-3]: Effect of COVID-19 on ophthalmology postgraduate training program.

Surgical	Number	Percentage
Time gap post COVID-19 of restarting OT		
One week	1	1.20%
Two weeks	2	2.40%
Three weeks	7	8.30%
More than a month	74	88.10%
Intraoperative surgical time (post resumption vs previous)		
No change	17	20.30%
Little change	32	38.10%
Significantly more	27	32.10%
Twice than before	8	9.50%
Satisfied with quality of surgery performed?		
Fully satisfied	15	17.90%
Satisfied but lesser as compared to before	39	46.40%
Not satisfied	30	35.70%
If not satisfied then, most appropriate reason?*		
Nervous to start	30	40.54%
Wanted to finish fast	6	8.10%
Patient uncomfortable with mask	11	14.86%
Not comfortable working with new protocols	27	36.48%
Respirator used during surgery		
Cloth	0	0
3-ply	1	1.20%
N95	81	96.40%
N99	2	2.40%
Mask provided to the patients		
Cloth	4	4.80%
3-ply	42	50%
N95	37	44%
N99	1	1.20%
Rate of complications experienced		
Almost similar as previous	41	48.80%
Slightly more	31	36.90%
High	10	11.90%
Significantly high	2	2.40%
Are you comfortable working in the present scenario?		
Comfortable	9	10.70%
Will get accustomed to it gradually	40	47.60%
Given a choice would not want to work under present condition	28	33.30%
Very uncomfortable/not working	7	8.40%
How many surgeries are you doing postlockdown (% of your previous)		
Not started	28	33.30%
<10%	23	27.40%
10-25%	19	22.60%
>25-50%	10	11.90%
>50-75%	3	3.60%
>75-100%	1	1.20%
Extra investigations undertaken preoperatively?		
Reverse Transcriptase-Polymerase Chain Reaction	72	85.70%
High Resolution Computed Tomography	2	2.30%
Chest X-ray	4	4.80%
Antibody test	2	2.40%
Not performing extra investigations	4	4.80%

[Table/Fig-4]: Effect of COVID-19 on surgical training.

*Multiple reasons by same responder

[Table/Fig-6] enumerates the survey details on online teaching programmes, on how useful the webinars were, the major problems

Challenges during/post lockdown	Number	Percentage
Preoperative workup of patient		
1	5	6%
2	7	8.30%
3	25	29.80%
4	26	30.9%
5	21	25%
Counselling of patients		
1	4	4.80%
2	2	2.40%
3	21	25%
4	30	35.70%
5	27	32.10%
Donning of PPE		
1	1	1.2%
2	6	7.14%
3	19	22.62%
4	29	34.52%
5	29	34.52%
Doffing of PPE		
1	1	1.20%
2	5	6%
3	19	22.60%
4	21	25%
5	38	45.20%
COVID-19 concerns within OT		
1	2	2.40%
2	1	1.20%
3	24	28.60%
4	26	30.9%
5	31	36.90%
Postoperative care of patients		
1	7	8.30%
2	7	8.30%
3	25	29.80%
4	20	23.80%
5	25	29.80%

[Table/Fig-5]: Challenges faced during/post lockdown on a scale of 1 to 5*.

*Likert scale: 1=least; 5=highest

faced during the webinars, the main interests of the trainees and which topic discussions they preferred.

Online teaching	Number	Percentage
Helpfulness of webinars		
Very helpful	16	19%
Helpful	36	42.90%
Somewhat helpful	29	34.50%
Not helpful	3	3.60%
Enhanced theory knowledge		
Yes	50	59.50%
No	9	10.70%
To some extent	25	29.80%
Helped for practical exam		
Very helpful	8	9.50%
Helpful	27	32.10%
Somewhat helpful	35	41.70%
Not helpful	14	16.70%

Satisfied with interaction with speakers asking doubts on chat box/posting on live FB or Youtube?		
Yes	35	41.67%
To some extent	32	38.1%
No	17	20.23%
Problems during online webinars		
Connectivity	48	57.10%
Voice drops	38	45.20%
Repeated topics	15	17.90%
Long lectures	42	50%
No problems	5	6%
What is your preferred device for attending webinars?		
Mobile	29	34.52%
Mobile, laptop, tablet, desktop	1	1.19%
Mobile, tablet, laptop	8	9.52%
Mobile, tablet	8	9.52%
Mobile, laptop	4	4.76%
Mobile, desktop	1	1.19%
Tablet, laptop	1	1.19%
Tablet	14	16.66%
Laptop	18	21.42%
Less than 30 mins	14	16.70%
30 minutes-1 hour	68	81%
1-2 hours	1	1.20%
>2 hours	1	1.20%
Factors to decide which webinar to attend		
Speakers list	38	45.2%
Panellists	16	19%
Duration	42	50%
Topics	69	82.1%
Timing of webinar	42	50%
Weekend	19	22.6%
Interested topics		
Basic sciences	32	38.10%
Para clinical	10	11.90%
Clinical	68	81%
Case presentation	70	83.30%
Attempting theory	36	42.90%
Attempting multiple choice questions	14	16.70%

[Table/Fig-6]: Online teaching during COVID-19*.

*(based on Likert scale)

DISCUSSION

The present survey shows how COVID-19 has impacted ophthalmology postgraduates and their surgical training concerns. While emergencies such as trauma qualified for emergency care, most of the other services such as cataract surgeries have seen a tremendous decline after COVID-19. Not surprisingly, in this survey 38 (45.2%) saw reduction in their OPD patients and 66 (78.6%) did less than five cataract surgeries per week. This negative trend was also seen in a survey conducted by Mishra D et al., where 80.7% (578/716) of the respondents agreed that they had a negative impact on their surgical training [5]. Nevertheless, the substantial reductions in volume present challenges for learners. While many may have gained confidence in their clinical abilities by this time of year, some may not have attained needed surgical numbers [7]. An 86.9% (73/84) trainees felt that cancellation of camps affected their training programme.

Reduced time in the clinical postings will adversely affect their clinical and surgical skill acquisition. Medical simulators may be useful in this scenario [8]. Training may now need to rely more heavily on virtual reality surgical simulators [9]. The results of this survey also

point out that ophthalmologists perceive that they are at a higher risk of contracting COVID-19 due to close physical contact nature of their work as 33.4% did not want to work under the present condition and 8.3% were not working.

A surge in the webinars and online Continuing Medical Education (CME) programmes has been seen since lockdown. In the present survey, 81 (96.4%) respondents found, the webinars to be helpful. Further, most of them agreed that it helped them to enhance their theory and practical knowledge. The results of a study done by Mishra D et al., also showed similar results with 75.7% (542/716) ophthalmology trainees finding webinars useful [5]. Likewise, in a study by Dasgupta S et al., webinars were considered a good academic tool by 77% (286/382) [10]. This growth of webinars, podcasts, and online symposia is allowing interaction, exchange of ideas and continuation of our education remotely. Residents may get advantage of online resources, from simulation exercises to narrated video libraries such as those presented by Eyetube and Cataract Coach, which have been growing in development and consumption [7].

Further, the demonstration of surgical procedures through live-surgery and edited video recordings has been gaining popularity in ophthalmology as it is known that the acquisition of both motor and cognitive skills can be achieved through observation [11]. These technology based tools have established advantages affecting positively on both learning effectiveness and audience satisfaction, such as the possibility to be recorded and/or stored online and the availability at a time and location convenient to the trainees [12].

The main strength of this study was the time when the data was collected as the comparison before and after COVID-19 could be better assessed by the participant, responses showed 100% completeness.

Limitation(s)

This study has a limitation of small sample size and responses from few states of the country, thus further studies with larger sample size will be more informative.

CONCLUSION(S)

Ophthalmic practices are bound to change post COVID-19 pandemic. The impact it has had on the ophthalmology trainees has to be dealt with. New technology based education tools for improving effective training must be introduced. Trainees agreed that the webinars and case discussions seem to be more effective tools for postgraduate training.

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APPENDIX 1

PROFORMA

Questionnaire Based Study:

1. Demographic data
 1. Age
 2. Sex
 3. College
 4. State
 5. City
 6. Year of residency
2. Type of hospital?
 1. Government
 2. Private
3. Before COVID-19 pandemic
 - i. Number of patients attending the OPD?
 - a. 1-10
 - b. >10-50
 - c. >50-100
 - d. >100
 - ii. Number of OPD procedures per week?
 - a. 0-5
 - b. >5-10
 - c. >10-50
 - d. >50
 - iii. Number of OT procedures assisted per week?(Cataract)
 - a. 0-5
 - b. >5-10
 - c. >10-50
 - d. >50
 - iv. Number of OT procedures done independently in one month?
 - a. 0-5
 - b. >5-10
 - c. >10-50
 - d. >50
 - v. Number of casualty/emergency calls per week?
 - a. 0-5
 - b. >5-10
 - c. >10-50
 - d. >50
 - vi. Number of teaching programmes conducted per month?
 - a. 0
 - b. 1
4. During COVID-19 pandemic
 - a. Number of patients attending the OPD?
 - i. 1-10
 - ii. >10-50
 - iii. >50-100
 - iv. >100
 - b. Number of OPD procedures per week?
 - i. 0-5
 - ii. >5-10
 - iii. >10-50
 - iv. >50
 - c. Number of OT assisted per week?(Cataract)
 - i. 0-5
 - ii. >5-10
 - iii. >10-50
 - iv. >50
 - d. Number of OT done independently in one month?
 - i. 0-5
 - ii. >5-10
 - iii. >10-50
 - iv. >50
 - e. Number of casualty/emergency calls per week?
 - i. 0-5
 - ii. >5-10
 - iii. >10-50
 - iv. >50
 - f. No of teaching programmes conducted per month?
 - i. 0
 - ii. 1
 - iii. 2-5
 - iv. >5
 - g. Time gap post COVID-19 when you restarted OT?
 - i. 1 week
 - ii. 2 weeks

- iii. 3 weeks or more
 - iv. More than a month
5. Surgical:
- a. Intraoperative Surgical Time (Post resumption vs Previous)
 - i. No change
 - ii. Little more
 - iii. Significantly more
 - iv. Twice than before
 - b. Satisfied with quality of the surgery performed?
 - i. Fully satisfied
 - ii. Satisfied but lesser as compared to before
 - iii. No satisfied
 - c. If not satisfied then, most appropriate reason?
 - i. Nervous to start
 - ii. Wanted to finish OT fast
 - iii. Patients uncomfortable with mask
 - iv. Not comfortable working with new protocols
 - d. Respirator used during surgery
 - i. Cloth
 - ii. 3 ply
 - iii. N95
 - iv. N99
 - e. Mask provided to the patients:
 - i. Cloth
 - ii. 3 ply
 - iii. N95
 - iv. N99
 - f. Rate of complications experienced
 - i. Almost similar as previous
 - ii. Slightly more
 - iii. High
 - iv. Significantly high
6. Are you comfortable working in the present scenario?
- 1. Comfortable
 - 2. Will get accustomed to it gradually
 - 3. Given a choice would not want to work under the present condition
 - 4. Very uncomfortable/not working
7. How many surgeries are you doing postlockdown (% of your previous)
- 1. Not yet started
 - 2. <10%
 - 3. 10-25%
 - 4. >25-50%
 - 5. >50-75%
 - 6. >75-100%
8. Extra investigations undertaken preoperatively?
- 1. RT-PCR
 - 2. High resolution computed tomography
 - 3. Chest X-ray
 - 4. Antibody test
 - 5. Not performing any extra investigations
9. Challenges during Postlockdown period
- a. Preoperative workup of patient?
 - i. 0-5
 - b. Counselling of patients
 - i. 0-5
 - c. Donning
 - i. 0-5
 - d. Doffing
 - i. 0-5
 - e. COVID concerns within OT
 - i. 0-5
 - f. Postoperative care of patient
 - i. 0-5
- Online teaching:**
1. How helpful were the webinars
 - a. Very helpful
 - b. Helpful
 - c. Somewhat helpful
 - d. Not helpful
 2. How it enhanced your theory knowledge
 - a. Yes
 - b. No
 - c. To some extent
 3. How it helped for your practical exam purpose
 - a. Very helpful
 - b. Helpful
 - c. Somewhat helpful
 - d. Not helpful
 4. Satisfied with interaction with speakers asking doubts on chat box/posting on live FB or YouTube
 - a. Yes
 - b. No
 - c. To some extent
 5. Major problems during online webinars
 - a. Connectivity
 - b. Voice drops
 - c. Repeated topics
 - d. Long lectures
 - e. No problems
 6. What is your preferred device for attending the webinar?
 - a. Mobile phone
 - b. Tablet
 - c. Laptop
 - d. Desktop
 7. Ideal duration for webinar
 - a. Less than 30 min
 - b. 30 min- 1 hour
 - c. 1-2 hours
 - d. >2 hours
 8. Factors helping you decide the webinar to attend
 - a. Speaker list
 - b. Topics
 - c. Panelists
 - d. Duration
 - e. Weekend
 - f. Timing of webinar
 9. Topics on which you would like the webinars on
 - a. Basic sciences
 - b. Para clinical
 - c. Clinical
 - d. Case presentation
 - e. Attempting theory
 - f. Attempting multiple choice questions