

Impact of COVID-19 Pandemic on Ophthalmology Trainees in Southern India - A Prospective Observational Study

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ABSTRACT

BACKGROUND

COVID-19, caused by a new strain of corona virus 2019-nCoV led to a global pandemic after first manifesting in humans in December 2019 in Wuhan, China. The government of India ordered a nationwide lockdown for 21 days, which was then extended. Hence, ophthalmology, being a branch which largely deals with elective surgeries, was majorly affected. We need to evaluate the impact of the COVID-19 crisis on ophthalmology trainees during pandemic in India.

METHODS

A prospective, observational study in which an online questionnaire (on Google forms) was circulated between 9th September and 15th September 2020 among ophthalmologists in training.

RESULTS

260 of the 550 training ophthalmologists who were approached responded. They were given 31 questions to answer. The average age of the respondents was 27.39 ± 1.92 years of which 72.69 % (189 / 260) were females. 68.08 % (177 / 260) of the respondents had been posted on COVID-19 related duties. 76.5 % (198 / 260) of the respondents agreed that the outpatient load had dropped to < 50 patients per day and 100 % (260 / 260) of the respondents stated that there had been a reduction in number of patients posted for elective surgery. As a result, 64.23 % (167 / 260) responded that it had led to a loss of interest in their daily activities. 74.23 % reported different levels of stress, 73.46 % reported anxiety and some 24.23 % even experienced sleep deprivation.

CONCLUSIONS

This study has demonstrated that majority of the training ophthalmologists were affected psychologically during the COVID-19 pandemic to varying degrees which included both groups of training ophthalmologists who did or did not perform any COVID related duties. The study therefore has highlighted the increased need for psychologists to identify and help these individuals who may suffer from severe depression, insomnia and high stress levels and provide the necessary help.

KEYWORDS

COVID-19, Pandemic, Psychological Impact, Ophthalmology Trainees

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DOI: 10.18410/jebmh/2021/337

How to Cite This Article:

*Warad C, Tenagi A, Wakankar A, et al.
Impact of COVID-19 pandemic on
ophthalmology trainees in Southern
India - a prospective observational study.
J Evid Based Med Healthc
2021;8(22):1786-1791. DOI:
10.18410/jebmh/2021/337*

*Submission 10-12-2020,
Peer Review 18-12-2020,
Acceptance 09-04-2021,
Published 31-05-2021.*

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BACKGROUND

COVID-19, a new strain amongst the class of corona virus, has been reported to have first manifested in humans in December 2019 in Wuhan, China subsequently triggering a global pandemic.¹ The first case in India came into notice on 30th January, 2020 and the number of cases increased enormously in March.² Following this, the government of India introduced a nationwide lockdown on 24 March 2020 lasting for 21 days, limiting movement of the entire 1.3 billion population of India as a preventive measure against the pandemic.³ Thousands of new cases of COVID-19 infections across the country were being reported every day and the figures were continuously rising.² More than 7, 52, 82, 798 people globally and 1, 44, 789 people in India alone have succumbed to this disease as of December, 2020.^{4,5} Since currently no drug or vaccine is available in Indian market against this virus, keeping social and physical distancing was deemed to be the preferred way to slow down the spread of this disease by interrupting the chain of transmission. Minimization of contact with infected surfaces, regular hand washing, compulsory mask wearing, physical distancing (at least 1 m), and avoiding crowding are a few of the measures that each and every individual was advised to incorporate in their routine lives.⁶

Resident doctors who are frontline warriors are at increased risk of contracting the disease. It not only affects the physical health but also the mental well-being of the people involved. Ophthalmology as a specialty is at an increased risk of contracting the disease as most of the procedures bring the ophthalmic equipment and ophthalmologists in close contact with the patient's eyes and face thus increasing the risk of spread of infection through aerosolized respiratory droplets and contact.⁷ Studies also suggest that the COVID-19 virus has been identified in tears and conjunctival swabs thus confirming the increased risk the ophthalmologists face. Ophthalmology as a specialty largely involves elective surgeries and hence as a result of lockdown and fear of exposure during pandemic, learning curve and surgical exposure of training ophthalmology residents has suffered greatly. Being enrolled for COVID-19 duty, took a further toll on the mental and physical health of many resident doctors. Situation was further complicated due to complete uncertainty; lack of proper guidelines; unprepared health infrastructure; and fear, anxiety, stigma, prejudice, and marginalization toward the disease.⁸

So, with this background, we have conducted this study to evaluate the impact of the COVID-19 pandemic on ophthalmologists in training using a validated questionnaire. It has been observed that health care professionals working at the front line feared contagious infection of their family, friends and colleagues and hence reported high levels of stress, anxiety and symptoms of depression.

METHODS

To study the impact of COVID-19 pandemic on ophthalmologists in training, an online survey was

conducted over 7 days from 9th September to 15th September 2020). A questionnaire (on Google forms) was circulated among ophthalmologists in training from different medical institutes, ophthalmic institutes and various hospitals. The identities of the participants have been kept anonymous for privacy purposes.

The protocol was approved by the JNMC Institutional ethics committee on human subjects' research, Belagavi and adhered to tenets of Helsinki Declaration. The factors that were considered included the demographics (age, gender), domicile (city, town), training programme (Diploma, DNB, MS, CPS) current year of training, nature of institute (Medical college, Ophthalmology institute, Multispecialty hospital), funding of institute (private, charitable), marital status (single, married).

The impact of COVID-19 was assessed based on the following parameters through a validated questionnaire consisting of 31 questions:

- Whether they were posted for COVID-19 related duties.
- If their clinical exposure / surgical training has been affected.
- If there was a delay in receiving stipend / salary.
- If a decrease in theoretical / classroom learning affected them.
- If the webinars / online teaching programmes have been more / less effective.
- Has there been negative impact on dissertation study / original article / publication related work.

The psychological impact was assessed as follows:

- If their personal routine has been affected.
- If there has been an increase in the amount of time spent on social media per day.
- If there has been a loss of interest in daily activities.
- If there has been an increase in their stress levels.
- If there has been an increase in anxiety levels related to ophthalmologic training / COVID-19 related duties.
- If they have been experiencing any sleep deprivation.
- If they have been having suicidal thoughts.

The psychological impact was assessed based on the above 7 questions and graded as depression of mild, moderate, severe grade.

Validity of the questionnaire was done using a pilot study. 30 subjects were asked to fill the questionnaire and inappropriate questions were removed from the questionnaire. Cronbach's alpha was used for reliability and was observed to be as 0.76.

Statistical Analysis

Data was analysed using statistical software R version 4.0.2 and Microsoft Excel. Continuous variables were represented by mean \pm SD / median (range) and categorical variables represented by frequency. To check the association between categorical variables chi-square test was used. P - value less than or equal to 0.05 indicated statistical significance.

RESULTS

Out of the 550 ophthalmology trainees that were approached for this survey, 260 valid responses were received which were tabulated and analysed. The respondents were given 31 questions which included demographic data and information about the effect of the pandemic on their wellbeing and state of mind. The average age of the respondents was 27.39 ± 1.92 years (Range 23 - 34 years) of which 72.69 % (189 / 260) were females. Of the respondents 68.5 % (178 / 260) were pursuing MS programs, 12.7 % (33 / 260) were pursuing Diplomats of the National Board (DNB) residency programs, 13.5 % (35 / 260) were pursuing Diploma in Ophthalmology programs and 16.2 % (42 / 260) were in fellowship programs. Majority of the respondents were enrolled in medical colleges (78.8 % - 204 / 260), 16.2 % (42 / 260) were from ophthalmic institutes and 5 % (13 / 260) were undergoing training at a multispecialty hospital. 78.8 % (204 / 260) of the trainees worked at an institute that had private funding and the rest were in charitable hospitals (21.2 % - 55 / 260). 68.3 % (177 / 260) of the respondents had been posted on COVID-19 related duties.

Out Patient Load and Surgical Exposure

A significant proportion of the respondents 98.46 % (256 / 260) agreed that the pandemic had led to a significant decline in the outpatient load of which 97.31 % (253 / 260) agreed that it had subsequently led to a reduction in their clinical training / exposure. Fig. 1 and Fig. 2 show the significant difference in patient load before and after the onset of the COVID-19 pandemic with 76.5 % (198 / 260) of the respondents agreeing that the outpatient load had dropped to < 50 patients per day.

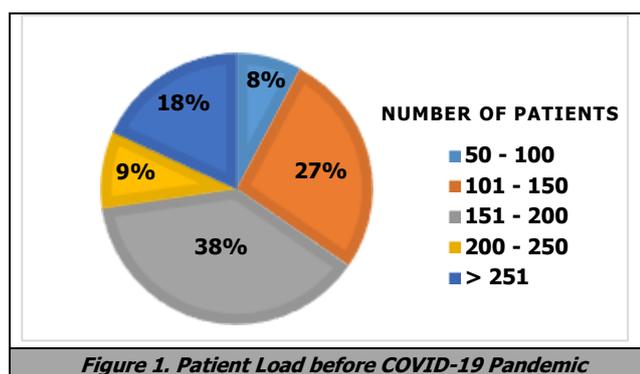


Figure 1. Patient Load before COVID-19 Pandemic

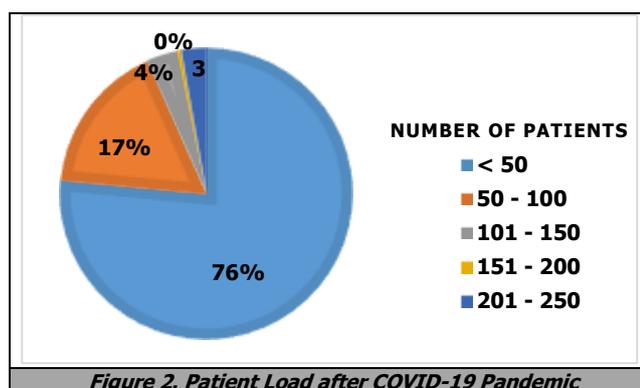


Figure 2. Patient Load after COVID-19 Pandemic

100 % (260 / 260) of the respondents stated that there had been a reduction in number of patients posted for elective surgery and it had affected their surgical training negatively (97.31 % - 253 / 260). In addition, 65 % (169 / 260) stated that they had not been receiving their stipend in a timely manner during the pandemic.

Effect of COVID-19 Pandemic on Academics

77.31 % (201 / 260) of the respondents agreed that there had been a decrease in theoretical and classroom learning. However, 86.92 % (226 / 260) responded that the online classes / webinars had proved helpful in the learning process during this time. 77.69 % (202 / 260) also indicated that their dissertations / publication work had been adversely affected due to the pandemic. 95.77 % (249 / 260) respondents had experienced an increase in worry about their professional training.

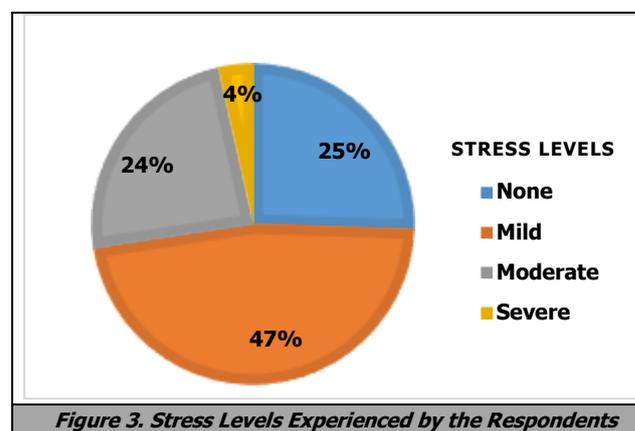


Figure 3. Stress Levels Experienced by the Respondents

Psychological Impact of COVID-19 Pandemic on Ophthalmology Trainees

When asked if the pandemic had led to a disruption and loss of interest in their daily activities, 84.6 % (219 / 260) and 64.2 % (166 / 260) respectively responded that it did. When asked if the pandemic had led to an increase in their stress levels, 25.38 % (66 / 260) responded it did not whereas the rest experienced different levels of stress as shown in Fig. 3.

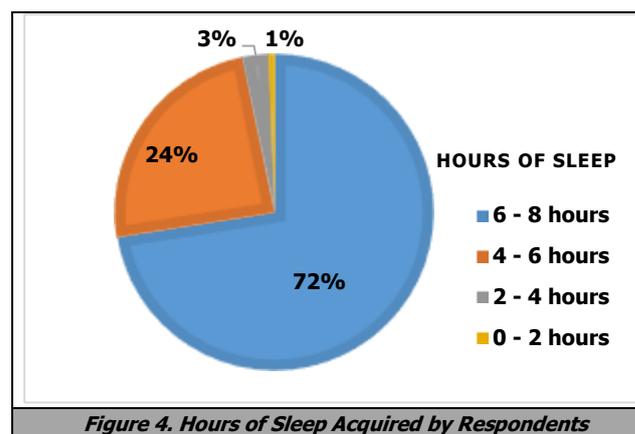


Figure 4. Hours of Sleep Acquired by Respondents

When questioned about an increase in anxiety levels, 24.23 % (63 / 260) responded negative and the rest

experienced different levels of anxiety as shown in Fig 4. In addition, 24.23 % (63 / 260) also experienced sleep deprivation with hours of sleep acquired depicted in Fig 4. 1.92 % (5 / 260) also revealed that they had suicidal thoughts. Lastly, 87.31 % (227 / 260) of the respondents stated that there had been an increase in time spent on digital device and social media during the pandemic.

Variables		Number of Subjects (%)
Age (in years)	23 - 25	40 (15.38 %)
	26 - 28	102 (39.23 %)
	28 - 30	103 (39.62 %)
	> 30	15 (5.77 %)
Gender	Female	189 (72.69 %)
	Male	71 (27.31 %)
Marital status	Married	59 (22.69 %)
	Single	200 (76.92 %)
	No response	1 (0.38 %)
Have you been posted for COVID-19 related duties?	No	82 (31.54 %)
	Yes	177 (68.08 %)
	No response	1 (0.38 %)
Has the Corona pandemic led to a decrease in patient load?	No	2 (0.77 %)
	Yes	256 (98.46 %)
	No response	2 (0.77 %)
If yes, has it reduced your clinical training/ clinical exposure?	No	5 (1.92 %)
	Yes	253 (97.31 %)
	No response	2 (0.77 %)
Is there a reduction in number of patients posted for elective surgery?	Yes	260 (100 %)
Were you receiving salary stipend in a timely manner during the pandemic?	No	169 (65 %)
	Yes	86 (33.08 %)
	No response	5 (1.92 %)
Has your personal routine been disrupted?	No	40 (15.38 %)
	Yes	220 (84.62 %)
Has it led to a loss of interest in your daily activities?	No	93 (35.77 %)
	Yes	167 (64.23 %)
Has there been a decrease in theoretical & classroom learning?	No	59 (22.69 %)
	Yes	201 (77.31 %)
Have the online classes/ webinars been helpful in the learning process?	No	32 (12.31 %)
	Yes	226 (86.92 %)
	No response	2 (0.77 %)
Has your dissertation study/original article/ case report publication work been adversely affected?	No	55 (21.15 %)
	Yes	202 (77.69 %)
	No response	3 (1.15 %)
Has the COVID-19 pandemic & lockdown increased worry about your professional training?	No	11 (4.23 %)
	Yes	249 (95.77 %)
Has there been an increase in your stress levels? if yes,	No	66 (25.38 %)
	Mild	122 (46.92 %)
	Moderate	62 (23.85 %)
	Severe	9 (3.46 %)
Have you been experiencing any sleep deprivation?	No response	1 (0.38 %)
	No	197 (75.77 %)
Has there been an increase in your anxiety levels?	Yes	63 (24.23 %)
	No	63 (24.23 %)
	Mild	138 (53.08 %)
	Moderate	50 (19.23 %)
Have you been having any suicidal thoughts?	Severe	3 (1.15 %)
	No response	6 (2.31 %)
	No	254 (97.69 %)
Has there been an increase in time spent on digital devices & social media?	Yes	5 (1.92 %)
	No	1 (0.38 %)
	Yes	33 (12.69 %)
Table 1. Analysis of Number and Percentage of Sub-Groups of Variables		

By using chi-square test, it was seen that there was significant association present between loss of interest in daily activity, study related activity, worry about professional training, stress level, anxiety levels and time spent on social media with COVID-19 duties.

		Have you been Posted COVID-19 Duties		P - Value
		No	Yes	
Were you receiving salary stipend in a timely manner during the pandemic?	No	23 (28.05 %)	63 (35.59 %)	0.3271#
	Yes	55 (67.07 %)	113 (63.84 %)	
	No response	4 (4.88 %)	1 (0.56 %)	
Has your personal routine been disrupted?	No	16 (19.51 %)	24 (13.56 %)	0.2175
	Yes	66 (80.49 %)	153 (86.44 %)	
Has it led to a loss of interest in your daily activities?	No	40 (48.78 %)	53 (29.94 %)	0.003288*
	Yes	42 (51.22 %)	124 (70.06 %)	
Has your dissertation study / original article / case report publication work been adversely affected?	No	27 (32.93 %)	28 (15.82 %)	0.001687#
	Yes	54 (65.85 %)	147 (83.05 %)	
	No response	1 (1.22 %)	2 (1.13 %)	
Has the COVID-19 pandemic & lockdown increased worry about your professional training?	No	7 (8.54 %)	4 (2.26 %)	0.02349* ^{MC}
	Yes	75 (91.46 %)	173 (97.74 %)	
Has there been an increase in your stress levels?	Mild	44 (53.66 %)	78 (44.07 %)	0.01149* ^{MC#}
	Moderate	24 (29.27 %)	38 (21.47 %)	
	No	10 (12.2 %)	55 (31.07 %)	
	Severe	4 (4.88 %)	5 (2.82 %)	
Have you been experiencing any sleep deprivation?	No response	0 (0 %)	1 (0.56 %)	0.2192
	No	66 (80.49 %)	130 (73.45 %)	
	Yes	16 (19.51 %)	47 (26.55 %)	
Has there been an increase in your anxiety levels?	Mild	48 (58.54 %)	90 (50.85 %)	0.003998* ^{MC#}
	Moderate	21 (25.61 %)	29 (16.38 %)	
	No	9 (10.98 %)	53 (29.94 %)	
	Severe	2 (2.44 %)	1 (0.56 %)	
Have you been having any suicidal thoughts?	No response	2 (2.44 %)	4 (2.26 %)	0.6772 ^{MC#}
	No	81 (98.78 %)	172 (97.18 %)	
	Yes	1 (1.22 %)	4 (2.26 %)	
Has there been an increase in time spent on digital devices & social media?	No response	0 (0 %)	1 (0.56 %)	0.02907*
	No	5 (6.1 %)	28 (15.82 %)	
Yes	77 (93.9 %)	149 (84.18 %)		

Table 2. Statistical Difference between Ophthalmology Trainees Posted Versus Those Not Posted for COVID-19

Abbreviations: MC: Monte Carlo's simulation used in chi square test, #: No response subjects Omitted while applying statistical test.

DISCUSSION

With the onset of the COVID-19 pandemic and lockdown since March 2020, health care workers including ophthalmologists have been assigned to work at the front line in the treatment of the people affected. As a result, they have directly been involved in the diagnosis, treatment, and care of patients with COVID-19 and are at risk of developing psychological distress and other mental health symptoms. The increasing number of confirmed and suspected cases, overwhelming workload, shortage of personal protective equipment, widespread media coverage, lack of specific drugs, and feelings of being inadequately supported may all contribute to the mental burden of these health care workers.⁷ Apart from direct exposure in the work environment it also affected the mental health of medical staff and infection of friends or close relatives generated psychological trauma 28/05/2021 12:34:00 28/05/2021 12:34:00.³ In our study a significant proportion of trainees (68.3 %) had been posted for COVID-19 related duties making them all the more vulnerable to contracting the disease themselves.

Ophthalmology Out-Patient Load and Surgical Exposure

It was seen that there was a dire need to strike a balance between the need to provide care and save sight and risk contracting COVID-19. Generally, elective visits and surgeries should be postponed and medical care provided only to urgent cases. A triage procedure should be performed to identify patients who should be urgently or emergently seen by the ophthalmologist versus those who may be safely rescheduled and those who may benefit from telemedicine or internet-based visit. As a result, a significant proportion of the respondents (99.2 %) of this study agreed that the pandemic had led to a significant decline in the outpatient load of which 98.1 % agreed that it had subsequently led to a reduction in their clinical training / exposure. 98.1 % of the respondents also stated that there had been a reduction in number of patients posted for elective surgery which had affected their surgical training negatively. Training institutes will have to adapt to conditions such as now when in-person didactics are cancelled, and surgical volume is significantly reduced. Residents and fellows may not be able to follow through their clinical rotations, complete the minimum required surgical cases and participate in patient care.¹

Academics in Ophthalmology

Studies have highlighted perceived and actual issues faced by ophthalmology residents due to time away from their training programmes. These included a perceived negative impact on training, the burden of covering colleagues without compensation (financial or time back), decreased resident well-being and performance.

In our study, 77.3 % of the respondents agreed that there had been a decrease in theoretical and classroom learning. However, 87.6 % responded that the online classes / webinars had proved helpful in the learning process during this time. 78.6 % also indicated that their dissertations / publication work had been adversely affected due to the pandemic. Due to this it was seen that 95.8 % respondents had experienced an increase in worry about their professional training.

Since the beginning of the lockdown, there has been a surge in the number of webinars and online CME programs in ophthalmology.¹ This practice has in addition been convenient for faculty and residents, who may be dispersed in satellite clinics or segregated teams, allowing lectures to start at more convenient times.⁹ Another advantage being virtual classes bringing with it a much larger audience and learning can happen from experts all over the globe. There are also many ophthalmic blogs with a huge number of image atlas and video galleries making ophthalmic learning interesting and fun.

It is essential to make these sessions interactive as it may otherwise be difficult for teachers to engage students due to issues like attention span, multi-tasking while attending sessions, poor audio and video quality, internet issues.¹⁰

However, in spite of all this virtual learning, hands-on training cannot be imparted by online teaching alone. This

problem can partially be handled by using online apps for simulation-based training but for ophthalmology this will always remain to be the biggest challenge.¹⁰

Psychological Impact on Ophthalmologists in Training

Our study surveyed anxiety levels among residents in ophthalmology and gaged their stress levels based on affection of their personal routine & loss of interest in their day to day activities. 54.3 % were found to have mild anxiety & 20.9 % moderate-severe anxiety. This showed a significant correlation to the number of hours of sleep obtained per day. The survey also assessed the various possible factors contributing to the stress & anxiety. Reduced clinical exposure and surgical training, rotation postings in COVID-19 related duties have all proven to be significantly associated to the stress & anxiety. The untimely manner of stipend / salary also seems to have a negative impact.

The current COVID-19 pandemic is predicted to stay for over a year or so. With a foreseen decrease in footfalls for availing eye care services, there is likely to be a sense of insecurity among these ophthalmologists. Depression was also higher in the trainees in ophthalmology as well as worry regarding professional growth. Hence, there is a dire need to seek psychiatric support and cognitive behavioural therapy by the residents to maintain their mental health. To help the current situation and as a precautionary measure, hospitals can collaborate with mental health professionals to provide the necessary support for those in need. Residents can be screened and diagnosed with common disorders such as anxiety & depression and managed at a primary level of care.¹¹

CONCLUSIONS

To summarize, our study has demonstrated that the majority of the training ophthalmologists was affected psychologically during the COVID-19 pandemic to varying degrees. This included both groups of training ophthalmologists who did or did not perform any COVID related duties. There is an increased need for psychologists to identify and help these individuals who may suffer from severe depression, insomnia and high stress levels and provide the necessary help at the earliest. This may include counselling services and development of support systems among colleagues.

COVID-19 pandemic has changed the way ophthalmology will be practised in the years to come and trainees must adapt accordingly. To make sure education does not suffer in this process, students must make good use of the various interactive webinars which, during the pandemic has proved useful for majority trainees enrolled in this study. It is prudent that health care professionals recognize the impact that this pandemic has and adapt accordingly. Even though the restrictions in place for limiting its spread are challenges for the Indian ophthalmic community, clear guidelines need to be evolved and followed

to help resume patient care without compromising on safety; both—their patients’ as well as their own.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.

Financial or other competing interests: None.

Disclosure forms provided by the authors are available with the full text of this article at jebmh.com.

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