

Psychological impact of COVID-19 on ophthalmologists-in-training and practising ophthalmologists in India

Rohit C Khanna^{1,2,3,4}, Santosh G Honavar⁵, Asha Latha Metla^{1,2}, Amritendu Bhattacharya⁶, Pallab K Maulik^{7,8,9}

Purpose: To evaluate the psychological impact of the COVID 19 crisis on ophthalmologists-in-training and practising ophthalmologists during lockdown in India. **Methods:** An online survey was completed by ophthalmologists and ophthalmology trainees during the lockdown. The information collected included demographics (age, gender), domicile (state, union territory), current professional status (in training or practising), type of practice (solo, group, institutional, governmental, non-governmental), marital status (married, single), impact of COVID-19 on their training or practice, and impact on income and ability to meet living expenses. Psychological distress was assessed using the Patient Health Questionnaire-9 (PHQ-9). **Results:** In all, 2,355 ophthalmologists responded. Mean age was 42.5 (range, 25-82 years; SD, 12.05) years. Of these, 1,332 (56.7%) were males; 475 (20.2%) were still not in practice; 366 (15.5%) were single; 1,244 (52.8%) felt that COVID-19 would impact on their training or professional work; and 869 (37%) had difficulty in meeting their living expenses. The mean PHQ-9 score was 3.98 (range, 0-27; SD, 4.65). In terms of psychological impact, 768 (32.6%) had some degree of depression; mild in 504 (21.4%), moderate in 163 (6.9%), and severe in 101 (4.3%). Multivariable analysis showed that depression was significantly higher at younger age. The odds of depression decreased by 3% with 1 year increase in age. It was higher in non-practising ophthalmologists, especially those who were considerably worried about their training or professional growth, and those with difficulty in meeting living expenses. **Conclusion:** A strikingly high proportion of ophthalmologists are psychologically affected and may require personalized mental health care.

Key words: Coronavirus, COVID-19, ophthalmologists, SARS COV-2, India

COVID-19 outbreak has affected millions globally.^[1] It not only affects the physical health of those infected by the virus, but also causes psychological impact, such as stress, anxiety, depression, insomnia, denial, anger, and fear. Psychological implications can be attributed to direct or indirect effects of the illness on livelihood and living conditions.^[1] Asymptomatic transmission of the disease causes fear and anxiety.^[2] In addition, lack of personal protective equipment (PPE) and social discrimination increase the stress and anxiety levels among health care professionals.^[2] The impact of COVID-19 on mental health of residents and health professionals in China is well studied.^[3-5] In a study to assess mental health status of medical and nursing staff in Wuhan, it was found that 36.9%

had subthreshold mental health disturbances, including 6.2% with severe disturbances.^[6]

COVID-19 has not only affected the mental health of frontline healthcare workers, but also other health care professionals who are not in the forefront, such as ophthalmologists. However, there are no reports on the mental health of other health care professionals who are not directly involved in COVID care. Ophthalmology as a specialty is at an increased risk as most of the procedures bring ophthalmologists in close contact with the patient's eyes and face. Various parts of the patient's face touch the ophthalmic equipment, thus increasing the risk of spread of infection through aerosolized particles from respiratory droplet and contact.^[7] There are also reports of SARS-CoV-2 identified in tears and conjunctival swabs, thus putting ophthalmologists at a risk of acquiring the infection.^[8-12] In a survey among health care professionals in Moorfield's Eye hospital, London, 80% of the respondents felt that they are at high risk of COVID-19 transmission.^[13] It is well known that stigmatization of health care professionals is very common during an epidemic.^[14] Hence, it is vital that we understand the impact of COVID-19 on the mental health of health care professionals, and design

¹Allen Foster Community Eye Health Research Centre, Gullapalli Pratibha Rao International Centre for Advancement of Rural Eyecare, LV Prasad Eye Institute, Hyderabad, ²Brien Holden Eye Research Centre, LV Prasad Eye Institute, Hyderabad, India, ³School of Optometry and Vision Science, University of New South Wales, Sydney, Australia, ⁴University of Rochester, School of Medicine and Dentistry, Rochester, NY, USA, ⁵Editor, Indian Journal of Ophthalmology, Centre for Sight, Hyderabad, India, ⁶Lead Biostatistician, The George Institute for Global Health India, ⁷Deputy Director and Director of Research, George Institute for Global Health India, New Delhi, ⁸Associate Professor, University of New South Wales, Sydney, Australia, ⁹Professor, Prasanna School of Public Health, Manipal, Karnataka, India

Correspondence to: Dr. Rohit C Khanna, L V Prasad Eye Institute, L V Prasad Marg, Banjara Hills, Hyderabad - 500 034, Telangana, India. E-mail: rohit@lvpei.org

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additional global strategies to provide appropriate mental health care.^[1] With this background, we designed this study to evaluate the psychological impact of the COVID 19 crisis on practising ophthalmologists in India during lockdown using a validated mental health questionnaire.

Methods

An online survey on mental health of ophthalmologists and ophthalmology trainees during lockdown was conducted over 4 days (April 15 to April 19, 2020), in collaboration with the All India Ophthalmological Society and Indian Journal of Ophthalmology. The survey was designed to understand the status of the mental health of ophthalmologists and possibly use the data to design policies and programs and provide useful solutions. The individual identity of the participants was kept anonymous and secure.

The protocol was approved by the Institutional Review Board of L V Prasad Eye Institute and adhered to tenets of Helsinki Declaration. The information that was collected included their demographics (age, gender), domicile (state, union territory), current professional status (in training or practising), type of practice (solo, group, institutional, governmental, non-governmental), marital status (married, single), impact of COVID-19 on their training or ophthalmology practice, and impact on income and ability to meet living expenses. For mental health, a validated Patient Health Questionnaire-9 (PHQ-9) was administered. PHQ-9 is a self-report measure that is used to assess the severity of depression over the prior 2 weeks.^[15] Response to the nine questions are graded as 0 (not at all), 1 (several days), 2 (more than half the days), and 3 (nearly every day). The total score of PHQ-9 that categorizes depression is as follows: minimal/no depression (0-4), mild depression (5-9), moderate depression (10-14), or severe depression (15-21).^[15]

Data were analyzed using STATA (version 13) software (Stata Corp, College Station, TX). For count data, frequencies and percentages were used. Baseline descriptive statistics included a comparison of the socio-demographic differences between those with depression (mild, moderate or severe) versus those without any depression; and the assessment was done using t-test or χ^2 tests. For risk factor of depression, multiple logistic regression models were used to calculate the odds ratio (OR) and 95% confidence interval for each risk factor. Variance inflation factors (VIF) were used to test for collinearity between the covariates after fitting a multiple regression model. The Hosmer–Lemeshow test for goodness of fit was used to assess the model fitness. The statistical significance was determined at $P < 0.05$ (two-tailed).

Results

The survey was completed by 2,355 ophthalmologists and ophthalmologists-in-training. Mean age was 42.5 (SD, 12.05; median, 40; range, 25-82) years. There were 1,332 (56.7%) males and 475 were still not in practice (20.2%). Among those who completed the survey, 358 (15.2%) were residents or fellows under training, 301 (12.8%) were working in government services, 1,224 (52.1%) were in private practice, and 466 (19.9%) were working in non-governmental sector. In terms of marital status, 366 (15.5%) were single. To a question on the effect of COVID-19 on their training or professional work, 1,244 (52.8%)

felt that COVID-19 would have considerable or serious effect on their training or profession. Regarding financial implications, 869 (37%) had difficulty in meeting their living expenses. The mean PHQ-9 score was 3.98 (range, 0-27; SD, 4.65). In all, 768 (32.6%) had some degree of depression; mild in 504 (21.4%), moderate in 163 (6.9%), and severe in 101 (4.3%).

Table 1 shows the sociodemographic differences between those with depression (mild, moderate, or severe) versus those without any depression. Depression was significantly higher in younger individuals, females, those not in practice, ophthalmologists-in-training, and those who were single. It was also significantly related to their concern about their training and profession, as well as their ability to meet living expenses.

Of the total respondents from all the states and union territories (UT), 1,851 (78.6%) belonged to 10 states and UT. Table 2 shows the distribution of different levels of depression in these 10 states and UT. Overall, there were 597 (32.2%) ophthalmologists with some level of depression in these 10 states or UT.

Table 3 shows the univariable and multivariable analysis of risk factors for depression. The univariate analysis showed that the significant predictors for depression were age, gender, marital status, practicing status, type of service, concern about setbacks in training, and concern about ability to meet expenses. In multivariable analysis, depression was significantly higher at younger age. The odds of depression decreased by 3% with 1 year increase in age. It was also higher in non-practicing ophthalmologists, as well as those who were considerably worried about their training or professional growth, and those with difficulty in meeting living expenses.

Discussion

Overall, we found that 765 (32.6%) had some degree of depression; mild: 504 (21.4%), moderate: 163 (6.9%) and severe: 101 (4.3%). This was much higher than the 10% prevalence for common mental disorders reported from general population in India.^[16] The high level of depression could be due to a generalized pervading climate of uncertainty among the ophthalmologists, triggered by the limitations in training and job security; fear factor as COVID-19 can cause severe symptoms in a segment of infected individuals; limited knowledge and availability of PPE; lack of adequate care in hospitals; and a shortage of ventilators and intensive care unit beds if someone were to contract the disease. It could also arise out of a fear of carrying infection to the family members at home, including the elderly and sick. There is also stigmatization targeting health care professionals as reported in the mainstream media. Finally, the entire situation has implications on the career in intermediate term, as the patient volume in most of the eye hospitals is expected to decrease significantly, thus impacting their financial sustainability and the quality of training. Among all the states and UT who responded, more than 75% belonged to 10 states and UT.

The proportion of respondents suffering from depression was higher than that in the community.^[16] This is of serious concern, as more than 11% suffer from moderate/severe depression that calls for clinical consultation with a mental health specialist. Depression was significantly higher in younger ophthalmologists and the odds decreased by 3%

Table 1: Sociodemographic differences between those with depression versus those without depression

Variables	Sub-group	No depression (n=1585)	Depression (n=765)	P
Age (Years): Mean (SD)		44.7 (12.1)	38.1 (10.7)	<0.001
Gender	Male	961 (72.2)	371 (27.8)	<0.001
	Female	624 (61.3)	394 (38.7)	
Practicing ophthalmologist	Yes	1363 (72.5)	517 (27.5)	<0.001
	No	224 (47.2)	251 (52.8)	
Type of services	In training	173 (48.3)	185 (51.7)	<0.001
	Government	189 (62.8)	112 (37.2)	
	Private	900 (73.5)	324 (26.5)	
	NGO	319 (68.5)	147 (31.5)	
Marital status	Married	1394 (70.1)	595 (29.9)	<0.001
	Single	193 (52.7)	173 (47.3)	
Worried about training or profession	Not at all	203 (80.9)	48 (19.1)	<0.001
	Somewhat	639 (74.4)	220 (25.6)	
	Considerable	564 (65.7)	295 (34.3)	
	Seriously	180 (46.8)	205 (53.2)	
Able to meet living expenses	Easily	1066 (71.8)	419 (28.2)	<0.001
	With difficulty	248 (58.4)	177 (41.7)	
	Barely	272 (61.3)	172 (38.7)	

Table 2: Top 10 states with highest number of respondents and their levels of depression

State/Union Territory	Levels of Depression				Total
	No	Mild	Moderate	Severe	
Andhra Pradesh	54 (63.5)	20 (23.5)	5 (5.9)	6 (7.1)	85
Delhi	129 (71.3)	38 (21)	5 (2.8)	9 (5)	181
Gujarat	134 (74)	36 (19.9)	8 (4.4)	3 (1.7)	181
Karnataka	171 (67.1)	53 (20.8)	22 (8.6)	9 (3.5)	255
Kerala	72 (72.2)	18 (18.2)	7 (7.1)	2 (2)	99
Maharashtra	257 (65.4)	105 (26.7)	18 (4.6)	13 (3.3)	392
Tamil Nadu	184 (70.2)	49 (18.7)	18 (6.9)	11 (4.2)	262
Telangana	91 (67.4)	26 (19.3)	9 (6.7)	9 (6.7)	135
Uttar Pradesh	87 (62.1)	26 (18.6)	17 (12.1)	10 (7.1)	140
West Bengal	75 (62.5)	23 (19.2)	17 (14.2)	5 (4.2)	120
Total	1254 (67.7)	394 (21.3)	126 (6.8)	77 (4.2)	1851

with every 1-year increase in age. There are reports on increased anxiety and depression symptoms in younger individuals, especially those in health care.^[17] It is likely that younger ophthalmologists are trying to establish themselves in their new practices and some of them may have loans to repay. With an anticipated 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 non-practicing ophthalmologists as well as those who worried more about their training or professional growth, and those with difficulty in meeting living expenses. Almost 40% had difficulty or were unable to meet their living expenses, indicating that financial burden could be a major cause for depression.

COVID-19 is going to stay for a long time in our community. This is likely to have a significant long-term impact on mental health of health professionals, and ophthalmologists in

particular. This issue needs to be addressed expeditiously, with an efficient and ongoing comprehensive action plan to protect their mental health. There is a need to establish psychological intervention teams to provide a range of psychological services, including pharmacological care.^[5] The ophthalmology society could link up with the psychiatric society or psychologists societies to come up with strategies to support those at increased risk. Hospitals and clinics could also setup collaborations with mental health professionals to provide support to those in need. Common mental disorders such as depression and anxiety can be easily diagnosed and managed even at a primary level of care using suitable evidence-based guidelines.^[18] Social media and print media should also play a positive role in spreading accurate information about the risk of the disease and work with health professionals to share information that is factual. The government should also develop strategies to address the mental health needs of all health care workers in a comprehensive manner. Steps should be taken to identify

Table 3: Univariable and multivariable logistic regression on risk factors for depression

Variables	Sub-group	Univariable Analysis		Multivariable Analysis	
		OR (95% CI)	P	OR (95% CI)	P
Age (Years): Mean (SD)		0.95 (0.94-0.96)	<0.001	0.97 (0.96-0.98)	<0.001
Gender	Male	Reference		Reference	
	Female	1.64 (1.37-1.95)	<0.001	1.13 (0.93-1.38)	0.22
Marital status	Married	Reference		Reference	
	Single	2.10 (1.67-2.63)	<0.001	1.19 (0.92-1.55)	0.19
Practicing ophthalmologist	Yes	Reference		Reference	
	No	2.95 (2.40-3.63)	<0.001	1.66 (1.09-2.51)	0.02
Type of services	Student	Reference		Reference	
	Government	0.55 (0.41-0.76)	<0.001	1.4 (0.88-2.21)	0.16
	Private	0.34 (0.26-0.43)	<0.001	1.03 (0.65-1.64)	0.9
	NGO	0.43 (0.32-0.57)	<0.001	1.18 (0.74-1.88)	0.7
Worried about training or profession	Not at all	Reference		Reference	
	Somewhat	1.46 (1.03-2.07)	0.04	1.09 (0.75-1.56)	0.66
	Considerable	2.21 (1.57-3.12)	<0.001	1.54 (1.07-2.21)	0.02
	Seriously	4.82 (3.32-7.0)	<0.001	2.75 (1.85-4.09)	<0.001
Able to meet living expenses	Easily	Reference		Reference	
	With difficulty	1.82 (1.45-2.27)	<0.001	1.65 (1.3-2.11)	<0.001
	Barely	1.61 (1.29-2.01)	<0.001	1.45 (1.14-1.84)	0.003

*OR: Odds Ratio; *CI: Confidence Interval; *NGO: Non-Governmental Organization

those who need immediate care and use robust and simple solutions to help them.

Our study had some limitations. As compared to face-to-face interview, self-reporting has its biases. The participants may understand and interpret the questions differently, which makes it difficult to correctly assess the accuracy of the responses. Also, of the 4,200 ophthalmologists in the country who accessed the survey, only 2,355 responded. It is likely that those who responded may be different from those who did not respond, thus skewing the results. Finally, the PHQ-9 questionnaire is best used as a screening tool only, which is a limitation. Though it gives cut-off scores that can be correlated to clinical severity, the actual diagnosis must be done using a clinical diagnostic tool administered by a clinician, and treatment should be based on that diagnosis.

Conclusion

In summary, the results demonstrated that a significantly high proportion of ophthalmologists were affected psychologically by the COVID-19 crisis. There is a need for personalized mental health care from psychologists and psychiatrists, especially for those with moderate/severe depression. This study showed that even the health workers who are not in the forefront of COVID-19 care and at less risk of being affected are suffering mental health consequences due to multiple factors. The national and state ophthalmology societies, health administration, and the government should be cognizant of the need to support the mental health of all the health care workers, and not only those in the frontline of the management of COVID-19 infection.

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Conflicts of interest

There are no conflicts of interest.

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