
Psychological impact of COVID 19 pandemic on practicing Egyptian ophthalmologists

Faried M. Wagdy¹, Tharwat H. Mokbel², Hadeer A. El Shebshery³, Zeinab A. Kasemy⁴, Abd-Almonem Al-hessy², Dina Abd Elfattah².

1- Department of Ophthalmology, Faculty of medicine, Menoufiya University, Egypt

2- Mansoura Ophthalmic Center, Mansoura University

3- Ophthalmology resident doctor at ministry of health, Tala Hospital, Menoufiya government, Egypt.

4- Department of Public Health and Community medicine, Faculty of Medicine - Menoufiya University, Egypt

Correspondence to: Faried M. Wagdy. Department of Ophthalmology, Faculty of medicine, Menoufiya University, Egypt. Email: fariedwagdy1976@gmail.com

Received: 2/2/2021, Accepted: 11/3/2021, Published online:11/3/2021

EJO(MOC) 2021;1:40-54.

Short title: Psychological impact of COVID 19 pandemic on ophthalmologists

Abstract:

Aim: To assess the psychological impact of the COVID 19 pandemic on practicing ophthalmologists in Egypt.

Methods: A cross-sectional study with convenience sampling technique was conducted on 300 ophthalmologists from July to September 2020 through personal interview and online questionnaires including data about i. Characteristics of the participants, ii. Medical and surgical procedures that have risk for transmission of COVID 19 and usage of protective precautions, iii. Generalized Anxiety Disorder Assessment (GAD), and iv. Patient Health Questionnaire-9 (PHQ-9).

Results: The study was conducted on 300 ophthalmologists distributed as 138 were male(46%) and 162 were females(54%). Symptoms of anxiety were reported in 93.3% while depression symptoms were reported among(72.7%) of the participants. Anxiety significantly increased among ophthalmologists who are married($p=0.001$), being resident doctor($P=0.001$), having been infected with COVID-19($P=0.034$) and knowing a colleague in the same specialty infected with COVID-19(0.001). Severe anxiety was significantly reported among those took all precautions against COVID-19($p=0.004$) and at the same time these precaution were uncomfortable($p=0.001$) where usage of face shield or slit lamp partition makes the examination difficult ($p=0.029,0.001$ respectively). Also severe anxiety was reported among those who decided to continue all infection control precaution incase COVID-19 continues($p=0.001$). Depression symptoms were significant among ophthalmologists who are married($p=0.001$), being resident doctor($P=0.001$), having been infected with COVID-19($P=0.004$) and knowing a colleague in the same specialty infected with COVID-19($P=0.003$). Severe depression was significantly reported among those considered precautions taken against COVID-19 were uncomfortable($p=0.018$) particularly slit lamp partition($P=0.002$), and also those used face mask > 2 hours, took all precautions and decided to follow the same precautions if COVID-19 still present ($p=0.041,0.018,0.030$ respectively).

Conclusion: COVID-19 pandemic had a great effect on young aged, married and resident, who taken much precautions and who are previously infected or knew a colleague infected with COVID-19. The psychological needs

for ophthalmologists in particular and health-care providers in general should be addressed appropriately during the pandemic. Effort should be made to established psychological support unit, especially for high risk healthcare providers.

Keywords: COVID-19, Anxiety and depression among Ophthalmologists, Healthcare workers

Introduction:

COVID-19 outbreak has affected millions globally. 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 The virus was first seen in China, countries in the European and American continents are the most affected.

The first case in Egypt was reported on 14 February 2020. Various precautions began being adopted as the number of cases increased, and a wide range of measures are still in place. As of 1 October 2020, the total number of reported cases in Egypt was 103198, with 5930 deaths².

Asymptomatic transmission of the disease causes fear and anxiety. In addition, lack of personal protective equipment (PPE) and social care professionals are associated factors³. The impact of COVID-19 on mental health of residents and health professionals in China is well studied⁴⁻⁶. In a study to assess mental health status of medical and nursing staff in Wuhan, it was found that 36.9% had sub-threshold mental health disturbances, including 6.2% with severe disturbances⁷.

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 contact⁸. There are also reports of SARS-CoV-2 identified in tears and conjunctival swabs, thus putting ophthalmologists at a risk of acquiring the infection⁹⁻¹³.

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 transmission¹⁴. In addition, ophthalmologists might be the first to encounter COVID-19 patients presenting with keratoconjunctivitis as the only and initial presenting symptom¹⁵. It is well known that stigmatization of health care professionals is very common during an epidemic¹⁶. Hence, it is vital that we understand the impact of COVID-19 on the mental health of health care professionals, and design additional global strategies to provide appropriate mental health care¹⁷. The aim of this study was to assess the psychological impact of the COVID 19 pandemic on practicing ophthalmologists in Egypt during lockdown using a validated mental health questionnaire.

Methods:

A cross-sectional study with convenience sampling technique was conducted on 300 ophthalmologists from July to September 2020 through personal interview and online questionnaires. Four questionnaires were used and they involved questions about:

- I. Characteristics of the participants; Age, gender, working days, etc.

II. Medical and surgical procedures that have risk for transmission of COVID 19 infection and usage of protective precautions: e.g. The instruments or medical devices that have more risk to transfer COVID-19 e, the surgical operation that have more risk to transfer COVID-19,

III. Generalized Anxiety Disorder Assessment (GAD-7) is used as a screening tool and severity measure for generalized anxiety disorder (GAD). The GAD-7 score is calculated by assigning scores of 0, 1, 2, and 3, to the response categories of 'not at all', 'several days', 'more than half the days', and 'nearly every day', respectively, and adding together the scores for the seven questions. Scores of 5, 10, and 15 are taken as the cut-off points for mild, moderate and severe anxiety, respectively. When used as a screening tool, further evaluation is recommended when the score is 10 or greater¹⁸. Using the threshold score of 10, the GAD-7 has a sensitivity of 89% and a specificity of 82% for GAD. It is moderately good at screening three other common anxiety disorders - panic disorder (sensitivity 74%, specificity 81%), social anxiety disorder (sensitivity 72%, specificity 80%) and post-traumatic stress disorder (sensitivity 66%, specificity 81%)¹⁹.

IV. Patient Health Questionnaire-9 (PHQ-9) is a self-report measure that is used to assess the severity of depression over the prior 2 weeks. 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)²⁰.

The questionnaires were chosen based on being easy to understand, less time taken and to the point and all these criteria were assessed through a pilot study where the questionnaires

were pretested on 20 participants (15 online and 5 personal interviews) to ensure its validity and feasibility. The online questionnaires were translated to help the participants to share. The personal interviews were interviewer-based questionnaires with the same language used for the online questionnaires to avoid any bias concerning understanding of the questions. After analysis of the questionnaires' feedback some modifications were performed such as reduction of its questions to avoid annoying participants by too much questions. The online recipients could forward the link to friends, in a snowball strategy. Anxiety and depression questionnaires had been previously validated.

Statistical analysis:

Data were analyzed using SPSS V.22. Descriptive statistics in the form of percentage (%), mean \pm SD, median and range were performed. Chi-square (χ^2) and Fisher's exact test were used for qualitative data. Odds ratios (OR) were used to assess risk of exposure (OR=1 nil, OR>1 Risky and OR<1 Protective). P value less than 0.05 was set as statistically significant.

Results:

The study was conducted on 300 ophthalmologists distributed as 138 were male (46%) and 162 were female (54%). The mean age was 36.1 \pm 6.64 years (range 25-58years). The participants were in varying levels in ophthalmology practice; the majority were residents (n = 160, 53.3%), and the remaining were fellows (n = 90, 30.0%), and consultants (n = 50, 16.7%). According to number of working hours/days, 284 ophthalmology physicians (82.7%) were working (>3) hours/day and 48.7% were working more than 3 days a week. The incidence of COVID-19 infection was reported among 17.3% of the studied ophthalmologists (17.3%) while 65% of the ophthalmologists reported knowledge of colleague being infected with COVID-19. The flow rate of patient during COVID-19 pandemic decreased as

reported by 65.7% of ophthalmologists which was mainly due to fear of getting infected from doctors and restriction due to country rules (37.6%).(Table 1)

Assessment of medical and surgical procedures that have risk for transmission of COVID 19 infection and usage of protective precautions revealed that 41.3% of the physicians spent 5 minutes for medical examination of the patients. For instruments that had more risk to transfer COVID-19, 66.3% of the physicians said both medical instruments and surgical instruments were risky instruments. Direct ophthalmoscope and surgical operation without surgical microscope were the most risky as reported by 85.7% and 90% of the physicians respectively while 61.7% said LASIK was the least risky surgical procedure to transfer COVID-19. When asking about the precautions taken, 46% have been taken. Precautions of applying sterilizer, wearing mask, social distance and, Slit lamp partition. But 60% of them said these precautions were not comfortable. Wearing mask continually for more than 2 hours was reported by 76.3%. Face shield and slit lamp partitions were reported to be comfortable by 58.7% and 86.7% respectively. While 72.7% of ophthalmology physicians felt upset 80.7% will follow the same precautions if COVID-19 present till end of year 2020.(Table 2)

Symptoms of anxiety were reported in 93.3% of the participants distributed as mild symptoms (27%), moderate symptoms (37%), and severe symptoms (29.3%). For depression symptoms, (72.7%) of the participants exhibited symptoms of depression, distributed as mild symptoms (36%), moderate symptoms, (18.7%) and severe symptoms (18.0%).(Table 3)

Anxiety significantly increased among ophthalmologists who are married ($p=0.001$), being resident doctor ($P=0.001$), having been infected with COVID-19 ($P=0.034$) and knowing a colleague in the same specialty infected with COVID-19 (0.001).(Table 4)

Severe anxiety was significantly reported among those who took all precautions against COVID-19 ($p=0.004$) and at the same time these precautions were uncomfortable ($p=0.001$) where usage of face shield or slit lamp partition makes the examination difficult ($p=0.029$, 0.001 respectively). Also severe anxiety was reported among those who decided to continue all infection control precautions in case COVID-19 continues ($p=0.001$) what makes them feel upset ($p=0.004$). (Table 5)

There was no significant difference regarding depression grades in relation to age, sex or working hours ($P>0.05$) but depression was significant among ophthalmologists who are married ($p=0.001$), being resident doctor ($P=0.001$), having been infected with COVID-19 ($P=0.004$) and knowing a colleague in the same specialty infected with COVID-19 ($P=0.003$). (Table 6)

Severe depression was significantly reported among those who considered precautions taken against COVID-19 were uncomfortable ($p=0.018$) particularly slit lamp partition ($P=0.002$) also those who felt upset during COVID-19 ($P=0.001$). There was no significant difference regarding usage of face shield ($P>0.05$). At the same time those who used face mask > 2 hours, took all precautions and decided to follow the same precautions if COVID-19 still present. (Table 7)

Table 1: Demographic data of the studied group

Variables	Studied group n = 300
Age/years	
Mean±SD	36.1±6.64
Min – Max	25 – 58
≤30 years	167(55.7)
> 30 years	133(44.3)
Gender	
Male	138(46.0)
Female	162(54.0)
Marital status	
Married	207(69.0)
Single	93(31.0)
Level	
Resident	160(53.3)
Fellow	90(30.0)
Consultant	50(16.7)
Number of working hours / day	
1 - 2 hours	12(4.00)
2 - 3 hours	40(13.3)
> 3 hours	248(82.7)
Days of work / week	
One day	11(3.70)
Two days	53(17.7)
Three days	90(30.0)
More than 3 days	146(48.7)
Previously infected with COVID-19	
Yes	52(17.3)
No	248(82.7)
Knowing a specialty colleague infected with COVID-19	
Yes	195(65.0)
No	105(35.0)

Data are presented as n (%)

Table 2: Frequency distribution of medical and surgical procedures that have risk for transmission of COVID 19 infection and usage of protective precautions.

Variables	Studied group n = 300	
	no	%
Average time for medical examination		
2 minutes	8	2.70
5 minutes	124	41.3
10minutes	114	38.0
> 10 minutes	54	18.0
The instruments that have more risk to transfer COVID-19		
Medical instruments	99	33.0
Surgical instruments	2	0.70
Both	199	66.3
The medical devices that have more risk to transfer COVID-19		
Direct ophthalmoscope	257	85.7
Indirect ophthalmoscope	3	1.00
Slit lamp	40	13.3
The surgical operation that have more risk to transfer COVID-19		
With surgical microscope	28	9.30
Without surgical microscope	272	90.7
Less risky surgical procedure to transfer COVID-19		
LASIK	185	61.7
LASIK and Phako	57	19.0
Oculoplastic surgery	13	4.30
All of the above	45	15.0
Precautions taken		
Sterilizer and mask	70	23.3
Sterilizer and mask and social distance	83	27.7
Slit lamp partition	9	3.00
All	138	46.0
Are these precautions		
Comfortable	120	40.0
Uncomfortable	180	60.0
The continuous period of using face mask		
< 1 hour	60	20.0
1 – 2 hours	11	3.70
> 2 hours	229	76.3
Usage of face shield		
Comfortable	176	58.7
Make the examination difficult	124	41.3
Usage of slit lamp partition		
Comfortable	40	13.3
Uncomfortable	260	86.7
This period of COVID-19 makes you feel		
Upset	239	79.7
Not disturbed	61	20.3
What to do if COVID-19 continues?		
Follow the same precautions	242	80.7
Return to usual work before COVID 19	8	2.7
I don't know	50	16.7

Table 3: Anxiety and depression among the studied group

Variables	Studied group n = 300	
	no	%
Anxiety symptoms		
Yes	280	93.3
No	20	6.70
Anxiety grades		
No	20	6.70
Mild	81	27.0
Moderate	111	37.0
Severe	88	29.3
GAD 7 score		
Mean \pm SD	7.35 \pm 5.42	
Min - Max	0 - 21	
Depression symptoms		
Yes	218	72.7
No	82	27.3
Depression grades		
No	82	27.3
Mild	108	36.0
Moderate	56	18.7
Severe	54	18.0
PHQ score		
Mean \pm SD	8.99 \pm 6.39	
Min - Max	0 - 27	

Data are presented as n (%)

Table 4: Relation between anxiety grades and demographic data of the studied participants

Variables	Anxiety grades				X2	P value
	No (n=20)	Mild (n=81)	Moderate (n=111)	Severe (n=88)		
Age/years						
≤30 years	15(75.0)	43(53.1)	60(54.1)	49(55.7)	3.36	0.339
> 30 years	5(25.0)	38(46.9)	51(45.9)	39(44.3)		
Gender						
Male	12(60.0)	36(44.4)	52(46.8)	38(43.2)	1.97	0.579
Female	8(40.0)	45(55.6)	59(53.2)	50(56.8)		
Marital status						
Married	12(60.0)	31(38.3)	88(79.3)	76(86.4)	54.4	0.001*
Single	8(40.0)	50(61.7)	23(20.7)	12(13.6)		
Level						
Resident	5(25.0)	30(37.5)	66(59.5)	59(67.0)	47.1	0.001*
Fellow	3(15.0)	33(40.7)	30(27.0)	24(27.3)		
Consultant	12(60.0)	18(22.2)	15(13.5)	5(5.70)		
Number of working hours / day						
1 - 2 hours	0(0.00)	1(1.20)	3(2.70)	8(9.10)	11.6	0.071
2 - 3 hours	1(5.00)	9(11.1)	16(14.4)	14(15.9)		
> 3 hours	19(95.0)	71(87.7)	92(82.9)	66(75.0)		
Days of work / week						
One day	0(0.00)	3(3.70)	5(4.50)	3(3.40)	12.6	0.178
Two days	1(5.00)	13(16.0)	20(18.0)	19(21.6)		
Three days	3(15.0)	21(25.9)	35(31.5)	31(35.2)		
More than 3 days	16(80.0)	44(54.3)	51(45.9)	35(39.8)		
Previously infected with COVID-19						
Yes	19(17.1)	8(9.90)	19(17.1)	23(26.1)	8.65	0.034*
No	92(82.9)	73(90.1)	92(82.9)	65(73.9)		
Knowing a specialty colleague infected with COVID-19						
Yes	15(75.0)	42(51.9)	71(64.0)	70(79.5)	19.2	0.001*
No	5(25.0)	39(48.1)	40(36.0)	18(20.5)		

Data are presented as n (%) * significant

Table 5: Relation between anxiety grades and usage of protective precautions

Variables	Anxiety grades				X2	P value
	No (n=20)	Mild (n=81)	Moderate (n=111)	Severe (n=88)		
Precautions taken						
Sterilizer and mask	9(45.0)	21(25.9)	23(20.7)	17(19.3)		
Sterilizer and mask and social distance	4(20.0)	22(27.2)	37(33.3)	20(22.7)		
Slit lamp partition	0(0.0)	0(0.0)	1(0.9)	8(9.1)	23.9	0.004*
All	7(35.0)	38(46.9)	50(45.0)	43(48.9)		
Are these precautions						
Comfortable	14(70.0)	31(50.6)	41(36.9)	24(27.3)	17.6	0.001*
Uncomfortable	6(30.0)	40(49.4)	70(63.1)	64(72.7)		
The continuous period of using face mask						
< 1 hour	2(10.0)	3(3.70)	1(0.90)	5(5.70)		
1 – 2 hours	3(15.0)	19(23.5)	23(20.7)	15(17.0)	6.83	0.337
> 2 hours	15(75.0)	59(72.8)	87(78.4)	68(77.3)		
Usage of face shield						
Comfortable	13(65.0)	58(71.6)	57(51.4)	48(54.5)	8.98	0.029*
Make the examination difficult	7(35.0)	23(28.4)	54(48.6)	40(45.5)		
Usage of slit lamp partition						
Comfortable	7(35.0)	18(22.2)	10(9.00)	5(5.70)	19.9	0.001*
Uncomfortable	13(65.0)	63(77.8)	101(91.0)	83(94.3)		
This period of COVID-19 makes you feel						
Upset	4(20.0)	50(61.7)	99(89.2)	86(97.7)		
Not disturbed	16(80.0)	31(38.3)	12(10.8)	2(2.30)	83.9	0.001*
What to do if COVID-19 continues?						
Follow the same precautions	14(70.0)	71(87.7)	89(80.2)	68(77.3)		
Return to usual work before COVID 19	3(15.0)	2(2.50)	3(2.70)	0(0.00)		
I don't know	3(15.0)	8(9.90)	19(17.1)	20(22.7)	18.8	0.004*

Data are presented as n (%), * significant

Table 6: Relation between depression grades and demographic data of the studied group

Variables	Depression grades				X2	P value
	No (n=82)	Mild (n=108)	Moderate (n=56)	Severe (n=54)		
Age/years						
≤30 years	45(54.9)	60(55.6)	27(48.2)	35(64.8)	3.11	0.375
> 30 years	37(45.1)	48(44.4)	29(51.8)	19(35.2)		
Gender						
Male	37(45.1)	55(50.9)	26(46.4)	20(37.0)	2.83	0.418
Female	45(54.9)	53(49.1)	30(53.6)	34(63.0)		
Marital status						
Married	32(39.0)	85(78.7)	46((82.1)	44(81.5)	47.6	0.001**
Single	50(61.0)	23(21.3)	10(17.8)	10(18.5)		
Level						
Resident	26(31.7)	58(53.7)	39(69.6)	37(68.5)		
Fellow	20(24.4)	40(37.0)	15(26.8)	15(27.8)	66.5	0.001**
Consultant	36(43.9)	10(9.30)	2(3.60)	2(3.70)		
Number of working hours / day						
1 - 2 hours	1(1.20)	5(4.60)	2(3.60)	4(7.40)		
2 - 3 hours	10(12.2)	14(13.0)	11(19.6)	5(9.30)		
> 3 hours	71(86.6)	89(82.4)	42(76.8)	45(83.3)	6.11	0.411
Days of work / week						
One day	2(2.40)	5(4.60)	2(3.60)	2(3.70)		
Two days	11(13.4)	17(15.7)	12(2.4)	13(24.1)	5.66	0.773
Three days	23(28.0)	33(30.6)	19(33.9)	15(27.8)		
More than 3 days	46(56.1)	53(49.1)	53(49.1)	24(44.4)		
Previously infected with COVID-19						
Yes	9(11.0)	13(12.0)	13(23.2)	17(31.5)		
No	73(89.0)	95(88.0)	43(76.8)	37(68.5)	13.3	0.004**
Knowing a specialty colleague infected with COVID-19						
Yes	47(57.3)	46(42.6)	46(82.1)	40(74.1)		
No	35(42.7)	62(57.4)	10(17.9)	14(25.9)	14.0	0.003**

Data are presented as n (%), **High significant

Table 7: Relation between depression grades and usage of protective precautions

Variables	Depression grades				χ^2	P value
	No (n=82)	Mild (n=108)	Moderate (n=56)	Severe (n=54)		
Precautions taken						
Sterilizer and mask	24(29.3)	22(20.4)	8(14.3)	16(29.6)		
Sterilizer and mask and social distance	25(30.5)	32(29.1)	16(28.6)	10(18.5)	20.0	0.018*
Slit lamp partition	0(0.0)	1(0.9)	3(5.40)	5(9.30)		
All	33(40.2)	53(49.1)	29(51.8)	23(42.6)		
Are these precautions						
Comfortable	49(59.8)	42(38.9)	15(26.8)	14(25.9)	21.9	0.001**
Uncomfortable	33(40.2)	66(61.1)	41(73.2)	40(74.1)		
The continuous period of using face mask						
< 1 hour	6(7.30)	1(0.90)	2(3.60)	2(3.70)		
1 – 2 hours	14(17.1)	30(27.8)	11(19.6)	5(9.30)	13.1	0.041*
> 2 hours	62(75.6)	77(71.3)	43(76.8)	47(87.0)		
Usage of face shield						
Comfortable	55(67.1)	56(51.9)	34(60.7)	31(57.4)	4.59	0.204
Make the examination difficult	27(32.9)	52(48.1)	22(39.3)	23(42.6)		
Usage of slit lamp partition						
Comfortable	21(25.6)	8(7.40)	6(10.7)	5(9.30)	15.1	0.002**
Uncomfortable	61(74.4)	100(92.6)	50(89.3)	49(90.7)		
This period of COVID-19 makes you feel						
Upset	42(51.2)	90(83.3)	54(96.4)	53(98.1)	62.9	0.001**
Not disturbed	40(48.8)	18(16.7)	2(3.60)	1(1.90)		
What to do if COVID-19 continues?						
Follow the same precautions	70(75.4)	83(76.9)	50(89.3)	39(72.2)		
Return to usual work before COVID 19	2(2.4)	6(5.6)	0(0.0)	0(0.0)	13.9	0.030*
I don't know	10(12.2)	19(17.6)	6(10.7)	15(27.8)		

Data are presented as n (%), * significant,**High significant

Discussion:

COVID-19 epidemic in Egypt is one of the most challenging bio-disasters, both at national and international public health levels in the last century. Healthcare providers across different specialties are facing tremendous psychological stress during this

pandemic. During the pandemic of H1N1, health-care providers felt unprotected, anxious, and exhausted while working in environments that carry a high risk of infection²¹.

Ophthalmologists are at a particular risk of virus transmission through contact or droplet routes

during slit lamp examination²². In our present study, the overall prevalence of anxiety was 93.3%, and depression was 72.7% respectively. A recent study was conducted in China during the pandemic of COVID-19, which reported an overall estimated prevalence of anxiety, depression, to be around 44.6, 50.4% respectively^{23,24}.

The current study showed marked higher prevalence of depressive symptoms in comparison to the universal range. During the pandemic of severe acute respiratory syndrome (SARS) in Taiwan, the reported prevalence of psychiatric morbidity was about 75% using the Chinese Health Questionnaire²³. In our study ophthalmologists aged ≤ 30 years were at higher risk of anxiety than those aged >30 around 56% , 44 % respectively, Ophthalmologists at Age ≤ 30 years were at higher risk of depression than those at Age >30 around 54.3% , 45.7% respectively. There are reports on increased anxiety and depression symptoms in younger individuals, especially those in health care²⁵. On the other hand the results were different from that reported in USA in response to a hypothetical influenza pandemic, which showed that age did not play a role in reporting stress during a pandemic²⁶.

Females are more prone to psychological distress. Anxiety and depression symptoms were significantly reported among females (55% and 53% respectively). This is consistent with several studies^{27-28,24-25}. Married participants experienced a markedly higher level of psychological distress, probably due to fear of transmitting the disease to more vulnerable family members. Different findings were reported in a study from Saudi Arabia ,Unmarried participants experienced a slightly higher level of psychological distress, probably due to the lack of social support and interpersonal communication²⁹.

Symptoms of depression were high in residents compared to fellows and consultants. In general, graduate and postgraduate medical trainees may

display some mental health concerns including depressive symptoms compared to more senior physicians³⁰⁻³¹. This high risk of depressive symptoms in the fellows compared to residents and consultants might be due to the fact that they are usually in transition between residency and seniority. In addition, fellows usually have a higher workload and more frequent contact with patients compared to others. Further studies are definitely needed to ascertain the real causes behind this finding and whether fellows are always having higher risk of depressive symptoms²⁹.

In this study, ophthalmologists were working long hours for several days were markedly at a high risk for anxiety and depression probably due to the more liability to be infected. Also anxiety and depression markedly increased in ophthalmologists who have been infected with COVID -19probably due to loneliness and financial problems related to the long period of isolation. Furthermore anxiety and depression markedly increased in ophthalmologists who knew a colleague in the same specialty infected with COVID-19 probably due to fear of facing the same fate.

Strengths and Limitations of study:

This study was conducted on critical group of physicians and we went in depth by asking about all work-related issues. But it also had some limitations like the convenience sampling technique chosen but it is difficult to apply sampling methods at this time because of the pandemic. Individuals without Internet and unable or unwilling to use smartphones or email could not be included in the study as face-to face interview was difficult to be done during the pandemic of COVID-19. Self-reporting has its biases as the participants may understand and interpret the questions differently, which makes it difficult to correctly assess the accuracy of the responses.

Conclusion:

COVID-19 pandemic had a great effect on young aged, married and resident, who taken much precautions and who are previously infected or knew a colleague infected with COVID-19. The psychological needs for ophthalmologists in particular and health-care providers in general should be addressed appropriately during the pandemic. Effort should be made to established psychological support unit, especially for high-risk health-care providers.

Ethics declarations

CONFLICT OF INTEREST

Hadeer A. El Shebshery, Zeinab A. Kasemy, Faried M. Wagdy, Tharwat H.Mokbel, Abd-Almonem Al-hessy, Dina Abd Elfattah, all authors have no conflicts of interest that are directly relevant to the content of this review.

FUNDING: No sources of funding were used to conduct this review.

Reviewer disclosures: No relevant financial or other relationships to disclose.

Declaration of interest: No financial affiliations or financial involvement with any organization or entity with a financial competing with the subject matter or materials discussed in the review.

References:

1. Torales J, O'Higgins M, Castaldelli-Maia JM, Ventriglio A. The outbreak of COVID-19 coronavirus and its impact on global mental health. *Int J Soc Psychiatry.* 2020 Jun;66(4):317-320.
2. Republic of Egypt Ministry of Health, 2020; <https://www.care.gov.eg/EgyptCare/Ind>
3. Dong L, Bouey J. Public mental health crisis during COVID-19 pandemic, China. *Emerg Infect Dis* 2020;26.
4. Zhang Y, Ma ZF. Impact of the COVID-19 Pandemic on Mental Health and Quality of Life among Local Residents in Liaoning Province,

- China: A Cross-Sectional Study. *Int J Environ Res Public Health.* 2020 Mar 31;17(7):2381.
5. Qiu J, Shen B, Zhao M, Wang Z, Xie B, Xu Y. A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: Implications and policy recommendations. *Gen Psychiatr* 2020;33:e100213
6. Kang L¹, Li Y, Hu S, Chen M, Yang C, Yang BX, et al. The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. *Lancet Psychiatry* 2020;7:e14
7. Kang L, Ma S, Chen M, Yang J, Wang Y, Li R, Yao L, Bai H, Cai Z, Xiang Yang B, Hu S, Zhang K, Wang G, Ma C, Liu Z. Impact on mental health and perceptions of psychological care among medical and nursing staff in Wuhan during the 2019 novel coronavirus disease outbreak: A cross-sectional study. *Brain Behav Immun.* 2020 Jul;87:11-17.
8. Van Doremalen N, Bushmaker T, Morris DH, Holbrook MG, Gamble A, Williamson BN, et al. Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. *N Engl J Med* 2020;382:1564-7.
9. Li JO, Lam DSC, Chen Y, Ting DSW. Novel coronavirus disease 2019 (COVID-19): The importance of recognising possible early ocular manifestation and using protective eyewear. *Br J Ophthalmol* 2020;104:297-8
10. Tong T, Lai TS. The severe acute respiratory syndrome coronavirus in tears. *Br J Ophthalmol* 2005 Mar;89(3):392..
11. Wu P, Duan F, Luo C, Liu Q, Qu X, Liang L, Wu K. Characteristics of Ocular Findings of Patients With Coronavirus Disease 2019 (COVID-19) in Hubei Province, China. *JAMA Ophthalmol.* 2020 May 1;138(5):575-578.
12. Seah IYJ, Anderson DE, Kang AEZ, Wang L, Rao P, Young BE, Lye DC, Agrawal R. Assessing

- Viral Shedding and Infectivity of Tears in Coronavirus Disease 2019 (COVID-19) Patients. *Ophthalmology*. 2020 Jul;127(7):977-979.
13. Xia J, Tong J, Liu M, Shen Y, Guo D. Evaluation of coronavirus in tears and conjunctival secretions of patients with SARS-CoV-2 infection. *J Med Virol* 2020 Jun;92(6):589-594.
14. Minocha A, Sim SY, Than J, Vakros G. Survey of ophthalmology practitioners in A&E on current COVID-19 guidance at three Major UK Eye Hospitals. *Eye (London, England)* 2020 Jul;34(7):1243-1245.
15. Cheema M, Aghazadeh H, Nazarali S, Ting A, Hodges J, McFarlane A, Kanji JN, Zelyas N, Damji KF, Solarte C. Keratoconjunctivitis as the initial medical presentation of the novel coronavirus disease 2019 (COVID-19). *Can J Ophthalmol*. 2020 Aug;55(4):e125-e129.
16. Shigemura J, Ursano RJ, Morganstein JC, Kurosawa M, Benedek DM. Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: Mental health consequences and target populations. *Psychiatry Clin Neurosci* 2020;74:281-2.
17. Torales J, O'Higgins M, Castaldelli-Maia JM, Ventriglio A. The outbreak of COVID-19 coronavirus and its impact on global mental health. *Int J Soc Psych* 2020;20764020915212.
18. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med* 2006;166(10):1092-7.
19. Kroenke K, Spitzer RL, Williams JB, Monahan P, Löwe B. Anxiety disorders in primary care: prevalence, impairment, comorbidity, and detection. *Ann Intern Med* 2007;146(5):317-25.
20. Kocalevent RD, Hinz A, Brahler E. Standardization of the depression screener patient health questionnaire (PHQ-9) in the general population. *Gen Hosp Psychiatry* 2013;35:551-5.
21. Matsuishi K, Kawazoe A, Imai H, Ito A, Mouri K, Kitamura N, Miyake K, Mino K, Isobe M, Takamiya S, Hitokoto H, Mita T. Psychological impact of the pandemic (H1N1) 2009 on general hospital workers in Kobe. *Psychiatry Clin Neurosci*. 2012 Jun;66(4):353-60.
22. Turgut B. Role of ophthalmologists in combating with the Coronavirus disease 2019. *Adv Ophthalmol Vis Syst* 2020;10:31-4..
23. Chong MY, Wang WC, Hsieh WC, Lee CY, Chiu NM, Yeh WC, et al. Psychological impact of severe acute respiratory syndrome on health workers in a tertiary hospital. *The British J of Psychiatry* 2004;185:127-33.
24. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, Wu J, Du H, Chen T, Li R, Tan H, Kang L, Yao L, Huang M, Wang H, Wang G, Liu Z, Hu S. Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. *JAMA Netw Open*. 2020 Mar 2;3(3):e203976.
25. Al-Rabiaah A, Temsah MH, Al-Eyadhy AA, Hasan GM, Al-Zamil F, Al-Subaie S, et al. Middle East Respiratory Syndrome-Corona Virus (MERS-CoV) associated stress among medical students at a university teaching hospital in Saudi Arabia. *J Infect Public Health* 2020;13:687-91
26. Balicer RD, Omer SB, Barnett DJ, Everly GS Jr. Local public health workers' perceptions toward responding to an influenza pandemic. *BMC Public Health*. 2006 Apr 18;6:99.
27. Alexander JL, Dennerstein L, Kotz K, Richardson G. Women, anxiety and mood: A review of nomenclature, comorbidity and epidemiology. *Expert Review of Neurotherapeutics*, 2007;7(11):45-58.
28. Zhong L, Luo W, Li M, Zhang Q, Liu G, Li T, Li Y. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: A

- quick online cross-sectional survey. *International Journal of Biological Sciences*, 2020;16(10):1745-1752.
29. Almater A, Tobaigy M, Younis A, Alaqeel M, Abouammoh M. Psychological effect of COVID-19 on ophthalmologists Middle East African Journal of Ophthalmology 2020;27:2.
30. Golob A, Beste LA, Stern M, Johnson K. Emotional distress among physician residents and fellows: An observational study of trainees seeking counseling visits. *Acad Psychiatry* 2017;42:25-30.
31. Mousa OY, Dhamoon MS, Lander S, Dhamoon AS. The MD blues: Under-recognized depression and anxiety in medical trainees. *PLoS One* 2016;11:e0156554.