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The perception and attitude of Turkish ophthalmologists related to the COVID-19 pandemic

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ABSTRACT

Aim: To investigate the level of perceptions and attitudes regarding COVID-19 among Turkish ophthalmologists in a tertiary eye care referral center.

Material and Method: A cross-sectional survey-based study including the sociodemographic form in addition to 52 multiple-choice questions was conducted in March 2021. The questions were to assess the perception of three concepts separately: The disease, the causes of COVID-19, and the control of COVID-19. Along with this, it also included questions to evaluate the attitudes of avoidance of COVID-19 and attitudes towards the COVID-19 vaccine.

Results: A total of 43 (15 males and 28 females) ophthalmologists completed the online survey. The perception of dangerousness and contagiousness was strong among ophthalmologists. The scores in the sub-dimensions of the perception of the causes of COVID-19 presented a moderate level. Statistically significant differences revealed between as follows: resident physicians and faculty in Macro Control (p=0.02), Controllability (p=0.38), and perception of the control of COVID-19 (p=0.022); males and females (p=0.009) along with resident physicians and faculty (p=0.023) in the behavioral avoidance attitudes from COVID-19; resident physicians and faculty in attitudes towards the COVID-19 vaccine (p=0.034).

Conclusion: COVID-19 was perceived as dangerous and contagious among ophthalmologists. The perception of the control of COVID-19 was stronger among faculty than resident physicians. Females and faculty developed higher behavioral avoidance attitudes from COVID-19. Faculty exhibited less negative attitudes than resident physicians towards the COVID-19 vaccine. These assessments could shed light on our path in combating the disease, both in the COVID-19 pandemic and in future outbreaks.

Keywords: Attitude, COVID-19, ophthalmologists, pandemic, perception

INTRODUCTION

Following the inception of atypical pneumonia cases of unidentified etiology on December 30, 2019, from the Hubei province of China; by January 7, 2020, a novel beta coronavirus was identified, while the disease has been named COVID-19 (1). Thereafter on March 11, 2020, The World Health Organization declared the COVID-19 outbreak a global pandemic (2).

The COVID-19 pandemic has considerably changed the way people live, act, and work in public and private life around the world. Measures such as hygiene and social behaviors were taken to contain the virus. Besides, more stringent and costly protection measures, such as school and store closures and stay-at-home orders were imposed by governments in most countries (3). Healthcare workers encounter a high risk of catching COVID-19, and their protection is vital for the supply of uninterrupted healthcare services together with averting the spread of the disease to other individuals. Ophthalmologists are no exception to this, and they are expressly susceptible (4). Nearness to the patients during the slit-lamp examination and ophthalmoscopy, the risk of spreading disease through asymptomatic individuals, and the possibility of contamination through the conjunctiva and tears are leading causes that pose a danger to ophthalmologists (5). In this regard; knowledge, perception of COVID-19 from different perspectives, and attitudes toward COVID-19 among ophthalmologists are the most crucial determinants in avoiding potentially lethal occupational hazards during the time of the pandemic.

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Dr. Li Wenliang who became aware of the impending disaster at the very beginning in China and alerted the local authorities to be taken the necessary actions was a young ophthalmologist. Unfortunately, he lost his life at age 34 due to respiratory failure thirty days after exposure (5). This example shows how ophthalmologists perceive the outbreak and develop an attitude that control and protection are precious in the management of the disease and the success of the fight against COVID-19. This study aimed to investigate the perception of the disease, causes of COVID-19, control of COVID-19 along with the attitudes of avoidance of COVID-19, and attitudes towards COVID-19 vaccine in Turkish ophthalmologists related to the pandemic in a tertiary eye care referral center.

MATERIAL AND METHOD

Study Design and Participants

A cross-sectional survey-based study was conducted in March 2021 in the course of partially eased COVID-19 restrictions and weekend curfews. The study population consisted of 43 ophthalmologists including academicians, specialists, and residents in a tertiary eye care referral center. Healthcare professionals other than ophthalmologists were excluded from the study.

Study Instrument

An online survey including the sociodemographic form in addition to 52 multiple choice questions divided into five scales regarding perception and attitudes (6) was conducted among ophthalmologists (please see supplementary material). The survey designed in the local language was constructed using Google Forms and the link of the survey was shared via WhatsApp groups or personally to participants in the contact lists of the investigators. The questions were to assess the perception of three concepts separately (please see supplementary tables S1, S2, and S3): The disease, the causes of COVID-19, and the control of COVID-19. Along with this, it also included questions to evaluate the attitudes of avoidance of COVID-19 and attitudes towards the COVID-19 vaccine (please see supplementary tables S4 and S5). Scales were in a five-point Likert structure. The expressions found were "Strongly disagree (1)", "Disagree (2)", "Undecided (3)", "Agree (4)", and "Strongly agree" (5)". Some expressions in the scales were reversely scored. This was taken into account in the analysis. Respondents had the option of adding their names and email addresses. However, this was not mandatory. The survey was available to participate in for 5 days.

The Perception of COVID-19 (P-COVID-19) scale had seven items and sub-dimensions of Dangerousness and Contagiousness. The high scores in both parts mean that the perception in that section is also higher. The Perception of Causes of COVID-19 (PCa-COVID-19) consisted of fourteen items and three sub-dimensions of “Conspiracy”, “Environment”, and “Faith”. High scores in each section reveal that the belief in that section is higher. The Perception of Control of COVID-19 (PCo-COVID-19) scale had twelve items and three sub-dimensions including the “Macro Control”, “Personal (Micro) Control”, and “Controllability”. High scores indicate the belief that control may be accomplished at a good level, or that the disease may be controlled with precautions. Avoidance Attitudes from COVID-19 (AA-COVID-19) scale had ten items including sub-dimensions of “Cognitive” and "Behavioral". High scores from each section show higher avoidance. Attitudes Towards the COVID-19 Vaccine (ATV-COVID-19) scale had 9 items. High scores in each sub-dimension of "Positive" and "Negative" attitude indicate the attitude towards vaccination is ‘’positive” or ‘’less” respectively.

Ethics

The study was carried out with the permission of Ankara City Hospital Clinical Researches Ethics Committee (Date: 2021, Decision No: E1/1990/2021). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. Informed consent details were obtained prior to the study commencement. Furthermore, a permit was also obtained for the study from the Directorate of Healthcare Services of the Ministry of Health. The survey of the study comprised an informed consent section declaring the aim of the study, the nature of the survey, study objectives, voluntary participation, declaration of confidentiality, and anonymity.

Statistical Analysis

The Statistical Package for Social Sciences (SPSS) 22.0 program was used for the data analysis. Descriptive statistics were shown in frequency, percentage, mean, and standard deviation values. Spearman's correlation test was used to measure the strength and direction of association between numeric variables. Mann–Whitney U and Kruskal-Wallis tests for paired comparisons and multiple comparisons respectively were used to analyze the non-parametric data. The statistical significance level was accepted as $p<0.05$ in analyses.

RESULTS

Demographic Profile of the Participants

A total of 43 (15 males and 28 females) ophthalmologists completed the online survey. The response rate of the survey was 61.4% (43 participated out of 70 invited ophthalmologists). The mean (SD) age of participants was 34.1 (9.05) years (range: 24–56 years). About 76.7% (n=33) were aged less than 40 years. Among the participants, 53.5% (n=23) were resident physicians, 34.9% (n=15) were

ophthalmology specialists, and 11.6% (n=5) were faculty of ophthalmology. 46.5% (n=20) of the participants had more than 5 years of occupational experience in the field of ophthalmology. The demographic profile of participants is presented in **Table 1**.

Table 1. Demographic profile of the participants.

Variables	Frequency (%)
n (%)	43 (100)
Age category (years)	
<25	1 (2.3)
25-30	20 (46.5)
31-40	12 (27.9)
41-50	6 (14.0)
51-60	4 (9.3)
Gender	
Male	15 (34.9)
Female	28 (65.1)
Experience in the field of ophthalmology (years)	
<5	23 (53.5)
5-10	5 (11.6)
11-15	8 (18.6)
16-20	2 (4.7)
>21	5 (11.6)
Current academic position	
Resident physician	23 (53.5)
Physicians & Attending physicians	15 (34.9)
Faculty	5 (11.6)

The Perception of the Disease, Causes of COVID-19, and Control of COVID-19

According to the survey, the disease was perceived as dangerous [13.1±(2.1) points (range: 7–15 points)] and contagious [16.1±(3.0) points (range: 4–20 points)] among ophthalmologists.

The mean±(SD) points of the perception of the causes of COVID-19 were 14.2±(5.2) points (range: 6–24 points) for "Conspiracy", 13.6±(3.9) points (range: 5–25 points) for "Environment", and 6.2±(2.5) points (range: 3–12 points) for "Faith" sub-dimensions respectively. The scores in the sub-dimensions of the perception of the causes of COVID-19 present a moderate level.

The mean±(SD) points of the perception of the control of COVID-19 were 10.7±(2.9) points (range: 4–16 points) for "Macro Control", 11.2±(2.9) points (range: 4–17 points) for "Personal (Micro) Control", and 14.1±(3.3) points (range: 8–20 points) for "Controllability" sub-dimensions respectively. According to academic status, there were statistically significant differences between resident physicians (mean rank=12.20 and 13.02) and faculty (mean rank=25.10 and 21.30) in Macro Control (p=0.02) and Controllability (p=0.38) sub-dimensions respectively along with the perception of the control of COVID-19 (p=0.022) in general (**Table 2**).

Table 2. Kruskal Wallis test analyses of COVID-19-related perceptions, attitudes, and sub-dimensions according to academic status.

Group	n= 23/15/5	Mean Rank	df	χ2	p Value	Significant Difference
Dangerousness	1	20.93	2	1.439	.487	-
	2	21.67				
	3	27.90				
Contagiousness	1	21.83	2	.167	.920	-
	2	22.83				
	3	20.30				
Conspiracy	1	21.11	2	.681	.712	-
	2	21.97				
	3	26.20				
Environment	1	25.09	2	3.435	.180	-
	2	17.43				
	3	21.50				
Faith	1	21.50	2	1.105	.575	-
	2	20.97				
	3	27.40				
Macro Control	1	16.48	2	12.368	.002*	3-1**
	2	25.73				
	3	36.20				
Personal Control	1	21.70	2	.162	.922	
	2	21.77				
	3	24.10				
Controllability	1	22.20	2	6.517	.038*	3-1**
	2	17.67				
	3	34.10				
Cognitive Avoidance	1	22.41	2	4.786	.091	
	2	24.80				
	3	11.70				
Behavioral Avoidance	1	17.72	2	7.566	.023*	3-1**
	2	24.83				
	3	33.20				
Positive Attitude	1	20.78	2	2.926	.232	-
	2	20.90				
	3	30.90				
Negative Attitude	1	21.37	2	6.060	.048*	3-1**
	2	18.80				
	3	34.50				
P-COVID-19	1	21.46	2	.152	.927	-
	2	22.23				
	3	23.80				
PCa-COVID-19	1	22.11	2	1.162	.559	-
	2	20.13				
	3	27.10				
PCo-COVID-19	1	19.26	2	7.654	.022*	3-1**
	2	21.43				
	3	36.30				
AA-COVID-19	1	18.85	2	3.292	.193	-
	2	26.20				
	3	23.90				
ATV-COVID-19	1	21.07	2	6.784	.034*	3-1**
	2	18.97				
	3	35.40				

*p<0.05 . ** Paired comparisons were made using the Mann-Whitney U test to determine which groups had a significant difference. df: degrees of freedom, χ2: chi-square, P: Disease Perception of COVID-19, PCo: Perception of Control of COVID-19, PCa: Perception of Causes of COVID-19, AA: Avoidance Attitudes from COVID-19, ATV: Attitudes Towards the COVID-19 Vaccine. 1: Resident Physicians, 2: Physicians & Attending physicians, 3: Faculty.

The Attitudes of Avoidance from COVID-19 and Towards COVID-19 Vaccine

The mean±(SD) points of the avoidance attitudes from COVID-19 were 11.02±(3.4) points (range: 5–20 points) for "Cognitive" and 20.3±(3.9) points (range: 5–25 points) for "Behavioral" sub-dimensions. There was a statistically significant difference (p=0.009) between males (mean rank=15.27) and females (mean rank=25.61) in the behavioral avoidance attitudes from COVID-19 (**Table 3**). The difference between resident physicians (mean rank=12.74) and faculty (mean rank=22.60) in the behavioral avoidance attitudes from COVID-19 was also statistically significant (p=0.023).

Table 3. Mann Whitney U-test result of gender according to perception, attitude, and sub-dimensions.

Scale	Group	Mean Rank (Male=15/Female=28)	p value
P			
	Dangerousness	19.17/23.52	.251
	Contagiousness	19.63/23.27	.359
PCa			
	Conspiracy	26.00/19.86	.125
	Environment	21.50/22.27	.847
	Faith	22.27/21.86	.917
PCo			
	Macro Control	18.13/24.07	.136
	Personal Control	20.30/22.91	.512
AA			
	Controllability	18.20/24.04	.144
	Cognitive Avoidance	22.87/21.04	.722
	Behavioral Avoidance	15.27/25.61	.009*
ATV			
	Positive Attitude	19.00/23.61	.245
	Negative Attitude	18.67/23.79	.200
Total Scores			
	P-COVID-19	19.30/23.45	.300
	PCa-COVID-19	24.83/20.48	.278
	PCo-COVID-19	17.40/24.46	.078
	AA-COVID-19	18.23/24.02	.147
	ATV-COVID-19	18.93/23.64	.238

*p<0.05. M: male, F: female, P: Disease Perception of COVID-19, PCo: Perception of Control of COVID-19, PCa: Perception of Causes of COVID-19, AA: Avoidance Attitudes from COVID-19, ATV: Attitudes Towards the COVID-19 Vaccine.

The mean±(SD) points of the attitudes towards the COVID-19 vaccine were 17.09±(3.3) points (range: 4–20 points) for "Positive" and 18.7±(3.6) points (range: 8–25 points) for "Negative" (higher scores in this sub-dimension signify that the negative attitude towards vaccination is less) sub-dimensions. Depending on academic status, there were statistically significant differences in the sub-dimension of negative attitude towards vaccination (p=0.048) along with the attitudes towards the COVID-19 vaccine (p=0.034) in general. Faculty (mean rank=22.40 and 21.30) exhibited less negative attitude than residents physicians (mean rank=12.78 and 13.02) towards the COVID-19 vaccine in general and the sub-dimension of "Negative" respectively.

The Correlations Between Sub-dimensions of the Scales

Spearman's correlation tests unveiled significant positive linear correlations as follows: Dangerousness and Controllability (r =0.363; p=0.017), Behavioral Avoidance Attitude (r =0.462; p=0.002), Positive Attitude towards COVID-19 vaccine (r =0.404; p=0.007), Negative Attitude towards COVID-19 vaccine (r =0.466; p=0.002); Contagiousness and Behavioral Avoidance Attitude (r =0.418; p=0.005), Positive Attitude towards COVID-19 vaccine (r =0.360; p=0.018); Faith and Personal (Micro) Control (r =0.375; p=0.013); Macro Control and Age (r =0.496; p=0.001); Controllability and Behavioral Avoidance Attitude (r =0.415; p=0.006); Behavioral Avoidance Attitude and Negative Attitude towards COVID-19 vaccine (r =0.355; p=0.019), Age (r =0.424; p=0.005) (**Table 4**).

Besides, significant negative linear correlations were revealed as follows: Conspiracy and Positive Attitude towards COVID-19 vaccine (r =-0.320; p=0.036), Negative Attitude towards COVID-19 vaccine (r =-0.305; p=0.046).

Table 4. Correlations Between Sub-dimensions of scales.

Scales and sub-dimensions		1	2	3	4	5	6	7	8	9	10	11	12	13
P	(1)Dangerousness	1												
	(2)Contagiousness	.647**	1											
PCa	(3) Conspiracy	-.290	-.236	1										
	(4) Environment	-.136	.082	-.014	1									
	(5) Faith	-.128	-.031	.561**	.133	1								
PCo	(6) Macro Control	-.068	-.066	.027	-.125	.244	1							
	(7) Personal Control	.009	-.186	.241	-.213	.375*	.42**	1						
	(8) Controllability	.363*	-.001	-.101	-.252	-.251	-.021	-.042	1					
AA	(9) Cognitive Avoidance	-.121	-.130	.140	-.077	-.077	-.071	.272	-.181	1				
	(10) Behavioral Avoidance	.462**	.418**	-.167	-.181	-.012	.204	.076	.415**	-.085	1			
ATV	(11) Positive Attitude	.404**	.360*	-.320*	-.068	-.088	.261	.098	.168	.004	.267	1		
	(12) Negative Attitude	.466**	.252	-.305*	.241	-.227	-.005	-.170	.292	-.147	.355*	.434**	1	
(13) Age (years)		.237	.152	-.059	-.067	.020	.496**	-.044	.002	-.067	.424**	.145	.161	1

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed). P: Disease Perception of COVID-19, PCo: Perception of Control of COVID-19, PCa: Perception of Causes of COVID-19, AA: Avoidance Attitudes from COVID-19, ATV: Attitudes Towards the COVID-19 Vaccine.

DISCUSSION

Our study revealed that the disease was perceived as dangerous and contagious among ophthalmologists. This result showed parallelism with the previous studies conducted on both COVID-19 patients (7) and healthcare workers (8). The fact that the disease is life-threatening, spreads rapidly in a very short time and causes a large number of casualties are the primary reasons that lead to this perception.

The results indicate the belief that the virus is a biological weapon or political game of developed countries to sell vaccines for "Conspiracy"; the pollution of clean water supplies, environment, and unhealthy lifestyle are the main causes of the pandemic for "Environment"; or the outbreak is a punishment of God for "Faith" was not strong. 'Conspiracy' sub-dimension can be explained by ophthalmologists' high levels of education, analytical thinking skills, and awareness of counter-arguments and refutations. Previous studies have concluded that the rise in education level and knowledge is inversely proportional to conspiracy beliefs (9,10). Some studies conducted in different parts of the world reported that continuous exposure to environmental pollution, particularly air pollution, was positively correlated with severity, transmission, and mortality in the COVID-19 outbreak (11,12). On the other hand, it is a fact that measures implemented such as lockdowns; restricted human activities; shutdowns of educational institutes, business centers, and other social interaction points; the decrease of industrial production and manufacturing; travel restrictions; and curfews also resulted in the reduction of environmental pollution and improved air and water quality across the world (13). Faith was also influenced by the COVID-19 pandemic in different ways. For example, in a study conducted among individuals belonging to Christianity in Poland, most participants stated that there was a strengthening of their faith with an increased risk of COVID-19, but there was no strengthening of their religious participation during the outbreak (14). Besides, research conducted on the Muslim generation in Indonesia has unearthed those participants adopted attitudes against the spread of the pandemic, the majority believed that the disease was generated by human error, and none agreed with the idea that the COVID-19 outbreak is a punishment from God (15). The current study, where all participants were Muslims, presented a similar result.

Our study suggested that the belief that control may be achieved by precautionary actions taken institutionally, publicly, and nationwide or cautious restraints may provide the control of COVID-19 was stronger in faculty members than residents. Moreover, behavioral avoidance attitudes from COVID-19 in females were higher than in males. This was also true of faculty and resident physicians. Males and resident physicians developed fewer avoidance attitudes from physical contact and collective public spaces. Our results bear a close resemblance to previous study results. Li et al. (16) and Yıldırım et al. (17) concluded that the perception of controllability increased in proportion to being female, having older age, a higher level of education or knowledge. More, Sobkow and colleagues observed that individuals with higher controllability exhibited increased intentions toward preventive behavior (18). Combating the COVID-19 pandemic has also led to the emergence of deprecating effects on the mental well-being of physicians. Providing adequate pre-job training and explaining accurate information on the ways of protection with clear guidelines may help relieve stress and increase occupational confidence (19).

Willingness to accept the COVID-19 vaccine was at a higher level in faculty than residents physicians. Besides, faculty showed fewer concerns than in resident physicians about the safety and effectiveness of the COVID-19 vaccine development process. This significant difference can be explained by the faculty's higher average age and protection behavior resulting from the higher level of knowledge regarding the safety and effectiveness of the COVID-19 vaccine. As a matter of fact, our results were in good agreement with earlier studies conducted in different geographies around the world (20-22).

Several statistically significant results were highlighted in the correlation analysis of our study. For example, high dangerousness perception was associated with high controllability and behavioral avoidance attitude along with highly positive approaches towards the COVID-19 vaccine. A similar relationship was observed between contagiousness perception and behavioral avoidance attitude together with a positive attitude toward the COVID-19 vaccine. The idea that the disease was dangerous and contagious strengthened the behavior of avoiding the disease and willingness to be vaccinated.

On the other hand, as the belief that the epidemic was our destiny or that the epidemic was God's wrath against social degradation increased, so did the perception of the effectiveness of personal measures taken to avoid contracting the disease. A similar positive linear correlation was also observed in the age parameter. As the age of participants increased, their belief in the effectiveness of preventive actions taken at the foundational, nationwide, or worldwide level also increased. A similar relationship was seen between age and behavioral avoidance attitude as well.

Besides, there was a negative correlation between attitudes towards the Covid-19 vaccine and conspiracy beliefs about the causes of the disease taking place in the press or social media such as biological warfare or efforts to sell vaccines.

All these correlations can be clarified by the theory of reasoned action and the theory of planned behavior. According to these theories, the actual behavior is preceded by the intention to perform a particular behavior. As intentions become stronger, it is assumed that the effort made to perform the behavior also increases, and as a result, the probability that the behavior will be performed increases (23). Further research should be carried out in the future to understand in depth the potential factors underlying the insights and attitudes expressed by ophthalmologists.

We are aware that our research may have several limitations. First, this was an online survey. The correctness of the data depended on the ability of participants to feel encouraged to give accurate and honest answers. The second limitation was that our survey consisted of closed-ended questions. The fact that the validity rate of surveys containing closed-ended questions is lower than other question types can be considered a restricting factor in our study. Another limitation was the relatively small sample size in the study.

CONCLUSION

Our work has led us to conclude that COVID-19 was perceived as dangerous and contagious among ophthalmologists. The perception of the control of COVID-19 in "Macro Control" and "Controllability" sub-dimensions were stronger in faculty than in resident physicians. Females and faculty developed higher behavioral avoidance attitudes from COVID-19. Faculty exhibited less negative attitude than residents physicians towards the COVID-19 vaccine in general and the sub-dimension of "Negative" respectively. These assessments could shed light on our path in combating the disease, both in the COVID-19 pandemic and in future outbreaks.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Ankara City Hospital Clinical Researches Ethics Committee (Date: 2021, Decision No: E1/1990/2021).

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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Author Contributions: All the authors declare that they have all participated in the design, execution, and analysis of the paper and that they have approved the final version.

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