An Assessment of Anxiety About the Viral Epidemic and Work-Related Stress in Family Physicians in Turkey: How does COVID-19 Vaccination Affect Anxiety and Stress?

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Abstract

Objective: The present study aimed to evaluate the extent of family physicians' anxiety about the viral epidemic and work-related stress associated with the viral epidemic as well as examining the effects of COVID-19 vaccination on such situations. Methods: The data collection forms, including SAVE-9 scale in order to assessand examine the extent of anxiety and stress, prepared for this cross-sectional study were converted into an online questionnaire form and sent to the physicians working as family physicians in different provinces of Turkey between December 2020 - March 2021 via e-mails and communication groups. The responses of 500 family physicians, who were accessible through this method and volunteered to participate in the study, were recorded to be analysed. Results: Of all the 500 family physicians in this study, 40.6% of them were found to be in a state of anxiety about the viral epidemic. While there was a significant decline in the scores of anxiety about the viral epidemic in the subgroup after vaccination, there was no statistically significant change in work-related stress scores. Conclusion: Family physicians have been suffering anxiety due to the pandemic. The vaccination has a positive impact on anxiety.

What is already known about this topic?

COVID-19 pandemic has raised anxiety for many people.

It is believed that COVID-19 vaccinations will help reduce the stress of millions of people around the world.

What does this article add?

- Family physicians have been suffering anxiety due to the pandemic.
- The vaccination has a positive impact on anxiety.
- The group that considered themselves as having inadequate income had statistically significantly higher scores of anxiety about the viral epidemic and of work-related stress associated with the viral epidemic.

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1. INTRODUCTION

The COVID-19 virus, which has been on the global agenda for more than a year, has produced massively devastating consequences. It is obvious that besides the physical and clinical symptoms caused by the COVID-19, there are also psychologically negative consequences of the disease. The COVID-19 pandemic has had some alarming impacts in terms of emotional and social functionality related to the mental health of individuals and society.[1] One of the groups most affected by such negative effects is undoubtedly healthcare workers.

Recent studies have shown that anxiety and despondency are considerably higher in healthcare workers, and that factors such as increased weekly working hours and increased number of patients with the COVID-19 are associated with the states of depression and anxiety.[2,3]

Other causes of increased anxiety and depression in healthcare workers may be directly related to the anxiety of being infected with the COVID-19, the uncertainty about the duration of the pandemic, and new places of work associated with the pandemic. In this context, the relevant authorities in Turkey have attempted to eliminate the negative consequences by means of certain methods such as additional financial supports or flexible working arrangements where possible. COVID-19 vaccinations, which have recently been intensified in our country and in the world, may also be one of the factors to exert a positive influence on healthcare workers against the states of anxiety and stress associated with the pandemic.

Since the COVID-19 virus is an important public health issue not only in our country but also all over the world, it has been aimed to protect health and prevent the spread of the virus through measures taken for the sake of the people and the environment when it comes to the management of the COVID-19 pandemic. In this context, protective and preventive health care services have gained considerable importance. Family physicians, who are the backbone of preventive health care services, have undertaken great responsibilities in various fields in the management of the process since the beginning of the pandemic. Triage, treatment, monitoring, efficient use of resources and providing cost-effective care are among these areas of responsibility.[4] Family physicians are also considered as the building blocks of surveillance efforts because they are intertwined with families and individuals in social life.[5]

The contact tracing procedures in Turkey, which have been strictly applied under the leadership of family physicians, not only help detect source patients and their contacts, but also ensure that infected cases are isolated and people with close contacts are quarantined. In the management of the process, family physicians in hospitals work in the departments such as pandemic triage and pandemic service, whereas those in family health care centres monitor the infected patients from among those registered to them through close follow-up. In addition, with the latest developments, family physicians have been given more active duties and responsibilities in the vaccination process for the purpose of controlling the pandemic.

The efforts and sacrifices of family physicians, who deliver protective and preventive health care services to the public and are in close contact with individuals in the society, have been of undeniable importance,

especially during the management of the pandemic. However, considering the weariness and length of the process, it is reckoned that family physicians, like all health workers, have increased anxiety, stress, and depression. The current study, therefore, has aimed to evaluate the extent of anxiety and work-related stress associated with the COVID-19 pandemic in family physicians who play an active and efficient role in the management of the pandemic in addition to examining the effect of COVID-19 vaccination on such circumstances.

2. METHODS

2.1. Study Groups

The population of this cross-sectional survey study consisted of healthcare professionals working as family physicians in Turkey.

The data collection period started on 22 December 2020 with a group of 50 people, the majority of whom were physicians working in the Family Medicine Clinic in XXX XXX Hospital. First of all, data collection forms were sent to physicians as online questionnaires via e-mail (GoogleGroups) and communication groups (Facebook, WhatsApp). After being asked sociodemographic and descriptive questions, the physicians were administered the SAVE-9 scale consisting of 9 questions and 2 sub-dimensions, which was developed in Korea by Chung et al. in order to evaluate the extent of stress and anxiety in healthcare professionals, and then translated into Turkish by Akça and Bilgiç.[6,7] The data collection forms containing the scale were delivered to other family physicians in the form of an online questionnaire via e-mail and communication groups by snowball sampling. After subtracting the answers of 3 participants who declined to participate in the study, 24 participants whose questionnaires were received back more than once, and 3 participants who gave inappropriate answers (such as having more years of professional experience than their age), the answers of the remaining 500 family physicians from 53 different provinces were recorded and the first phase ended on 11 January 2021.

On 14 January 2021, the period of mass vaccination started first with healthcare workers in Turkey. In the present study, the scale was administered once again in March 2021 to 50 family medicine physicians identified at the beginning of the study, considering that they had already received two-dose vaccination, and their answers were recorded.

After obtaining permission prior to the study to use the translated Turkish version of the scale,

the necessary approval was obtained from the Clinical Research Ethics Committee of XXX XXX with the approval number 20/14 dated 22.12.2020. The study was conducted in accordance with the Declaration of Helsinki.

2.2. Measurement Tools

Sociodemographic Data Form: The present study includes a data form prepared by the researchers in such a way as to contain age, gender, marital status, and other sociodemographic and clinical characteristics associated with the COVID-19 pandemic.

SAVE-9 (the Stress and Anxiety to Viral Epidemics) Scale: Developed by Chung et al. in Korea to measure anxiety and stress of healthcare workers, the scale consists of 9 questions and 2 sub-dimensions. Six questions in the scale aim to assess anxiety about the viral epidemic, while 3 questions measure the work-related stress associated with the viral epidemic. The responses given to the questions in the scale were stated as: "never, rarely, sometimes, often, always", and scoring was done as 0, 1, 2, 3, 4, respectively. A total value of [?] 22 for 9 questions and/or a score of [?] 15 for 6 questions measuring the anxiety about the viral epidemic were considered significant.[6]

2.3. Statistical Assessment

The descriptive findings were presented with mean+-standard deviation (SD) or median (min-max) for the continuous data, and with frequency (n) and percentage (%) for the categorical data. The normality

assumptions were controlled by the Shapiro-Wilk test. Categorical data were analyzed by Pearson's chi-squared and Fisher's Exact test. Student's t-test was used for analysis of normally distributed numerical data. One-Way ANOVA was used for comparison of parametric variables between groups and Tukey HSD test was used as a post-hoc test for significant cases. The McNemar test was used to compare paired categorical data. The paired samples test t-test was used for comparison of repeated measurements. The Spearman and Pearson correlation tests were used to examine the relationship between the SAVE-9 score and the other numerical variables. Multiple linear regression analysis was performed to determine the associated factors with the stress and anxiety of participants. The variables with $p < 0.2$ in the univariate analyses were further tested in the multivariate model. Cronbach's alpha coefficient was calculated for the reliability analysis. Statistical analysis was made using IBM SPSS Statistics for Windows, Version 23.0 (IBM Corp., Armonk, NY). Two-sided p-value less than 0.05 was considered statistically significant.

3. RESULTS

Of all the 500 family medicine physicians in the present study, 56.4% of them were female while 43.6% were male, with the mean age of 37. +- 9.6 (25-63) years. The majority of the participants (55.7%) were reported to be working in a family health centre (FHC). Table 1 presents the sociodemographic characteristics of the participants.

Of all the participants, 91.8% (n=459) of them were reported to be working in the COVID-19 related units (Table 2).

In the study, the anxiety status of 500 family physicians before the vaccination was assessed and 40.6% (n=203) were found to experience anxiety about the viral epidemic with a score of [?]15.

When the SAVE-9 scale and sub-scale scores of the participants were examined, the scores of anxiety about the viral epidemic ($p < 0.001$) and of work-related stress associated with the viral epidemic ($p = 0.020$) were found to be significantly higher in female physicians. No significant relationship was found between the variables of age, marital status, smoking, having a child, and anxiety and stress scores, whereas the group that considered themselves as having inadequate income had statistically significantly higher scores of anxiety about the viral epidemic and of work-related stress associated with the viral epidemic ($p < 0.001$) (Table 3).

A negative correlation was found between the level of income and the SAVE-9 scale and subscale scores, according to which anxiety and stress scores were found to increase as the level of income decreased (Table 4).

When the participants were evaluated according to their COVID-19-related workplaces, it appeared that the scores of anxiety about the viral epidemic ($p = 0.027$) along with the total scores of anxiety and stress ($p = 0.033$) in physicians actively working in COVID-19 units were found to be statistically significantly higher than those scores of the participants who never worked or who previously worked, but not currently working in such units. Work-related stress scores were found to be significantly higher in the group who had been infected and recovered from the COVID-19 infection ($p = 0.017$) (Table 5).

In the present study, when the family physicians were evaluated in terms of their duties in the units related to the COVID-19, the concern of infecting the family members of the group who worked actively in the units related to COVID-19 was found to be significantly higher ($p = 0.009$) in comparison to the group who previously worked in the units related to COVID-19, but are not currently working and the groups who have never worked in the units related to the COVID-19.

The examination of whether or not the family physicians in the group of 50 participants in the present study had received two doses of COVID-19 vaccine revealed that 92% (n=46) were already vaccinated.

After the COVID-19 vaccination, this subgroup of 50 participants were re-administered the scale for the purpose of comparing the responses with those received at the beginning. After the re-administration, a significant decline was observed in the family physicians' scores of anxiety about the viral epidemic after

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vaccination (p=0.001), while no significant change was found in work-related stress scores (p=0.078) (Table 6).

The multiple linear regression analysis of the factors affecting the total scores in the SAVE-9 scale has shown that the variables of being female (β=0.240; p<0.001), working in the FHC (β=0.123; p=0.010), being married (β=0.095; p=0.029), smoking (β=0.086; p=0.042), presence of chronic disease (β=0.103; p=0.016), currently working in the COVID-19 related units (β=0.092; p=0.034), and having been infected and recovered from the COVID-19 were positively correlated with the total scores of the SAVE-9 scale, and that the stress scores were higher in those participants. We also found that the participants' SAVE-9 scale scores decreased with an increasing income level (β=-0.282; p<0.001) (Table 7).

4. DISCUSSION

This study assessed the extent of anxiety about the viral epidemic and relevant work-related stress of 500 healthcare professionals working as family physicians in Turkey, and determined that a significant number of the participants (40.6%) were suffering anxiety about the viral epidemic. When the subgroup of 50 participants was assessed for the second time after the COVID-19 vaccination, it appeared that there was a significant decline in physicians' anxiety about the viral epidemic, but with no significant change in their scores of work-related stress associated with the viral epidemic. The increasing responsibilities of family physicians in the management of the pandemic may be regarded as the main reason for this.

On the other hand, there are many studies examining the psychological effects of the pandemic. In the early days of the pandemic in China, 927 medical health workers, i.e., nurses and doctors, and 1255 non-medical health workers were evaluated in terms of their mental status and relevant symptoms in a study concluding that insomnia, anxiety, depression and obsessive-compulsive disorders presented by the group of medical health workers proved significantly more common than those presented by nonmedical health workers.[8]

Another study conducted by Huang et al. with healthcare professionals who were involved in the treatment of COVID-19 at the beginning of the pandemic reported that clinical anxiety symptoms increased in 23% of the participants without a statistically significant difference in terms of age, marital status, department, title, educational background, and professional status.[9] In our study, in a similar manner, no statistical significance was observed between the variables of age, marital status, having a child, and the scores of anxiety about the viral epidemic and of work-related stress associated with the viral epidemic, whereas work-related stress scores appeared to be significantly higher in family physicians with chronic diseases.

Moreover, a study conducted in Spain with 1228 healthcare professionals who had contact with patients with the COVID-19 reported that the rate of having a possible anxiety disorder was 58.6%, while the rate of having a serious anxiety disorder was 20.7%.[10] It was unfortunately not possible to rate the anxiety levels with the scale used in our study.

In a study conducted with the nurses in Korea using the SAVE-9 scale, the participants were divided into two groups as depressed and non-depressed, as a result of which the SAVE-9 scale scores turned out to be significantly higher in the group with depression, both in the subgroup of anxiety assessment and subgroup of the work-related stress assessment.[11] In our study conducted with family physicians in Turkey by using the SAVE-9 scale, we determined that a significant part of the participants (40.6%) were in a state of anxiety about the viral epidemic.

The assessment of work-related stress scores in our study showed that the stress scores were significantly higher in the physicians who followed up patients infected with COVID-19 in the FHC. In addition to the cross-sectional assessment of anxiety about the viral epidemic and work-related stress associated with the viral epidemic, our study also examined the effect of COVID-19 vaccinations on these conditions in the subgroup, which is the strength of our study. Moreover, in the literature, no study was found to have explored the changes in mental status after COVID-19 vaccinations, which is another strength of our study.

The scientific world has been racing against time since the beginning of the pandemic, bringing along some drawbacks by nature. The scale we used in our study has already been translated into different multiple

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languages, including Turkish. [7,12,13] However, a validity and reliability study for Turkish has not been published yet, which is one of the limitations of our study.

In a study evaluating anxiety and depression associated with the COVID-19 pandemic in Iran, the prevalence of anxiety symptoms in the group infected with COVID-19 was found to be higher than in the non-infected group.[14] In our study, while work-related stress scores were found to be significantly higher in the group infected with the COVID-19 virus compared to the non-infected group, no statistical significance was found in the scores of the anxiety about the viral epidemic.

A study of 393 participants with resident physicians and those continuing their minor studies reported that 55% of the participants had been working in COVID-19-related units, and that the stress and burnout scores were significantly higher in physicians working in such units than those who were not.[15] Similarly, in our study, pandemic-related stress scores were found to be statistically significantly higher in the group of participants who were actively working in relation to the COVID-19. In addition, the formerly mentioned study concluded that the state of being stressed was higher in female participants. Likewise, in our study, the scores of anxiety about the viral epidemic and work-related stress were found to be significantly higher in female physicians than in male physicians.

When it came to the COVID-19-related departments where the participants were working, the pandemic-related stress scores appeared to be the highest among the physicians working in the COVID-19 ICUs, which may be related to the fact that they are one of the work spaces that most clearly demonstrates the life-threatening risk of the pandemic to human life.

A study conducted with 197 physicians and nurses working in units related to the COVID-19 reported that 33% of the participants presented symptoms of anxiety ranging from severe to very severe, while 27.9% of them presented symptoms of stress ranging from severe to very severe, and that the nurses' scores of anxiety and stress were reported to be significantly higher than those of the physicians in the study.[16] Likewise, in another study conducted with healthcare workers by Karadem et al., it was reported that being a nurse may be associated with the fear of COVID-19.[17]

In our study, the evaluation according to the title revealed that the scores of anxiety about the viral epidemic in family medicine academics were found to be significantly lower than those of the other groups. The group with the highest work-related stress scores turned out to be the non-tenured family physicians.

A study assessing the extent of the COVID-19 induced anxiety and stress of 1106 physicians in Israel drew attention to the fact that the fear of being infected and the worry of transmitting an infection to family members were among the factors most strongly associated with the state of anxiety. Financial concerns, on the other hand, were found to be unrelated to anxiety.[18]

In our study, when the pandemic-related stress scores were assessed, the question with the highest score was about the concern that family or friends might be infected from the participant. However, there was a negative correlation between the income levels and the stress scores, such that the scores of anxiety about the viral epidemic and of work-related stress found to be significantly high, even at the highest levels, in the group considering their income levels as inadequate. The regression analysis of the results in our study showed that the total score decreased with the increasing income level, a situation that supports the fact that financial concerns are effective in the presence of stress in our country.

Although circumstances such as working in the COVID-19-related units or inadequate income have increasing effects on stress, it is believed that COVID-19 vaccinations will help reduce the stress of millions of people around the world.[19] In our study, the evaluation of the subgroup after the COVID-19 vaccination clearly indicated a significant decline in the participants' reconsidering their profession, which had emerged as a result of the fear of deterioration in their health due to the virus, and the concern of getting infected as well as infecting the relatives.

Family physicians, who take on important duties and responsibilities in the management of the pandemic, clearly experience anxiety about the viral epidemic. Although vaccinations have started to relieve anxiety

in family physicians to a certain extent, the lack of a significant reduction in work-related stress even after vaccination may be related to the length of the pandemic, increased work areas, and the continuation of the intense workload. Sharing the increasing responsibilities of family physicians with their colleagues specialized in other departments may contribute to reducing work-related stress.

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TABLES

Table 1. General characteristics of the participants (n=500)

Variables	
Age, X±SS/ min-max	
25-34	
35-44	
45-54	
55-64	
Gender	
Female	
Male	
Title	
Specialist Doctor	
Family Medicine Assistant	
Non-tenured Family Physician with Ongoing Training for Specialty	
Academic	
Non-tenured Family Physician	
Place of Work	
FHC	
Hospital	
Other	
Years of Profession, X±SS / min-max	
Marital Status	
Single	
Married	
Children	
No	
Yes Smoking Non-smoker Smoker Quitter Psychiatric Disorder No Yes Chronic Disease No Yes Income Level Inadequate M	

FHC: Family health centre

Table 2. Participant characteristics related to the COVID-19 (n=500)

Variables	n	%
Work Related to the COVID-19		
Previously worked, currently not working	50	10.0
Currently working	409	81.8
Never worked	41	8.2
Place of Work		
The FHC for the follow-up of patients infected with the COVID-19	285	57.0
Contact Tracing Team	90	18.0

Variables	n	%
Specimen Collection	132	26.4
COVID-19 triage	124	24.8
COVID-19 service	112	22.4
COVID-19 ICU	29	5.8
COVID-19 polyclinic	10	2.0
Whether or not infected with the COVID-19		
No	431	86.2
Yes	69	13.8
Hospital admission due to the COVID-19 (n=69)		
No	61	88.4
Yes	8	11.6

FHC: Family health centre, ICU: Intensive care unit

Table 3. SAVE-9 scale and sub-scale scores according to the general characteristics of the participants

		Anxiety about the viral epidemic	Anxie
Variables	**n**	**X±SS**	**P**
Age			
25-34	256	13.3±4	0.864
35-44	116	13.5±4.6	
45-54	104	13.2±4	
55-64	24	13.8±4	
Gender			
Female	282	14±3.9	**<0.00**
Male	218	12.5±4.3	
Title			
Specialist Doctor	118	13.1±4.2	**0.024**
Family Medicine Assistant	154	13.7±4.1	
Non-tenured Family Physician with Ongoing Training for Specialty	54	13.6±4	
Academic	20	10.6±4.5	
Non-tenured Family Physician	154	13.5±4.2	
Statistical significance		1-4, 2-4, 3-4, 4-5	
Place of Work			
FHC	273	13.5±4.1	0.418
Hospital	212	13.2±4.3	
Other	15	12.3±3.3	
Statistical Significance		-	
Marital Status			
Single	135	12.8±4.2	0.082
Married	365	13.6±4.2	
Children			
No	234	13.3±4.2	0.713
Yes	266	13.4±4.1	
Smoking			
Non-smoker	339	13.1±4.3	0.096
Smoker	93	14.2±4.1	
Quitter	68	13.4±3.7	
Psychiatric Disorder			

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		Anxiety about the viral epidemic	Anxie
No	464	13.4±4.2	0.931
Yes	36	13.3±4.5	
Chronic Disease			
No	365	13.2±4.2	0.149
Yes	135	13,8±4,2	
Income Level			
Low	62	15.1±4.4	**<0.00**
Moderate	291	13.6±3.9	
Good- Very good	147	12.1±4.2	
Statistical significance		1-2, 1-3, 2-3	

Student's t-test, One-way ANOVA test. FHC: Family health centre

Table 4. The correlation between the participants' SAVE-9 scale and subscale scores, and other variables

	Anxiety about the viral epidemic	Anxiety about the viral epidemic	Work-related stre
Variables	**R**	**P**	**R**
Age	0.002	0.966	0.037
Years of Profession	0.005	0.920	0.043
Income Level	-0.198	**<0.001**	-0.221

Table 5. SAVE-9 scale and subscale scores according to the COVID-related characteristics of the participants

		Anxiety about the viral epidemic	Anxie
Variable	**n**	**X±SS**	**P**
Work Related to the COVID-19			
Previously worked, currently not working	50	12.4±3.6	**0.027**
Currently working	409	13.6±4.2	
Never worked	41	12.2±4.3	
Statistical significance		1-2, 2-3	
The FHC for the follow-up of patients infected with the COVID-19			
No	215	12.9±4.3	**0.033**
Yes	285	13.7±4	
Contact Tracing Team			
No	410	13.4±4.1	0.743
Yes	90	13.2±4.4	
Specimen Collection			
No	368	13.3±4.1	0.391
Yes	132	13.6±4.5	
COVID-19 triage			
No	376	13.3±4.1	0.605
Yes	124	13.5±4.5	
COVID-19 service			
No	388	13.3±4.1	0.696
Yes	112	13.5±4.6	
COVID-19 ICU			
No	471	13.3±4.2	0.070

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		Anxiety about the viral epidemic	Anxie
Yes	29	14.7±4.2	
COVID-19 polyclinics			
No	490	13.4±4.2	0.373
Yes	10	12.2±2.8	
Whether or not infected with the COVID-19			
No	431	13.3±4.2	0.370
Yes	69	13.8±4.3	
Hospital admission due to the COVID-19 (n=69)			
No	61	13.8±4.5	0.913
Yes	8	13.6±2.5	

Student's t-test, One-way ANOVA test. FHC: Family health centre, ICU: Intensive care unit

Table 6 . The comparison of pre- and post-vaccine SAVE-9 scale and subscale scores in the subgroup to whom the scale was readministered (n=50)

Variables
Stress and Anxiety to Viral Epidemic-9 (SAVE-9)
Anxiety about the viral epidemic
Are you afraid that the virus outbreak will continue indefinitely?
Are you afraid your health will worsen because of the virus?
Are you worried that you might get infected?
Are you more sensitive towards minor physical symptoms than usual?
Do you worry your family or friends may become infected because of you?
Are you worried that others might avoid you even after the infection risk has been minimized?
Work-related stress associated with the viral epidemic
Do you feel sceptical about your job after going through this experience?
After this experience, do you think you will avoid treating patients with viral illnesses?
Do you think that your colleagues would have more work to do due to your absence from a possible quarantine and might b

Paired Samples t-test.

Table 7. The factors affecting the participants' total score in the SAVE-9 scale

	SAVE-9	SAVE-9	SAVE-9	SAVE-9	SAVE-9	SAVE-9	95% (
Model	**B**	**SE**	**B**	**t**	**Sig.**	**VIF**	**Lowe**
Being female	2.973	0.537	0.240	5.533	**<0.001**	1.112	1.917
Working in the FHC	1.512	0.588	0.123	2.573	**0.010**	1.341	0.357
Being married	1.320	0.601	0.095	2.195	**0.029**	1.115	0.138
Smoking	1.362	0.668	0.086	2.039	**0.042**	1.058	0.050
Chronic disease	1.419	0.585	0.103	2.426	**0.016**	1.055	0.270
Income level	-2.681	0.403	-0.282	-6.650	**<0.001**	1.058	-3.473
Currently working related to the COVID-19	1.466	0.692	0.092	2.120	**0.034**	1.115	0.108
Recovered from the COVID-19	1.544	0.749	0.087	2.061	**0.040**	1.045	0.072

R=0.409, R^2=0.168, p<0.001 FHC: Family health centre