ORIGINAL ARTICLE

Psychiatry and Clinical Psychopharmacology 2021;31(1):83-89
DOI:10.5152/pcp.2021.20165

Effect of Infection on Mental Health in COVID-19 Positive Cases and its Relationship with Clinical Variables

Gulden Eser Karlidag[1], Abdulkadir Kantarcioglu[2], Zulal Asci Toraman[3], Hale Nur Balci[4], Esengul Gulmez[4], Murad Atmaca[4]

[1]Clinic of Infectious Diseases and Clinical Microbiology, University of Health Sciences, FethiSekin City Hospital, Elazığ, Turkey; [2]T.C. Ministry of Health Elazig Provincial Health Directorate, Turkey; [3]Department of Microbiology, Fırat University School of Medicine, Elazığ, Turkey; [4]Department of Psychiatry, Fırat University School of Medicine, Elazığ, Turkey

ABSTRACT

Background: While global attention has focused largely on the effects of the coronavirus on physical health, the effects of the coronavirus on mental health cannot be ignored. Therefore, this study aims to investigate the effects of COVID-19 disease on mental health and its relationship with other clinical variables.

Methods: In this study, adult patients over 18 years of age who were diagnosed with COVID 19 by real time-polymerized chain reaction (RT-PCR) method in our city were included. By using some psychological scales, psychological influence was determined in the study subjects.

Results: DASS-21 anxiety and total scores were higher in female patients than males. COVID-19 Fear Scale, DASS-21 anxiety, depression, and total scores were higher in married patients than single ones. Patients living in rural areas had higher Fear of COVID-19 scale, DASS-21, depression, and total scores and lower Life Satisfaction Scale scores compared to those living in city centers. Patients with any chronic illness and psychiatric disorder had higher COVID-19 Fear Scale, DASS-21 anxiety, and total scores. The presence of respiratory symptoms and positive CT pneumonia were closely associated with higher scale scores.

Conclusions: We suggest that the COVID-19 outbreak seems to also affect patients psychologically. This influence is more in COVID-19 positive patients who were females, married, those living in rural areas, ones with chronic medical or psychiatric disorder, and ones with respiratory symptoms and positive CT findings. Future studies with face-to-face interviews are required to prove this observation further.

ARTICLE HISTORY

Received: 28 November, 2020
Accepted: 06 December, 2020

KEYWORDS: COVID-19, DASS-21, mental health, psychological impact

INTRODUCTION

Novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection was named Coronavirus Disease 2019 (COVID-19) and declared as a pandemic by the World Health Organization (WHO) on 11 March 2020.[1]

COVID-19 symptoms include fever, chills, cough, sore throat, myalgia, nausea, vomiting, and diarrhea. The COVID-19 clinical spectrum may range from asymptomatic or mild respiratory infection to acute respiratory distress syndrome (ARDS), fulminant pneumonia, or fatal multiple organ failure.[2]

A limited number of studies in the literature have investigated the effects of COVID-19 on mental health. Examining the effects of illness perceptions of individuals diagnosed with COVID-19 on mental health may pave the way for addressing both public health and individual health from a physical and mental perspective in an integrated manner.[2-4]

One of the most stressful situations during such pandemics is the unpredictability of the process, the uncertainty as to when the disease will be contained, and the severity of the risk. This situation, coupled with some analyses and false information, may increase collective anxiety.[5] Difficulties, stress, and uncertainty can trigger common mental disorders such as anxiety and depression.[6]

During pandemics, serious concerns can arise among patients such as fear of death. People placed under isolation and quarantine can develop feelings of loneliness and anger.[3] Moreover, the isolation process restricts face-to-face connections and conventional social lives of people, and it can increase the stress felt by the individual.[4] In the face of such crises, psychological response should be considered from a public health perspective in the context of emergency and as part of the health care system.[7]

Corresponding author: Gulden EserKarlidag, E-mail: guldeneser@gmail.com

Cite this article as: Karlidag GE, Kantarcioglu A, Toraman ZA *et al*. Effect of infection on mental health in covid-19 positive cases and its relationship with clinical variables. *Psychiatr Clin Psychopharmacol*. 2021; 31: 83-89.

While global interest largely focuses on the physical health effects of COVID-19, its impact on mental health cannot be ignored. Therefore, this study aims to investigate the effects of COVID-19 on mental health and its relationship with other clinical variables. We believe the results of our study may guide the approach to future pandemics to holistically address both the mental and physical health of patients.

METHODS

Patients

Adult patients over 18 years of age diagnosed with COVID-19 by the real-time polymerized chain reaction (RT-PCR) method were included in this study. This study was conducted in partnership with Elazig Fethi Sekin City Hospital, Infectious Diseases Clinic and Fırat Universty, Faculty of Medicine Department of Psychiatry.

This study included 123 patients from March 18, 2020, when the first case was detected in our province, through June 30, 2020. The study was approved by the General Directorate of Health Services of the Ministry of Health, Scientific Studies Board (Approval No: 2020-05-14T21_37_36) and by the University Non-Invasive Research Ethics Board (No: 2020/08-14).

Patients with 7-14 days of stay in our hospital followed by 14 days of isolation were included in the study. Patients admitted to intensive care were excluded. Patients were treated in accordance with the recommendations of the Ministry of Health General Directorate of Public Health COVID-19 Adult Patient Treatment Manual.[8]

At the time of admission to the hospital, patients were questioned regarding their age, sex, marital status, education status, place of residence, occupation, smoking, history of chronic disease, history of psychiatric disease, history of psychiatric disease in their first-degree relatives, and clinical symptoms (fever, cough, respiratory distress, muscular-joint pain, headache, sore throat, olfactory and taste disorders, abdominal pain, and diarrhea). Patients' radiological pulmonary findings were obtained through the radiological examination button in the hospital automation system. Patients with confirmed pulmonary diagnoses were recorded under "radiologically detected pneumonia." Patients were told that they would be asked questions as to how their mental health was affected, data would be used for individual and public health purposes, and their personal data would not be used; then, their consent was obtained. This study was designed in accordance with ethical principles in medical research on human volunteers set forth in the Helsinki Declaration of the World Medical Association.

Scales Used in Evaluation

In our study, the Turkish version of fear of COVID-19 scale, the Depression, Anxiety and Stress Scale (DASS-21), and the Satisfaction With Life Scale (SWLS) were administered to the patients. Patients were interviewed face-to-face or by phone and evaluated by the same physician.

Fear of COVID-19 Scale: Ahorsu et al.[9] developed a valid and reliable scale to assess COVID-19 fear. In Turkey, the fear of COVID-19 scale was adapted to Turkish by Satıcı et al.[10]; the Turkish version of the scale was shown to have strong psychometric features.

DASS-21: *DASS-21* was developed by Lovibond[11] to assess anxiety, depression, and stress. DASS-21 was built upon the original DASS by Henry and Crawford[12]and Mahmoud et al.[13] DASS-21 includes three sub-scales that assess depression, anxiety, and stress. DASS-21 was adapted into Turkish by Yılmaz et al.[14]

SWLS: *SWLS* was developed by Diener et al.[15] and is a one-dimensional 5-point scale. High scores indicate a higher level of satisfaction with life. The SWLS was adapted into Turkish by Durak et al.[16]

Statistical Analysis

Statistical analysis of the data was conducted in the Statistical Package for the Social Sciences (SPSS) version 22.0 (IBM SPSS Corp.; Armonk, NY, USA). Shapiro–Wilk test was used to investigate whether the data had normal distribution. Descriptive statistics of data were indicated as mean ± standard deviation for variables with normal distribution in continuous data, as [median (minimum-maximum)] for non-normal variables, and the frequency for categorical variables was specified as a percentage [*n* (%)]. One-way ANOVA was used to compare more than two independent samples for continuous data with normal distribution followed by LSD test as post-hoc testing; Kruskal–Wallis test was used to compare more than two independent samples for non-normal continuous data followed by the Dunn test as post-hoc testing. Mann-Whitney U test was used to compare two independent samples. Pearson's chi-square test was used to analyze categorical data. The level of significance was set at $P < .05$.

RESULTS

A total of 123 people were included in the study: 70 (56.9%) women and 53 (41.1%) men. All patients had received inpatient treatment and completed a 14-day isolation period. Patients were aged between 19 and 74 years (mean 43.88 ± 14.73 years). Demographic characteristics of patients are summarized in Table 1.

The DASS-21 anxiety and the DASS-21 total score were statistically significantly higher in female patients compared to male patients ($P = .008$ and .049, respectively). The fear of COVID-19 scale, DASS-21 anxiety, DASS-21 depression, DASS-21 stress, and DASS-21 total scores were statistically higher in single patients compared to married patients (P = .001, .014, .002, .021, and .002, respectively). A

Table 1. Descriptive Information of the Participants

		Frequency	%
Sex	Female	70	56.9
	Male	53	43.1
Marital status	Single	37	30.1
	Married	86	69.9
Education status	First	31	25.2
	Secondary	16	13.0
	High	31	25.2
	University	36	29.3
	Illıterate	9	7.3
Place of residence	Village	6	4.9
	Town	18	14.6
	City	99	80.5
Economic conditions	Low	21	17.1
	Middle	95	77.2
	High	7	5.7
Occupation	Housewives	38	30.9
	Public Employee	39	31.7
	Worker	19	15.4
	Retired	15	12.2
	Unemployed	12	9.8
Smoking	Yes	14	11.4
	No	109	88.6
History of chronic disease	Yes	37	30.1
	No	86	69.9
History of psychiatric disease	Yes	20	16.3
	No	103	83.7
HPD-F	Yes	11	8.9
	No	112	91.1
Symptom	Yes	91	74
	No	32	26
Cough	Yes	39	31.7
	No	84	68.3
Respiratory distress	Yes	36	29.3
	No	87	70.7
Muscular-joint pain	Yes	33	26.8
	No	90	73.2
Fever	Yes	27	22.0
	No	96	78.0
Headache	Yes	24	19.5
	No	99	80.5
Sore throat	Yes	15	12.2
	No	108	87.8
Olfactory and taste disorders	Yes	15	12.2
	No	108	87.8
Abdominal pain-diarrhea	Yes	5	4.1
	No	118	95.9
Torax CT findings	Yes	72	58.5
	No	51	41.5

HPD-F: History of Psychiatric Disease in the Family.

statistically significant difference was present among patients with fear of COVID-19 scale, DASS-21 depression, DASS-21 total, and SWLS scores depending on their place of residence (P=.044, .036, .040, and .046, respectively). Town dwellers were found to have higher fear of COVID-19 scale, DASS-21 depression, and DASS-21 total score, and they had a lower SWLS score than city dwellers. A statistically significant difference existed in patients' DASS-21 anxiety and SWLS scores depending on their economic conditions (P=.017 and .025, respectively). Compared to high income earners, low income earners had significantly higher DASS-21 anxiety scores and significantly lower SWLS. Based on occupation, housewives, and the unemployed had statistically significantly higher DASS-21 anxiety scores compared to public employees (P=.009 and .014, respectively). Smokers had statistically significantly higher DASS-21 stress scale scores compared to non-smokers (P=.003) (Table 2).

Patients with chronic diseases had statistically significantly higher fear of COVID-19 scale, DASS 21 anxiety, and DASS 21 total scores compared to those without chronic diseases (P=.021, .002, and .006, respectively). Patients with a history of psychiatric disease had statistically significantly higher fear of COVID-19 scale, DASS-21 depression, DASS-21 stress, and DASS-21 total scores than those without psychiatric diseases (P = .008, .002, .020, and .001, respectively). No significant difference was present between scale scores when patients were evaluated according to their education status and the presence of psychiatric diseases in the family ($P \geq .05$) (Table 2).

Furthermore, 91 patients had one or more COVID-19 related clinical symptoms and 32 patients were asymptomatic. Symptomatic patients had significantly higher fear of COVID-19 scale, DASS-21 anxiety, DASS-21 depression, and DASS-21 total scores (P=.033, .000, .026, and .001, respectively) (Table 2).

When the symptoms were evaluated separately, patients with coughing symptoms had significantly higher fear of COVID-19 scale, DASS-21 anxiety, and DASS-21 total scores (P=.037, .028, and .005, respectively). Those with respiratory distress had significantly higher fear of COVID-19 scale, DASS-21 anxiety, DASS-21 stress, and DASS-21 total scores (P=.006, .000, .001, and .000, respectively). The DASS-21 anxiety score was significantly higher in patients with muscle and joint pain (P=.016). Patients with sore throat had a significantly higher fear of COVID-19 scale and the DASS-21 stress scale scores (P=.027 and .044, respectively); those with olfactory and taste disorders had significantly higher DASS-21 anxiety, DASS-21 depression, and DASS-21 total scores (P = .019, .002, and .031, respectively). Patients with abdominal pain and diarrhea had significantly higher total DASS-21 score (P=.019). No significant difference was present in scale scores between patients with fever and headache compared to those without these symptoms (Table 2).

Table 2. The Comparisons of Fear of COVID-19 Scale, DASS-21 Anxiety, DASS 21 Depression, DASS 21 Stress, DASS 21 Total, and SWLS Scores of the Patients

	Fear of COVID-19 Scale	DASS-21 Anxiety	DASS 21 Depression	DASS 21 Stress	DASS 21 Total	SWLS
Cinsiyet/*P* value		**0.008**			**0.049**	
Male	11 (2-33)	3 (0-19)	3 (1-15)	6 (1-20)	17 (3-43)	29 (5-35)
Female	17.5 (7-35)	7 (1-20)	6 (0-20)	6 (1-21)	19 (3-53)	25 (5-35)
Marital status/*P* value	**.001**	**.014**	**.002**	**.021**	**.002**	
Single	19 (7-31)	7 (1-19)	7 (1-20)	9 (1-19)	22 (3-48)	24 (8-35)
Married	11 (2-35)	4 (0-20)	3 (0-21)	4 (1-21)	16.5 (3-53)	29 (5-35)
Education/*P* value						
First	13 (7-31)	7 (1-20)	3 (0-20)	6 (1-21)	23 (3-53)	30 (5-33)
Secondary	16 (7-29)	2.5 (0-19)	3.5 (1-11)	5 (1-17)	11.5 (3-34)	28.5 (9-32)
High	11 (2-33)	5 (1-17)	3 (1-16)	5 (1-20)	20 (3-35)	29 (8-35)
University	19 (7-31)	5 (1-19)	5 (1-20)	8 (1-19)	18 (4-48)	26 (13-35)
Illiterate	10 (7-35)	3 (1-13)	1 (1-14)	2 (1-13)	7 (3-34)	21 (5-33)
Place of residence/*P* value	**.044**		**.036**		**.040**	**.046**
Village	19 (7-29)	7 (1-13)	1 (1-11)	9.5 (1-16)	22 (3-34)	20.5 (5-33)
Town	21 (7-35)	7 (1-19)	8 (1-20)	8 (1-21)	22 (3-43)	19 (5-33)
City	13 (2-33)	4 (0-20)	4 (0-21)	6 (1-20)	17 (3-53)	28 (8-35)
Economic conditions/*P* value		**.017**				**.025**
Low	14 (7-31)	7 (1-19)	3 (1-15)	3 (1-19)	17 (-45)	21 (9-31)
Middle	17 (2-35)	4 (0-20)	4 (0-20)	6 (1-21)	18 (3-53)	28 (5-35)
High	13 (9-20)	4 (1-8)	6 (1-16)	12 (1-15)	18 (4-28)	30 (19-32)
Occupation/*P* value		**.022**				
Housewives	11 (7-35)	7 (1-20)	2.5 (0-20)	3 (1-21)	19 (3-53)	30 (5-33)
Public employee	18 (2-31)	4 (0-19)	4 (1-14)	6 (1-19)	18 (3-35)	28.5 (9-32)
Worker	13 (7-31)	3 (1-17)	4 (1-15)	8 (1-17)	17 (4-43)	29 (8-35)
Retired	8 (7-33)	3 (1-17)	2 (1-15)	6 (1-20)	15 (4-38)	26 (13-35)
Unemployed	20 (10-31)	8 (1-19)	8.5 (1-19)	10.5 (1-19)	25 (3-48)	21 (5-33)
Smoking/*P* value				**.003**		
Yes	12 (7-31)	2 (0-15)	4.5 (1-19)	11.5 (1-19)	20 (10-43)	28 (8-32)
No	16 (2-35)	5 (1-20)	4 (0-20)	5 (1-21)	17 (3-53)	27 (5-35)
History of chronic disease/*P* value	**.021**	**.002**			**.006**	
Yes	19 (7-33)	7 (1-19)	4 (1-20)	6 (1-21)	21 (3-53)	25 (5-33)
No	11 (2-35)	4 (0-20)	4 (0-19)	5.5 (1-19)	16.5 (3-46)	28.5 (5-35)
History of psychiatric disease/*P* value	**0.008**		**0.002**	**0.020**	**0.001**	
Yes	20.5 (7-33)	7 (0-19)	7.5 (1-20)	11.5 (1-20)	22 (15-45)	22 (8-33)
No	11 (2-35)	5 (1-20)	3 (0-20)	5 (1-21)	17 (3-53)	28 (5-35)
History of psychiatric disease in the family						
Yes	20 (7-26)	5 (2-13)	8 (1-17)	7 (1-16)	21 (5-35)	21 (11-33)
No	14 (2-35)	5 (0-20)	4 (0-20)	6 (1-21)	18 (3-53)	28 (5-35)
Symptom/*P* value	**.033**	**.000**	**.026**		**.001**	
Yes	18 (2-35)	6 (0-20)	5 (0-20)	7 (0-21)	19 (3-53)	28 (5-35)
No	10.5 (7-33)	2 (1-14)	2 (1-14)	3 (1-20)	9.5 (3-35)	27 (15-35)
Cough/*P* value	**037**	**.028**			**.005**	
Yes	18 (7-35)	7 (0-19)	5 (1-20)	7 (0-21)	22 (3-53)	29 (5-35)

(*Continued*)

	Fear of COVID-19 Scale	DASS-21 Anxiety	DASS 21 Depression	DASS 21 Stress	DASS 21 Total	SWLS
No	12 (2-33)	4 (1-20)	3.5 (0-19)	5 (1-20)	16 (3-45)	26 (5-35)
Respiratory distress/*P* value	**.006**	**.000**		**.001**	**.000**	
Yes	19 (2-35)	7 (0-20)	6 (0-20)	9 (1-21)	28 (3-53)	24.5 (5-33)
No	11 (7-33)	4 (1-19)	4 (1-19)	4 (1-20)	16 (3-43)	28 (8-35)
Muscle and joint pain/*P* value		**.016**				
Yes	18 (7-31)	7 (1-20)	4 (0-15)	5 (1-21)	19 (3-45)	28 (10-35)
No	15 (2-35)	4 (0-19)	4 (1-20)	6 (1-20)	18 (3-53)	27 (5-35)
Fever						
Yes	11 (2-30)	5 (1-20)	2 (0-20)	6 (1-21)	18 (3-40)	28 (5-35)
No	16.5 (7-35)	5 (0-19)	5 (1-20)	6 (1-20)	18 (3-53)	26 (13-35)
Headache						
Yes	19.5 (7-31)	6 (0-19)	5 (1-20)	5.5 (1-19)	21 (4-53)	26 (8-33)
No	13 (2-31)	5 (0-20)	4 (0-19)	6 (1-21)	18 (3-48)	28 (5-35)
Sore throat/*P* value	**.027**			**.044**		
Yes	19 (11-30)	5 (1-10)	6 (1-17)	8 (1-19)	20 (3-46)	26 (2-35)
No	13 (2-35)	5 (0-20)	4 (0-20)	5 (1-21)	18 (3-53)	27.5 (5-35)
Olfactory and taste disorders/*P* value		**.019**	**.002**		**.031**	
Yes	18 (9-31)	8 (1-19)	8 (2-20)	7 (1-19)	24 (6-53)	30 (14-33)
No	14.5 (2-35)	4.5 (0-20)	3.5 (0-20)	6 (1-21)	17.5 (3-46)	27 (5-35)
Abdominal pain diarrhea/*P* value					**.019**	
Yes	7 (7-21)	7 (1-20)	12 (0-19)	8 (2-11)	28 (22-33)	32 (11-30)
No	15 (2-33)	5 (0-19)	4 (1-20)	6 (1-21)	18 (3-53)	27 (5-33)
Thorax CT findings/*P* value		**.044**		**.013**	**.004**	
Yes	18 (7-35)	5.5 (0-20)	5 (0-20)	7.5 (1-21)	19.5 (3-53)	28 (8-35)
No	11 (2-33)	4 (1-19)	2 (1-19)	3 (1-20)	12 (3-43)	26 (5-35)

*Mann–Whitney U test was used to compare two independent samples and Kruskal–Wallis test was used to compare more than two independent samples. The level of significance was set at P < .05. **The numerical values in the table are median (minimum-maximum) values.

When patients with pneumonia finding in thorax computed tomography (CT) and those with no pathological finding in thorax CT were compared, DASS-21 anxiety, DASS-21 stress, and DASS-21 total scores were found to be significantly higher in patients with pneumonia (*P*=.044, .013, and .004, respectively) (Table 2).

DISCUSSION

COVID-19, the first pandemic of the new century, has shocked the whole world and affected everyone. While deeply affecting social life and physical health, a pandemic of such dimension would certainly affect mental health as well. The opposite is unimaginable, because patients with confirmed or suspected COVID-19 may be afraid of the consequences of infection with a potentially deadly new virus, and patients in isolation may experience anxiety, depression, and stress. In addition, symptoms of infection, such as fever, respiratory distress, and cough, can affect mental health from a body–mind integrity perspective.[2,3] This pandemic would obviously affect people's psychological situation since all media and social networks were constantly talking about it. A study investigating the prevalence of anxiety symptoms and anger in individuals isolated during the Middle East Respiratory Syndrome (MERS) epidemic found anxiety symptoms in 47% and a feeling of anger in 52.8% of MERS patients during isolation. Moreover, the same study found high levels of anxiety and anger in patients with a history of psychiatric disease, even 4-6 months after being removed from isolation.[17]

Since psychiatric disorders involve neurotransmitter abnormalities in the cerebrum, these patients seem to have poor control of anxiety and anger symptoms related to the emotional center.[2,18] In patients with Covid-19, studies on the psychological impact done so far have generally examined psychologically healthy individuals. So, our present study is important because it has been performed on directly affected people by COVID-19. In this context, first, we would like to emphasize essential

findings of the present study: (i) DASS-21 anxiety and total scores were higher in female patients than males; (ii) fear of COVID-19 scale, DASS-21 anxiety, depression, and total scores were higher in married patients than single ones; (iii) patients living in rural areas had a higher fear of COVID-19 scale, DASS-21 depression and total scores, and lower Life Satisfaction Scale scores compared to those living in city centers; (iv) patients with any chronic illness and psychiatric disorder had a higher fear of COVID-19 scale, DASS-21 anxiety, and total scores; (v) the presence of respiratory symptoms and positive CT pneumonia were closely related to higher scale scores.

The psychological impact of the COVID-19 has been begun to examine, starting in China. The first psychological impact and mental health survey performed in China found that more than half of 1210 participants reported the psychological impact as moderate-to-severe and about one-third rated moderate-to-severe anxiety.[19] On the other hand, it has been begun to use specific terms to account for the fear of coronavirus infection as "coronaphobia".[20] In these circumstances, it can be expected that all types of psychiatric disordered patients may be negatively affected by the fear of COVID-19. Population with any psychiatric disorder might be more susceptible to the emotional responses loaded by the COVID-19 pandemic compared to the general public, causing relapses or worsening of an already existing psychiatric disorder.

In the present study, we detected that DASS-21 anxiety and total scores were higher in female patients than male ones. This does not seem to be a surprise. Because females are prone to be affected by stressful events. Because of the fact this pandemic is already an important stress factor for all over the world, female patients were more influenced by this condition. Moreover, married patients had higher scores on the fear of COVID-19 scale and DASS-21 anxiety, depression, and total compared to those of single patients. This can be linked to the responsibility associated with marriage. Since married females felt the need to protect their families against COVID infection, higher scale scores can be expected. In the present study, we detected that patients living in rural areas had higher fear of COVID-19 scale, DASS-21, depression, and total scores, and lower Life Satisfaction Scale scores compared to those living in city centers. This was an interesting finding. We can speculate that in city centers individuals, compared to those living in rural areas, can access real-time information more easily and quickly. Knowledge itself may be preventing people from fear of the COVID-19 at least partially. We also found that patients with any chronic illness and psychiatric disorder had higher fear of COVID-19 scale, DASS-21 anxiety, and total scores than those without any chronic illnesses. The association between the presence of comorbid psychiatric disorder and higher scale scores is understandable because comorbid psychiatric conditions can increase a trend toward anxiety and fear. As for chronic illness comorbidity, health authorities have constantly warned people who have any medical illness to take meticulous precaution against COVID-19. These warnings could have affected patients with chronic illness and frightened them. As a result, it may have been reflected in the data.

On the other hand, we determined that the presence of respiratory symptoms and positive CT pneumonia were closely related to higher scores. We should note that since the beginning of the pandemic, respiratory symptoms have been emphasized as the most critical findings of COVID-19. This was both implicated by health authorities and the media. Especially in from the first days of the pandemic in our country, the lung findings of COVID-19 patients were scanned with thorax CT. It would be more correct to correct the sentence in this way. The positive finding of CT has been linked to a worse clinical situation. On the other hand, positive CT was directly linked to breathlessness. Our findings showing that the presence of respiratory symptoms and positive CT pneumonia were closely related to higher scale scores might be associated with all the above-mentioned factors.

Our present study has some limitations. When interpreting the study, these limitations should be taken into consideration. First of all, we did not use any control group in the study. This was a limitation. Second, because of the actual conditions, we could not evaluate patients face-to-face, and we evaluated solely through a telephone call. This method might have affected our results, as the motivation was to finish the interview as soon as possible. Another limitation was that self-reported levels of psychological impact on anxiety, depression, or stress might not always be aligned with the assessment of mental health professionals. Consequently, we suggest that the COVID-19 outbreak seems to also affect patients psychologically. This influence is more in COVID-19 positive patients who were females, married, those living in rural areas, ones with chronic medical or psychiatric disorder, and those with respiratory symptoms, and positive CT findings. Future studies with face-to-face interviews are needed to further prove this observation.

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