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Özgün araştırma

COVID-19 Korkusu: Kistik Fibrozisli Hastalarda Psikososyal Faktörler ve Yaşam Kalitesi Üzerine Etkileri

Elif Kabasakal[1], Pınar Kaya Ciddi[2]

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Öz

Amaç: Kronik bir hastalık olan Kistik Fibrozis (KF) tanılı bireylerde pandemi sürecinde psikososyal etkiler ortaya konmuş ve tutarsız sonuçlar gözlenmiştir. Bu çalışma, KF'li bireylerde Koronavirüs (COVID-19) pandemisinin anksiyete, depresyon ve yaşam kalitesi (YK) seviyeleri üzerindeki etkilerini araştırdı.
Gereç ve Yöntemler: Çalışmaya dahil edilen tüm katılımcıların verileri, biri KF'li bireyler ve diğeri genel popülasyon (GP) kontrolleri için olmak üzere iki internet tabanlı anket aracılığıyla toplanmıştır. İki anket versiyonunda da araştırmacılar tarafından hazırlanan benzer sorular vardı. KF'li bireyler için olan anket, KF hedefli sorularla zenginleştirildi. Ayrıca her iki ankette de COVID-19 Korkusu Ölçeği, Hastane Anksiyete Depresyon Ölçeği (HADÖ) ve Dünya Sağlık Örgütü YK Ölçeği Kısa Formu (DSÖYK-KF) soru maddeleri yer aldı.
Bulgular: KF'li 64 birey ve 70 GP kontrolü anketleri tamamladı. KF'li bireyler, GP kontrollerine göre COVID-19 korkusu, anksiyete, depresyon ve düşük YK seviyelerine sahipti ($p<0,001$). KF'li bireylerde COVID-19 korkusunun anksiyete ($R^2=0,506$; $p<0,001$), depresyon ($R^2=0,337$; $p<0,001$) ve YK'nin genel sağlık durumu ($R^2=0,095$; $p=0,013$), fiziksel ($R2=0,239$; $p<0,001$), psikolojik ($R^2=0,275$; $p<0,001$) ve çevresel ($R^2=0,179$; $p<0,001$) sağlık YK alanları üzerinde önemli etkileri olduğu, ancak sosyal ilişkiler üzerinde ($p>0,05$) anlamlı etkisi olmadığı görüldü. GP kontrollerinde, COVID-19 korkusunun anksiyete ve depresyon üzerinde anlamlı etkileri vardı ($p<0,05$), ancak herhangi bir YK alanı üzerinde yoktu ($p>0,05$).
Sonuç: Çalışmadaki bulgularımıza göre, COVID-19 korkusundaki artışın KF'li bireylerde anksiyete, depresyon ve YK üzerinde olumsuz etkisi vardı. KF'li bireylerdeki psikososyal etkilenimler gelecekteki kesitsel çalışmalarla, olası bir pandemi ve karantina durumunda daha iyi takip edilebileceğini ve önlemlerin alınabileceğini düşünmekteyiz.
Anahtar Kelimeler: *Anksiyete, COVID-19, Depresyon, Kistik Fibrozis, Yaşam Kalitesi*

[1]**Elif KABASAKAL.** İstanbul Medipol Üniversitesi, Sağlık Bilimleri Fakültesi, Fizyoterapi ve Rehabilitasyon Bölümü, İstanbul, Türkiye. Tel No: 05347093738, E-posta: elifkabasakal1@gmail.com
[2]**Pınar KAYA CİDDİ (Sorumlu Yazar).** İstanbul Medipol Üniversitesi, Sağlık Bilimleri Fakültesi, Fizyoterapi ve Rehabilitasyon Bölümü, İstanbul, Türkiye. Tel No: 05415909667, E-posta: pkaya@medipol.edu.tr

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Original Research

The Fear of COVID-19: Effects on Psychosocial Factors and Quality of Life in Patients with Cystic Fibrosis

Elif Kabasakal[1], Pınar Kaya Ciddi[2]

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Abstract

Objective: Psychosocial effects have been reported in patients with cystic fibrosis (pwCFs), which is chronic disease, and inconsistent results were observed in pandemic between studies. This study investigated the effects of Coronavirus (COVID-19) pandemic on anxiety, depression and quality of life (QoL) levels among pwCFs.
Material and Methods: The data of all participants included in the study were collected through two web-based questionnaires, one for pwCFs and general population (GP) controls. Two questionnaire versions had similar questions, prepared by the researchers. The pwCFs questionnaire augmented with CF targeted questions. Also, both questionnaires included COVID-19 Fear Scale, Hospital Anxiety Depression Scale (HADS) and World Health Organization QoL Scale Short Form (WHOQOL-Bref) question items.
Results: Sixty-four pwCFs and seventy GP controls completed the questionnairesCompared to GP controls, pwCFs had increased fear of COVID-19, anxiety, depression, and decreased QoL levels ($p<0.001$). The fear of COVID-19 had significant effects on anxiety ($R2=0.506$; $p<0.001$), depression ($R2=0.337$; $p<0.001$), and QoL domains of general health status ($R2=0.095$; $p=0.013$), physical ($R2=0.239$; $p<0.001$) and psychological health ($R2=0.275$; $p<0.001$), and environment ($R2=0.179$; $p<0.001$), but not on social relationships ($p>0.05$) in pwCFs. In GP controls, the fear of COVID-19 had significant effects on anxiety and depression ($p<0.05$), but not on any QoL domains ($p>0.05$).
Conclusion: According to our study findings, theincrease in fear of COVID-19 had a negative impact on anxiety, depression and QoL in pwCFs.Psychosocial influences in pwCFs need to be further investigated in future cross-sectional studies in case of a possible pandemic and lockdown.

Keywords: *Anxiety, COVID-19, Depression, Cystic fibrosis, Quality of Life*

[1]**Elif KABASAKAL.** Istanbul Medipol University, Faculty of Health Science, Department of Physiotherapy and Rehabilitation, İstanbul, Turkey. Phone Number: 05347093738, E-mail: elifkabasakal1@gmail.com
[2]**Pınar KAYA CİDDİ (Corresponding Author).** Istanbul Medipol University, Faculty of Health Science, Department of Physiotherapy and Rehabilitation, İstanbul, Turkey. Phone Number: 05415909667, E-mail: pkaya@medipol.edu.tr

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Introduction

Cystic fibrosis (CF) is an autosomal recessive lung disease with multisystem involvement, especially chronic complications in the respiratory and digestive systems (Abdelbasset et al., 2018). The most common cause of mortality in the CF community is pulmonary complications (Rafeeq et al., 2017). Due to the symptoms of CF and the challenges of the treatment process, patients with CF (pwCFs) may experience more negative psychological effects, such as anxiety and depression than the healthy population (Bell et al.,2020; Havermans and Willem, 2019). Although their average life expectancy increases with the advances in medical treatments, there is a decrease in the quality of life (QoL).

The novel COVID-19 first emerged in the Hubei province of China. As a result of the examinations, it was found that the disease was caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) (Atzrodt et al., 2020). Symptoms and severity of disease may vary between individuals; cough, myalgia, fever, and fatigue are the most common symptoms, while in some cases, vomiting, diarrhea, and headache are seen rarely. As well as mild cases with signs of low fever and fatigue without pneumonia, also life-threateningcomplications such as severe respiratory failure, severe pneumonia, and multi-organ failure may occur (Wang et al., 2020). Older adults and individuals with a weak immune response and comorbidities are at greater risk (Ejaz et al., 2020). Patients with CF also have been reported as a high-risk population during pandemic (Peckham et al., 2020). Gene mutations in CF disease affect the multiprotein inflammatory complex and cellular metabolism. Thus, COVID-19 whichcauses acute respiratory distress syndrome infection may spread infection and lead to cytokine storm in CF (Peckham et al., 2020).

The fear that is embedded in human nature because of historical epidemics is triggered by the SARS-CoV-2 again (Parlapani et al., 2020). The frightful impact of the COVID-19 on the general population is associated with its unfamiliar nature related with mortality, and infectiblityof the virus (Asmundson and Taylor, 2020). The level of this fear varies depending on many factors, such as comorbidities, age, and the mental health status of the individual (Parlapani et al., 2020). Factors, such as increasing death rates, availability of little information about the mechanism and course of the disease, quarantine, mask use have psychological impact on individuals. Moreover, the fear of COVID-19is also triggered by the disinformation on social mediaon social media, the fear of infecting others, accessing basic needs and financial concerns (Asmundson and Taylor, 2020). In a study conducted in China in 2020, it was reportedthat negative emotions increased, life satisfaction and happiness decreased significantly with the pandemic in general population (Li et al., 2020).

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There is a clear evidence that the mental health and QoL of individuals diagnosed with chronic diseases are adversely affected. Moreover, studies have shown that COVID-19 affects the QoL and psychosocial status of individuals with various chronic diseases more than the healthy population (Al-Rahimi et al., 2021; Voorend et al., 2021, Luber et al., 2022). Psychosocial effects have been reported in pwCFs who have chronic and risky situation during the pandemic period, and inconsistent results have been observed (Senkalfa et al., 2022; Westcott et al.,2021; Graziano et al., 2021; Havermans et al., 2020). There are research that demonstrate the COVID-19 pandemic has a negative psychosocial impact on pwCFs (Havermans et al., 2020; Graziano et al., 2021), but other studies show that this impact is comparable to healthy people (Senkalfa ve ark., 2022; Ciprandi ve ark., 2021). In comparison to pre-COVID-19 pandemic, research in Italy and England indicated that the anxiety and depression levels of pwCFs had increased (Graziano et al., 2020; Westcott et al., 2021). Additionally, pwCFs were reported to experience less psychological distress than healthy controls in other research conducted in Italy during the COVID-19 pandemic (Ciprandi et al., 2021). A study in Turkey, children with CF showed lower levels of anxiety than their healthy classmates during the pandemic period (Senkalfa et al., 2022). More studies are needed to provide information to guide psychosocial approaches in the management of pwCFs during and the end of pandemic (Senkalfa et al., 2022).

The aim of this study was to investigate the effects of COVID-19 fear on anxiety, depression, and QoL among pwCFs. We hypothesized that the fear of COVID-19 experienced by pwCFs during the pandemic would negatively affect their anxiety, depression, and quality of life. With the results obtained in our study, we thought that analyzing the health status of pwCFs with a psychosocial approach can provide support in the planning of therapy processes and affect the disease picture positively.

Material and Methods

Participants and Procedure

Two groups, adolescent and adult pwCFs and the general population (GP), were investigated through 2 online questionnaires. The survey was conducted via the GoogleForms® platform (Google LLC, Mountain View, CA, USA). This study was carried out between October 1th and December 25th of 2021, and the surveys for two groups were open from November 1st to December 1st of 2021. PwCFs were informed aboutthe survey through WhatsApp messages by the Turkish Cystic Fibrosis Association. The general population data was collected by snowballing sampling technique. Information and request to consent about the

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study were included at the beginning of the questionnaire. All participants marked the check box below the written informed consent. A link to the questionnaire was sent to 140 participants, 65 pwCFs and 75 GP controls, and they completed questionnaires. The criteria for study inclusion were (a) being 16 years of age or older, (b) being able to use data collectionsystems successfully to complete the questionnaires, and (c) being volunteer to participate in the survey. For pwCFs to be included in the trial, patients also had to have received a CF diagnosis. The exclusion criteria of the study were (a) current treatment with sedative and antiepileptic drugs, (b) a history of mental illness (psychiatric treatment for severe clinical anxiety and/or depression), and (c) being pregnant. As a result of the literature review, the total sample size was found to be n =128 using the G-Power program with 0.80 effect size, 85% power (Havermans et al., 2008). This survey was ethically approved by Istanbul Medipol University Non-Invasive Research Ethics Committee (the decision number: E-10840098-772.02-5848) and the Scientific Research Platform of the Ministry of Health (the decision number: 18_48_54).

Questionnaires

The data of all participants included in the study were collected through two web-based questionnaires, one for pwCFs and one for GP controls. These questionnaires include questions regarding the demographic information as well as those determined by the researchers through the literature review (Havermans et al., 2020; Radtke et al., 2020). In both questionnaire versions for GP population and pwCFs, there were nine questions, prepared by the researchers in addition to demographic information, regarding vitamin intake, routines, physical condition, sleep quality changes, time spent with family/friends during lockdown, behavioral changes related to pandemic, and feeling demoralized and/or discouraged about the future. In addition to the similar 9 questions, 12 more questions were added for pwCFs and a total of 21 questions were asked in the questionnaire. These 12 questions were about the changes in the treatment processand routines, physiotherapy sessions and home exercises during the pandemic in pwCFs questionnaire. All these questions were scored with a 3-point scale as 'never,' 'sometimes' and 'often.' In addition to the questionnaire, individuals completed the COVID-19 Fear Scale, Hospital Anxiety Depression Scale (HADS), and World Health Organization QoL Scale Short Form (WHOQOL-Bref).

COVID-19 fear levels of the participants were determined with the 'COVID-19 Fear Scale' developed by Ahorsu et al. in 2020 (Ahorsu et al., 2020). This scale, which Turkish validity and reliability were conducted by Bakioğlu et al., is a one-dimensional instrument consisting of seven items with robust psychometric properties that measure the fear of COVID-

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19. The scale has a 5-point Likert-type scoring system (1: I strongly disagree, 5: I strongly agree). High scores obtained from this scale, assessed in the range of 7-35 points, indicate that the individual has a high level of fear of COVID-19. (Bakioglu et al., 2021).

Anxiety and depression levels of participants were measured with the HADS, developed by Zigmond and Snaith in 1983 (Zigmond & Snaith, 1983). This scale consists of 14 items, seven items investigating anxiety and seven items investigating depression, and it provides measurement with a 4-point Likert system. The Turkish validity and reliability study of the scale was carried out by Aydemir et al. in 1997. The lowest score that patients can have from both subscales is 0, and the highest score is 21. As a result of studies conducted in Turkey, the cut-off score was 10/11 for the anxiety subscale, and 7/8 for the depression subscale. High scores indicate high risk about anxiety and depression. (Aydemir et al.,1997).

The QoL of participants was assessed with the WHOQOL-Bref, which is an internationally comparable assessment tool developed by WHO. The Turkish version of the 26-item scale which includes the domains of psychological health, environment, physical health, and social relations, consists of 27 items. The 27th item in the Turkish version is the national environmental domain. The scale has a 5-point Likert rating system. The score of each domain is important, and high scores indicate good QoL. The domain scores range from 4 to 20 points. (Eser et al., 1999).

Statistical Analysis

The SPSS 25.0 software program (IBM Corp., Armonk, NY, USA) was used for statistical analysis. Descriptive statistical methods (number, percentage, mean, standard deviation) were used while evaluating the data. Whether the data were normally distributed was tested with skewness and kurtosis statistics and distribution measures such as coefficient of variation, in addition to graphical methods (histogram, Q-Q plot and box plot). It was determined that the scale scores met the assumption of normal distribution. Independent samples t-test was used for intergroup comparisons. The effects of the independent variable on the dependent variables were analyzed by simple linear regression analysis. The comparison of categorical data wasexamined by chi-square analysis. The significance level was accepted as $p<0.05$.

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Results

Demographic Information

The demographic information of the participants is shown in Table 1. While there was no difference between the age and gender distribution of the participants in both groups (p=0.534), The Body Mass Index (the BMI) values of pwCFs were lower than those of GP controls (p<0.001). The rate of being diagnosed with pancreatic and liver disorders and diabetes mellitus as well as the number of recent hospitalizations were higher (p<0.001) in pwCFs than GP controls. The pwCFs took more real-time polymerase chain reaction (RT-PCR) tests (p=0.028), but the rate of getting infected with COVID-19 was not different between the groups (p=0.131). It was determined that 95.3% of pwCFs spent the quarantine with their family/caregiver.

Table 1: Baseline characteristics of patients with CF and GP controls

	Patients with CF (n = 64)	**GP Controls (n =70)**	**X^2**	**p**
Female, n (%)	37 (57.8)	41 (58.6)	0,008	0.534
Male, n (%)	27 (42.2)	29 (41.4)		
Age, avg (SD)	24.25 (6.16)	25.92 (5.05)		0.086
BMI, avg (SD)	21.04 (2.69)	24.18 (4.01)		**<.001****
Medical comorbidities, n (%)				
Pancreatic Insufficiency	51 (79.7)	0 (0.0)	90,056	**<.001****
Liver Disease	11 (17.2)	2 (2.9)	7,0837	**.005****
Diabetes Mellitus	19 (29.7)	2 (2.9)	18,211	**<.001****
Number of hospitalizations in the last one year, n (%)				
0	29 (45.3)	66 (94.3)	39,049	
1-3	31 (48.4)	4 (5.7)		
4-7	3 (4.7)	0 (0.0)		**<.001****
8 and more	1 (1.6)	0 (0.0)		
SARS- CoV-2 infection situation, n (%)				
SARS- CoV-2 infection	12 (18.8)	21 (30.0)	2,280	0.131
Taking RT-PCR test	50 (78.1)	21 (30)	4,389	**.028***
Habitation during lockdown, n (%)				
Family/ Caregiver	61 (95.3)	55 (78.6)	8,708	**.013***
Friend	2 (3.1)	5 (7.1)		
Alone	1 (1.6)	10 (14.3)		
COVID-19 Fear Scale, avg (SD)	22.97 (5.1)	17.99 (5.44)		**<.001****
HADS, avg (SD)				
Anxiety	8.73 (3.56)	5.07 (2.69)		**<.001****
Depression	8.11 (3.09)	3.96 (2.51)		**<.001****
WHOQOL-Bref, avg (SD)				
General Health	5.09 (1.18)	7.33 (1.42)		**<.001****
Physically Health	20.78 (3.05)	27.67 (3.87)		**<.001****
Psychological	18.22 (3.11)	22.47 (2,94)		**<.001****
Social Relationship	9.66 (1.79)	10.91 (2.3)		**.001****
Environment	25.48 (3.77)	28.93 (3.93)		**<.001****

*CF: Cystic Fibrosis, BMI: Body Mass Index, RT-PCR: Real Time Polymerase Chain Reaction, HADS: Hospital Anxiety Depression Scale, WHOQOL-Bref: World Health Organization Quality of Life Questionnaire-Bref, *: p < 0.05, **p < 0.01*

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Analysis of the Questionnaire

The comparisons of the scales' scores are shown in Table 1. The pwCFs had increased fear of COVID-19, anxiety, and depression levels compared with GP controls ($p<0.001$). The GP controls had higher general health status, physical health, psychological, environmental ($p<0.001$) and social relations ($p=0.001$) scores than pwCFs.

Figure 1 shows the analysis of the responses given by pwCFs to the survey questions. It was reported that 48% of the participants did not increase their CF medical treatment, and 45.3% of themincreased it intentionally sometimes, 76.6% of them did not skip it, and 70% of them made changes in their medical treatment schedules sometimes. Changes in treatment routines were reported as sometimes in 57.8% and often in 23.4%. The interruption frequency of participants home exercises was reported; 34.3% as never, 43.7% as sometimes, and 21.8% as often. Over 40% of the respondents stated that they did not do home exercises sometimes, 42.1% of them never did; 60.9% did sometimes and 23.4% of them often changed the time schedules of home exercises. Most of the respondents reported that they were never visited by a physiotherapist at home, and 46.9% of them visited sometimes and 25% of them often interrupted their clinical physiotherapy sessions, but 45.3% of them continued their physiotherapy practices at home alone or with a caregiver. It was reported that over 50% of them sometimes made changes in the content of the physiotherapy program, while 26.6% of them reported that they never did.

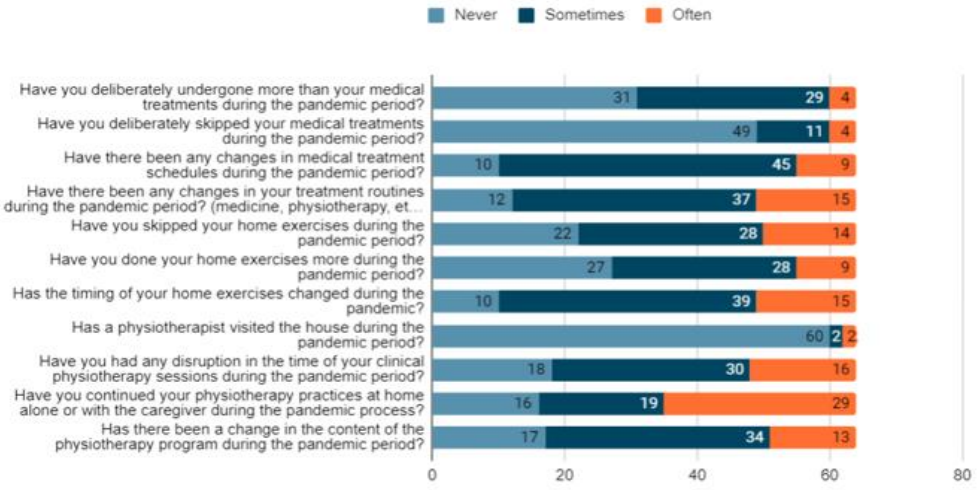

Figure 1: Analysis of questionnaire in pwCFs

The comparison of the questionnaire analysis results between the pwCFs and the GP controls are shown in Table 2. The pwCFs reported that their general routines changed more ($p=0.002$), their physical condition was more negatively affected ($p=0.013$), and their sleep quality decreased more than GP controls ($p<0.05$) during the pandemic. It was found that

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pwCFs had more behavioral changes related to COVID-19 (p<0.001), were more demoralized (p=0.027) and discouraged (p=0.038) about the future than GP controls.

Table 2: Comparison of Questionnaire Analysis Results Between Groups

		Patients with CF n (%)		GP Controls n (%)		X^2	p
Did you take more vitamins during the pandemic period?	Never	9	14.1	14	20.0		
	Sometimes	24	37.5	33	47.1	3.431	0.180
	Often	31	48.4	23	39.9		
Have there been any changes in your general routines during the pandemic period?	Never	4	6.3	10	14.3		
	Sometimes	17	26.6	34	48.6	12.182	**.002****
	Often	43	67.2	26	37.1		
Do you feel your physical condition deteriorating during the pandemic period?	Never	4	6.3	15	21.4		
	Sometimes	43	67.2	46	65.7	8.680	**.013***
	Often	17	26.6	9	12.9		
Has your sleep quality decreased during the pandemic period?	Never	5	7.8	20	28.6		
	Sometimes	40	62.5	40	57.1	11.548	**.003****
	Often	19	29.7	10	14.3		
Has there been a decrease in the time you spend with your family members due to the risk of COVID transmission during the pandemic period?	Never	20	31.3	19	27.1		
	Sometimes	28	43.8	36	51.4	0.791	0.673
	Often	16	25.0	15	21.4		
Has the time you spent with your friends decreased due to the risk of COVID transmission during the pandemic period?	Never	4	6.3	4	5.7		
	Sometimes	10	15.6	21	30.0	3.906	0.142
	Often	50	78.1	45	64.3		
Have you had any behavioral changes related to COVID-19?	Never	4	6.3	15	21.4		
	Sometimes	10	15.6	34	48.6	31.098	**<.001****
	Often	50	78.1	21	30.0		
Do you feel demoralized about the future?	Never	1	1.6	8	11.4		
	Sometimes	45	70.3	51	72.9	7.255	**.027***
	Often	18	28.1	11	15.7		
Do you feel discouraged about the future?	Never	4	6.3	11	15.7		
	Sometimes	41	64.1	49	70.0	6.515	**.038***
	Often	19	29.7	10	14.3		

*CF: Cystic fibrosis, *: p < 0.05, **: p < 0.01.*

The Effects of COVID-19 Fear Scale Scores on Anxiety, Depression, and QoL Scores

The effects of the COVID-19 Fear Scale scores of pwCFs on their anxiety, depression and QoL levels are shown in Table3. According to the results of a simple linear regression analysis performed on pwCFs, the fear of COVID-19 had significant effects on anxiety (R^2=0.506; p<0.001), depression (R^2=0.337; p<0.001), general health status (R^2=0.095; p=0.013), physical health (R^2=0.239; p<0.001), psychological health (R^2=0.275; p<0.001) and environment (R^2=0.179; p<0.001) factors, but not in social relationships (R^2=0.024; p=0.224).

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The effects of COVID-19 fear scores of the GP controls on their anxiety, depression and QoL levels are shown in Table4. According to the results of the simple linear regression analysis performed on GP controls, the effect of fear of COVID-19 was significant on anxiety (R^2=0.108; p=0.005) and depression (R^2=0.057; p=0.047), but not on QoL domains (p>0.05).

Table 3: The effects of COVID-19 fear scores on anxiety, depression and QoL scores in pwCFs

The dependent variable	ß	Std. Error	Beta	t	F	Model (p)	R^2	Dubin Watson
Anxiety	0.497	0.062	0.711	7.968	63.491	**<.001****	0.506	2.005
Depression	0.352	0.063	0.580	5.609	31.458	**<.001****	0.337	2.078
General Health	0.071	0.028	0.309	-2.555	6.529	**.013***	0.095	2.158
Physical Health	0.292	0.066	-0.489	-4.412	19.463	**<.001****	0.239	2.341
Psychological	-0.320	0.066	-0.524	-4.847	23.497	**<.001****	0.275	1.680
Social Relationships	-0.054	0.044	-0.154	-1,227	1.506	.224	0.179	1.495
Environment	-0.313	0.085	-0.423	-3.681	13.549	**<.001****	0.179	1.495

*: $p < 0.05$, **: $p < 0.01$.

Table 4: The effects of COVID-19 fear scores on anxiety, depression and QoL scores in GP controls

The dependent variable	ß	Std. Error	Beta	t	F	Model (p)	R^2	Dubin Watson
Anxiety	0.163	0.057	0.329	2.875	8.264	**.005****	0.108	1.878
Depression	0.110	0.054	0.239	2.026	4.103	**.047***	0.057	0.178
General Health	0.040	0.031	0.154	1.287	1.656	0.203	0.024	1.415
Physical Health	-0.005	0.086	-0.006	-0.053	0.003	0.958	0.000	1.774
Psychological	0.086	0.065	0.159	1.328	1.764	0.189	0.025	2.105
Social Relationships	0.080	0.050	0.190	1.597	2.550	0.115	0.036	1.1997
Environment	0.169	0.085	0.234	1.983	3.931	0.051	0.055	1.899

*: $p < 0.05$, **: $p < 0.01$.

Discussion

In this study, we planned to determine the effects of the fear level of COVID-19on the psychosocial factors and QoL in pwCFs during the COVID-19 pandemic. According to the findings, it was observed that as fear levels increased, anxiety and depression levels also increased, but the QoL levels decreased in the pwCFs. While fear of COVID-19 negatively affected the QoL in the pwCFs, such an effect was not observed in the GP controls. Also, the pwCFs reported more changes in their general routines, feeling of worsening physical condition, decreased sleep quality, behavioral changes, demoralized and discouraged feelings about the future related to COVID-19 pandemic.

It is thought that fear and anxiety underlie the negative consequences of the pandemic on mental health. In the general population, the relationship between fear of COVID-19and

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level of positivity is affected by conditions, such as depression, anxiety, stress, and intolerance of uncertainty (Bakioglu et al., 2021). Mailliez et al. (2021) reported that participants' fear levels and negative feelings, such as anxiety, depression and anger, sadness and fear affect the relationship between fear of COVID-19and indicators of emotional discomfort (Mailliez et al., 2021). In the study conducted by Bäuerle et al., it was reported that 59% of participants had a fear of COVID-19, 44% had general anxiety and 14% had depression symptoms, and the prevalence of anxiety and depression increased in the German population compared to pre-pandemic (Bäuerle et al., 2020). In our study, GP controls also showed a higher level of anxiety and depression levels related to increased fear of COVID-19, along with with other studies. Violant-Holz et al., indicated that the most mental health problems reported by the adult population were anxiety, depression and sleep problems in their review conducted during the pandemic (Violant-Holz et al., 2020). In a study carried out in China, where the pandemic originated, participants had symptoms of anxiety and depression, and decreased sleep quality during the pandemic (Huang et al., 2020). In our study, it was found that the pandemic negatively affected both pwCFs and GP controls in the terms of psychosocial domains. The results of our study support the idea that it is important to be aware of mental health problems for all populations and to conduct psychological support activities to meet individuals' needs during the COVID-19 pandemic.

It has been reported that evidence about effects of pandemic on pwCFs is insufficient (Senkalfa et al., 2022). In a study conducted in Belgium, the effects on self-reported changes in treatment routines at home and their mood during the early periods of the pandemic were investigated in CF patients (Havermans et al., 2020). In the study, 40% of the participants reported negative effects on their sleep quality; 58% were discouraged about their future; and 64% received their physiotherapy at different times, 30% received less physiotherapy and 52% reported that they did not increase the frequency of their exercise compared to their previous routine (Havermans et al., 2020). Also, the children with CF included in the study continued their therapy at home under the supervision of a physiotherapist (Havermans et al., 2020). Radtke et al. (2020) investigated the changes in treatments of CF patients during lockdown (Radtke et al., 2020). It was stated that 45% of participants reported to do less physical activity due to closed gym facilities and physiotherapy centers, lack of motivation and canceled supervised training; 9% perform airway clearance and 2% inhalation therapy less frequently (Radtke et al., 2020). Their physiotherapy timing and routines changed but some patients continued virtual exercise sessions at home (Radtke et al., 2020). In our study, it was also determined that the pwCFs experienced disruptions in therapy routines during the pandemic.

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These disruptions may have adversely affected the mental health of individuals as well as their physical health. Telehealth methods could be used for treatment compliance, type, and intensity of exercise, change in treatment routines, and monitoring mental health during a pandemic.

According to studies, due to the pandemicit has been determined that COVID-19fear and psychosocial distress levels are higher in patients with chronic diseases such as hypertension, diabetes, rheumatoid arthritis, cancer, renal disease and asthma compared to healthy individuals (Al-Rahimi et al., 2021; Voorend et al., 2021; Bakioglu et al., 2021; Malliez et al., 2021; Korukcu et al., 2021). It has been reported that depressive symptoms of patients with chronic renal disease increased from 11% to 22%. 15% of patients had HADS score asabove 8 points that indicates abnormal anxiety level, and physical health domain of the QoL decreased compared to pre-pandemic (Voorend et al., 2021). The authors suggested that long-term recovery effects can be achieved with emotional and cognitive psychological interventions planned according to the needs of the patients with chronic diseases as a result of screenings (Voorend et al., 2021). Doğan et al. (2021) reported high levels of the fear of COVID-19and anxiety for future, and sleep problems due to the fear of COVID-19in liver transplant patients (Dogan et al., 2021). In our study, the pwCFs reported that they feel more demoralized and discouraged about the future, and had decreased sleep quality than GP controls. These results suggest that demoralizing situations, such as hearing the news about individuals who contracted the COVID-19or died during the pandemic period may increase perceived risk and future anxiety, and may negatively affect daily life functions such as sleep, in pwCFs. According to the results of this study, analyzing the health status of pwCFs with a psychosocial approach during pandemic processes can support the planning of treatment processes and positively affect the disease picture. In addition, psychosocial assistance and rehabilitation support for individuals with CF may be beneficial.

According to a single-center study conducted in the United Kingdom, pre-pandemic anxiety levels of pwCFs increased from 27% to 54% (Westcott et al., 2021). High levels of anxiety and depression symptoms were recorded in pwCFs during a lockdown intervention study in Italy; symptoms were reduced after four sessions of telemedicine therapy. Rhoads et al. (2021) found depression symptoms in 10% of pwCFs and anxiety symptoms in 33%, and they observed that these values showed an increase compared to the pre-pandemic period (Rhoads & Banerjee, 2021). In a study conducted in the USA during the pandemic, moderate to severe depression and anxiety symptoms, and suicidal ideation were observed in 12%, 13%, and 3.1% of pwCFs, respectively (Smith et al., 2021). Simonson et al. (2022) investigated the impact of the first wave of the pandemic on pwCFs and found that the anxiety rate, increased

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from 43% to 58%, and the depression tendency, increased from 39% to 45% (Simonson et al.,2022). According to the current study, pandemic had a more significant impact on pwCFs' levels of anxiety and depression levels than GP controls. These results suggest that pwCFs would need psychological interventions during various lockdown periods.

There is some evidence indicating that pwCFs are not more affected in psychosocial terms than healthy people (Ciprandi et al., 2021; Senkalfa et al., 2022; Benecke et al., 2022) During the pandemic, symptoms of anxiety and depression were equal or even less in adults with CF compared to the healthy control group in some regions of Italy (Ciprandi et al., 2021). In another study, carried out in Turkey, investigating the psychological effects of the COVID-19 pandemic, children with CF showed lower levels of anxiety symptoms than their healthy peers (Senkalfa et al., 2022). In another study conducted in Germany, individuals' fear of COVID-19, psychological burden related to the pandemic, safety behavior and subjective health risk perception were questioned (Benecke et al., 2022). They found that pwCFs had higher health risk perception and COVID-19 fear, but no higher psychological burden than in healthy controls (Benecke et al., 2022). According to a study in Poland, depression levels in pwCFs did not significantly increase during the pandemic compared to the pre-pandemic period (Humaj-Grysztar et al., 2022). Studies carried out during the pandemic might have produced different findings in other nations and at various dates. The inconsistency in results between our study and previous studies may be due to the different study execution times. Previous studies were carried out in the first six months of 2020, that is, at the beginning and early phases of the pandemic (Ciprandi et al., 2021; Senkalfa et al., 2022; Benecke et al., 2022). Due to the nature of their illness, people with pwCF have a solid understanding of the principles of hygiene and social isolation (Kumar & Goyal., 2020), which may have contributed to their psychosocial effects being comparable to those of healthy people at early phases of the pandemic. Our investigation was carried out in the later phases of the COVID-19 pandemic, not in the early, in contrast to prior studies that revealed contradiction with our findings. During this time of the pandemic, there were a lot of fatalities, and it became obvious that people with chronic conditions were a particularly dangerous group. Furthermore, during the pandemic period in which our study was conducted, there was confusion regarding the number of cases in various nations. It's uncertain whether a new wave will come along soon and alter the situation once more. Many countries might re-impose isolation and quarantine rules if a situation like this arises. Given the contradictory findings of prior cross-sectional studies, it is recommended that the psychosocial effects of pwCFs be monitored across various pandemic times.

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CF is a progressive disease that causes a decrease in the QoL, although there are some developments in healthcare delivery (Bell et al., 2020). In our study, it was observed that the general health status, physical health, psychological and environmental sub-dimensions of QoL in pwCFs were negatively affected in the pandemic. According to our findings, multidisciplinary approach interventions would be necessary for pwCFs in the early periods of a possible pandemic and lockdown. Also, psychosocial approaches for assessment and treatment would positively affect the QoL.

There are some limitations to our study. One of the limitations of the study is that, due to the pandemic conditions, the participants were reached through online surveys, and the participants could not explain the reasons behind their answers. In addition, it was difficult to make causal deduction because the information presented in the study and related analyzes were produced from a cross-sectional study. A final limitation was that the physical activity levels of the participants were not questioned and therefore the results obtained could not be correlated with the physical activity levels of the individuals

As a conclusion, an increase in fear of COVID-19 had a negative impact on anxiety, depression and QoL (general health status, physical health, psychological health, environment domains) in pwCFs according to our study findings. Deterioration in physical condition, change in routine, decrease in sleep quality, demoralized and discouraged feelings were reported more by the pwCFs compared to the GP controls. Cross-sectional studies should be conducted on a regular basis to monitor the psychosocial effects of PwCFs. As a result, it will be easier to identify the psychosocial changes that take place in scenarios involving a possible pandemic and a lockdown and to take the necessary action before it is too late.

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Declaration of Conflicting Interest

The authors declare no conflicts of interest.

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