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Fear of COVID-19: reflections on disease severity, sleep and anxiety in fibromyalgia patients

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ABSTRACT

Aim: This study aimed to assess the effects of COVID- 19 fear and anxiety on disease severity, pain, sleep quality and health-related quality of life in fibromyalgia patients.

Material and Method: Sixty-four patients with diagnosis fibromyalgia and sixty-five healthy volunteers over 18 years of age were enrolled in the study. Sociodemographic features were evaluated. Fibromyalgia Impact Questionnaire (FIQ), Short Form 36 (SF-36), Coronavirus Anxiety Scale (CAS), Obsession with COVID-19 Scale(OCS), and Pittsburgh Sleep Quality Index (PSQI) were administered to all participants.

Results: The mean values of CAS, FIQ, PSQI, and BDI were found to be higher in the fibromyalgia group than the control group ($p<0.05$). The median/mean value of CAS, OCS, and BDI were higher in patients with losing a first-degree relative patient due to COVID-19 in fibromyalgia group, these results were statistically significant ($p<0.05$).

Conclusion: According to the results of this study, fibromyalgia may be affected more by psychological stress which affects disease severity during COVID 19 pandemic.

Keywords: Fibromyalgia, COVID-19, anxiety

INTRODUCTION

COVID-19 disease was reported from Wuhan, China in December 2019 as viral pneumonia of unknown origin (1). On January 7, 2020 the new type of coronavirus SARS- CoV-2 was detected as the viral pneumonia agent. The disease has spread all over the world rapidly and the World Health Organization (WHO) defined disease as the novel coronavirus disease (COVID-19) and declared a pandemic (2). The prognosis of COVID 19 disease varies according to age, comorbidities and gender (3). The researches on the etiology, prognostic factors, prevention and treatment of COVID-19 disease continues (4).

Fibromyalgia is a chronic pain disease that includes the musculoskeletal system. The symptoms of fibromyalgia are generalized pain (head-to-toes), fatigue, morning stiffness not exceeding 60 minutes, regional pain syndromes such as migraine, dysmenorrhea, irritable bowel syndrome, autonomic disturbances as orthostatic hypotension, feeling of instability, xerostomia. Anxiety and stress are important factors for fibromyalgia severity and psychological mood problems are seen more frequently in fibromyalgia patients than healthy individuals. The prevalence of anxiety for fibromyalgia patients is 60 % and depression is 14-36% (5).

There are many studies in the literature evaluating fibromyalgia severity during the COVID-19 pandemic. We aimed to evaluate the effects of COVID-19 fear and anxiety on disease severity, pain, sleep quality and health related quality of life in fibromyalgia patients.

MATERIAL AND METHOD

Study Design and Setting

The study protocol was approved by the Kırklareli University Health Sciences Institute Ethics Committee (Date: 12.07.2021, Decision No: E-69456409-199-17531). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.The participants were informed about the aim of study before applying the study, all participants were asked whether they accepted to complete the study and thus all participants have declared voluntary for the study. The informed consent form was applied to all the participates.

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Participants

Sixty-four patients with diagnosis fibromyalgia and sixty-five healthy volunteers were participated to the study. The following inclusion criteria were applied: (a) having a diagnosis as primary fibromyalgia for more than 1 year according to the American College of Rheumatology criteria (b) being more than 18 years old age (c) being volunteer to participate study. The following exclusion criteria were applied (a) a diagnosis with skeletal muscle diseases, chronic renal diseases, chronic liver failure, malignancy and neurologic diseases; (b): having cognitive impairment that affects answering the questionnaires; (c): being pregnant.

Sociodemographic features including age, gender, body mass index, fibromyalgia duration, education level, having history of COVİD-19 disease in participants and loosing first degree relatives were analyzed. The Fibromyalgia İmpact Questionnaire (FIQ), Short Form 36 (SF36), Coronavirus Anxiety Scale (CAS), Obsession with COVID-19 Scale (OCS), and Pittsburgh Sleep Quality Index (PSQI) were administered to all participants.

Outcome Measures

The beck depression inventory (BDI): It is a scale developed by Beck A. using clinical observations in depressed psychiatric patients and rarely in non-depressed psychiatric patients (6). BDI assesses depression symptoms with 21 multiple choice items. Each item has a 4-point scale variable between 0 (absent) and 3 (severe). A minimum of 0 and a maximum of 63 points can be obtained from the scale The Turkish validity and reliability study of the questionnaire was carried out by Hisli (7).

Pittsburgh sleep quality index (PSQI): PSQI was developed and widely used by Buysse et al. In order to evaluate sleep quality in the last month, the questionnaire consisting of 24 questions includes 19 questions about sleep duration, duration of latency, and the frequency and severity of certain sleep-related problems. The last 5 questions are used for clinical purposes and are answered by the patient's bed or room partner. PSQI consists of 7 components and the score obtained from the components represents the total score. The total score is in the range of 0-21, and an increase in the score indicates poor sleep quality (8). The Turkish validity and reliability study of the scale was performed by Agargün et al. in 2004 (9).

The short form 36 (SF-36): Short Form 36 has eight parts that include general health (5 items), vitality (4 items), physical functioning (10 items), bodily pain (2 items), physical role functioning (4 items); emotional role functioning (3 items); mental health (5 items); and social functioning (2 items). The total score was obtained the combination of the eight sections. Higher scores are related to well quality of life. The SF-36 was adapted into Turkısh in1999 by Koçyigit H et al., and the study results suggest it is useful for clinical studies (10).

The fibromyalgia impact questionnaire (FIQ): FIQ has three parts including function, symptoms and overall impact. High scores indicate worse functionality and increased symptom severity and affects the person more The FIQ was adapted into Turkısh in 2000 by Sarmer S et al, and the study results suggests it is useful for clinical studies (11).

Coronavirus anxiety scale all questions (CAS): COVID-19 related anxiety (CAS) was developed by Lee. The questionnaire is a five-item mental health scale that assesses physiological effects as anxiety related to COVID-19. A cut-off point of ≥ 9 demonstrates the anxiety related to COVID-19 (12). The Turkısh validity and reliability studies was performed by Evren et al.(13).

Obsession with COVID-19 scale (OCS): Obsession with COVID-19 Scale (OCS) is a 4-item scale that helps to assess persistent and disturbing thinking about COVID-19 (14). OCS was found an effective and valid tool for clinical practice. OCS indicates dysfunctional thinking associated with a total score ≥7. The Turkısh validity and reliability studies was performed by Evren et al.(13).

Statistical Analysis

Mean±standard deviation and median (minimum–maximum) were used for continuous variables, whereas categorical data was reported with numbers and percentages. The Kolmogorov-Smirnov goodness-of-fit test was used to perform normality analyses in the cross-group analysis of continuous variables. Evaluation of the groups with the normal distribution of continuous variables was done by using the independent samples t-test. Cross-group comparisons of variables not eligible for normal distribution were analyzed with the Mann-Whitney U test. The chi-square test (Fisher's exact test when necessary) was used for the comparison of categorical data. The analyses were performed with the Statistical Package for the Social Sciences (SPSS) software program version 26.0 (IBM Corporation, Armonk, NY, USA). The statistical significance level was set at $p<0.05$.

RESULTS

A total of 129 participants were enrolled in the study. The participants were grouped into Group 1 (fibromyalgia, n=64) and Group 2 (control, n=65). The mean age, body mass index (BMI), the ratio of female gender, the ratio of educational status as primary school, the ratio of marital status, and usage of drugs (painkiller, antidepressant, and myorelaxant) were found to be statistically significantly higher in fibromyalgia group than control group ($p<0.05$).

However, there were no statistically significant differences between the two groups in terms of comorbidities, usage of anticonvulsant, history of COVID-19, hospitalization due to COVID-19 and losing a first-degree relative due to COVID-19 (p>0.05). Comparisons of the demographic and some clinical features of groups are presented in **Table 1**.

Table 1. Comparison of demographic and clinical features of participants between two groups

	Fibromyalgia (n=64)	Control (n=65)	p
Age (mean±SD)	41.46±9.42	27.33±5.17	<0.001*
BMI (kg/m²) (mean±SD)	26.38±4.41	23.23±3.88	<0.001*
Gender (n, %)			<0.001**a
Female	62 (96.9%)	48 (73.8%)	
Male	2 (3.1%)	17 (26.2%)	
Educational status (n, %)			<0.001**
Primary school dropout	8 (12.5%)	0 (0.0%)	
Primary school	29 (45.3%)	0 (0.0%)	
Secondary school	8 (12.5%)	0 (0.0%)	
High school	11 (17.2%)	3 (4.6%)	
University	8 (12.5%)	62 (95.4%)	
Marital status (n, %)			<0.001**
Single	7 (10.7%)	45 (69.2%)	
Married	55 (85.9%)	19 (29.2%)	
Divorced	0 (0.0%)	1 (1.5%)	
Widowed	2 (3.1%)	0 (0.0%)	
Comorbidities (n, %)			0.368**
No	64 (98.4%)	64 (98.5%)	
Yes (Hypothyroidism)	1 (1.6%)	0 (0.0%)	
Yes (others)	0 (0.0%)	1 (1.5%)	
Usage of painkiller (n, %)			<0.001**a
Yes	32 (50.0%)	0 (0.0%)	
No	32 (50.0%)	65 (100.0%)	
Usage of antidepressant drugs (n, %)			<0.001**a
Yes	14 (21.9%)	0 (0.0%)	
No	50 (78.1%)	65 (100.0%)	
Usage of myelorelaxant drugs (n, %)			<0.001**a
Yes	14 (23.4%)	0 (0.0%)	
No	49 (76.6%)	65 (100.0%)	
Usage of anticonvulsant drugs (n, %)			0.244**a
Yes	2 (3.1%)	0 (0.0%)	
No	62 (96.9%)	65 (100.0%)	
History of COVID-19 (n, %)			0.666**
Yes	25 (39.1%)	23 (35.4%)	
No	39 (60.9%)	42 (64.6%)	
Hospitalization due to COVID-19 (n, %)			0.244**a
Yes	2 (3.1%)	0 (0.0%)	
No	62 (96.9%)	65 (100.0%)	
History of COVID-19 in a first-degree relative (n, %)			0.650**
Yes	37 (57.8%)	35 (53.8%)	
No	27 (42.2%)	30 (46.2%)	
Losing a first-degree relative due to COVID-19 (n, %)			0.203**a
Yes	6 (9.4%)	12 (18.5%)	
No	58 (90.6%)	53 (81.5%)	
Total	64 (100.0%)	65 (100.0%)	

* Independent Samples T Test, ** Mann Whitney U Test, *** Chi-square Test (aFisher's exact test)

The mean values of CAS, FIQ, PSQI and BDI were found to be higher in the fibromyalgia group than the control group (p=0.044, p<0.001, p=0.009 and p<0.001 respectively). Also, the mean values of subscales of SF-36 as physical function, pain, physical role functioning, general health, social functioning, and vitality were found to be lower in the fibromyalgia group than the control group (p<0.001, p<0.001 p=0.004, p<0.001, p<0.001, p=0.015 respectively). However, the mean values of OCS, emotional role functioning and mental health were found lower in the fibromyalgia group but the differences were not statistically significant (p>0.05). Comparisons of the outcomes scores among the groups is shown in **Table 2**.

Table 2. Comparison of results of Fibromyalgia Impact Questionnaire, Pittsburgh Sleep Quality Index, sub scales of Short Form 36 , Obsession with COVID-19 Scale, Coronavirus Anxiety Scale and Beck Depression Inventory between groups

	Fibromyalgia (n=64)	Control (n=65)	p
CAS	1.05±2.32	0.36±1.35	0.044*
OCS	2.57±3.24	2.35±2.58	0.664*
FIQ	50.0 (3.6-94.4)	27.4 (0-80.9)	<0.001**
PSQI	10.0 (0-17.0)	6 (1-16)	0.009**
BDI	16 (0-45)	12 (0-36)	<0.001**
Physical Function	65 (0-100.0)	95 (40-100.0)	<0.001**
Pain	32.0 (0-90.0)	62.0 (22-100.0)	<0.001**
Physical Role Functioning	25.0 (0-100.0)	75.0 (0-100.0)	0.004**
General Health	43.5 (5-97.0)	62.0 (15-100.0)	<0.001**
Social Functioning	62.5 (0-100.0)	75.0 (12.5-100.0)	<0.001**
Vitality	45.0 (0-90.0)	50.0 (5-100.0)	0.015**
Emotional Role Functioning	50.0 (0-100.0)	66.6 (0-100.0)	0.173**
Mental Health	64.0 (8-92.0)	68.0 (20-100.0)	0.162**

* Independent Samples T Test, ** Mann Whitney U Test, CAS, Coronavirus Anxiety Scale; OCS, Obsession with COVID-19 Scale; FIQ,Fibromyalgia Impact Questionnaire; PSQI, Pittsburgh Sleep Quality Index; BDI, Beck Depression Inventory

The mean value of CAS was found to be statistically significantly higher in patients with COVID-19 history (2.00±3.27) than patients without COVID-19 history (0.43±1.07) in fibromyalgia group (p=0.007). However, there were no statistically significant differences of the mean values of OCS, BDI, FIQ, PSQI and the subscales of SF-36 according to having COVID-19 history in fibromyalgia group (p>0.05) (**Table 3**).

When the history of losing a first-degree relative due to COVID-19 was compared in fibromyalgia group, the median/mean value of CAS, OCS, and BDI were higher in patients with losing first-degree relative and the differences were statistically significant (p=0.029, p<0.001 and p=0.005, respectively). Also, the mean values of physical role functioning, social functioning

and mental health were lower in patients with losing a first degree relative and the differences were statistically significant (p=0.011, p=0.007, p=0.033 and p=0.002, respectively). But there were no statistically significant differences according to FIQ and PSQI scores (p=0.336 and p=0.175 respectively) (**Table 4**).

Table 3. Comparison of results of Fibromyalgia Impact Questionnaire, Pittsburgh Sleep Quality Index, sub scales of Short Form 36 , Obsession with COVID-19 Scale, Coronavirus Anxiety Scale and Beck Depression Inventory in fibromyalgia group in terms of COVID-19 history

	History of COVID-19 (n=25)	No History of COVID-19 (n=39)	p
CAS	2.00±3.27	0.43±1.07	0.007*
OCS	3.00±3.31	2.30±3.20	0.409*
FIQ	54.7 (9.7-81.7)	47.1 (3.6-81.7)	0.175**
PSQI	10.0 (1-17.0)	8 (0-17)	0.317**
BDI	19 (0-45)	15 (0-35)	0.158**
Physical Function	65 (25.0-90.0)	65 (0-100.0)	0.392**
Pain	31.0 (0-90.0)	32.0 (0-90.0)	0.502**
Physical Role Functioning	25.0 (0-100.0)	50.0 (0-100.0)	0.655**
General Health	35.0 (5-82.0)	45.0 (5-97.0)	0.544**
Social Functioning	62.5 (0-100.0)	62.5 (0-100.0)	0.801**
Vitality	35.0 (0-90.0)	50.0 (5-100.0)	0.310**
Emotional Role Functioning	66.6 (0-100.0)	66.6 (0-100.0)	0.625**
Mental Health	64.0 (8-84.0)	68.0 (8-92.0)	0.384**

* Independent Samples T Test, ** Mann Whitney U Test, CAS, Coronavirus Anxiety Scale; OCS, Obsession with COVID-19 Scale; FIQ,Fibromyalgia Impact Questionnaire; PSQI, Pittsburgh Sleep Quality Index; BDI, Beck Depression Inventory

Table 4. Comparison of results of Fibromyalgia Impact Questionnaire, Pittsburgh Sleep Quality Index, sub scales of Short Form 36 , Obsession with COVID-19 Scale, Coronavirus Anxiety Scale and Beck Depression Inventory in fibromyalgia group in terms of History of COVID-19 in a first-degree relative

	Loosing first degree relative due to COVID-19 (n=6)	No Loosing first degree relative due to COVID-19 (n=58)	p
CAS	3.00±3.46	0.84±2.10	0.029*
OCS	6.83±3.81	2.13±2.86	<0.001*
FIQ	54.9 (45.1-57.1)	49.5 (3.6-94.4)	0.336**
PSQI	11.0 (10.0-15.0)	8 (0-17)	0.175**
BDI	27 (17-36)	15.5 (0-45)	0.005**
Physical Function	60 (0-75.0)	65 (20.0-100.0)	0.252**
Pain	25.5 (0-41.0)	32.0 (0-90.0)	0.198**
Physical Role Functioning	0.0 (0-25.0)	50.0 (0-100.0)	0.011**
General Health	38.5 (5-67.0)	43.5 (5-97.0)	0.506**
Social Functioning	25.0 (0-62.5)	62.5 (0-100.0)	0.007**
Vitality	30.0 (0-45.0)	45.0 (0-90.0)	0.033**
Emotional Role Functioning	16.6 (0-66.6)	66.6 (0-100.0)	0.242**
Mental Health	34.0 (8-52.0)	68.0 (8-92.0)	0.002**

* Independent Samples T Test, ** Mann Whitney U Test, CAS, Coronavirus Anxiety Scale; OCS, Obsession with COVID-19 Scale; FIQ,Fibromyalgia Impact Questionnaire; PSQI, Pittsburgh Sleep Quality Index; BDI, Beck Depression Inventory

DISCUSSION

The presence of COVID-19 fear and the relationship with disease severity in fibromyalgia patients were evaluated in this study. The psychological effects as anxiety and COVID-19 fear were higher in fibromyalgia patients than healthy participants. The study revealed that the fibromyalgia patients with history of COVID-19 disease had more COVID-19 fear and losing first degree relative due to COVID-19 may improve COVID-19 fear, depression symptoms, fibromyalgia disease severity, sleep problems and effect the health related quality of life in fibromyalgia patients.

Fibromyalgia is defined as a syndrome characterized by chronic and widespread musculoskeletal pain. Insomnia, fatigue, mood disorders, anxiety, depression are the common symptoms (15). The pathophysiological factors of fibromyalgia are not known exactly. Most fibromyalgia patients are hypersensitive to have pain and psychologic factors may be associated occurrence of the pain (16). Epstein et al. (17) have been showed the prevalence of psychological comorbidities as anxiety disorders or depression are 60% in fibromyalgia patients. Also depressive patterns are associated with worse prognosis so that greater pain severity was observed in fibromyalgia patients with comorbidity of depression symptoms than healthy groups (18) .

COVID-19 disease as well as the various restrictions taken by the states to prevent the spread of the disease, have also affected the recovery process of patients, especially their mental and physical functions (19). Studies have reported individualis'loneliness level had increased during the pandemic due to lack of social interactions. Increased of individualis'loneliness has been associated with anxiety and depression. (20) During COVID-19 pandemic many assessment tools have been used to evaluate psychological effects of COVID-19. In this current study CAS and OCS were used and the fibromyalgia patients with history of COVID-19 had higher scores demonstrates anxiety associated with coronavirus and thinking about COVID-19 too much. As we know the severity of fibromyalgia symptoms such as higher perception of tenderness after pressure is applied to tender points have been increased with anxiety (21). Batres-Marroquín et al. (22) reported that the fibromyalgia symptoms as pain, anxiety and depression have been worsening COVID-19 pandemic lockdown. Also increased sympathetic nervous system activity play a role on sleeping problems and COVID-19 lockdown- associated life style changes could worsen sympathetic nervous system. Previous studies showed that fibromyalgia patients have norepinephrine-evoked pain (23) .

The relationship between sleep disorders and fibromyalgia is known. It has been shown in recent studies to be associated with sleep disturbance and widespread musculoskeletal pain. The effect of insomnia on pain formation and pain persistence is reported (24,25). The relationship between COVID-19 disease and sleep disturbances is known. Sleep duration and timing in COVID-19 positive individuals were affected by the illness behavior of sleep pattern at 30 days post-illness (26). It was not surprising that PSQI scores were higher in the fibromyalgia group in this study. However, sleep scores were found to be high in fibromyalgia patients with COVID-19 history. This suggests that COVID-19 may be an effect on sleep disorders in fibromyalgia patients.

Dell'Osso et al. (27) showed that loss events and the severity of illness and health related quality of life in fibromyalgia patients. Similarly, in this current study the patients with losing first degree relatives due to COVID-19 had higher CAS, and OCS scores besides disease severity and low health related quality of life scores. Death and mourning process are universal and refers to losses that can occur at any stage of life. The grieving process reflects affective, cognitive, behavioral, physiological responses which affect individual and family system (28). Losing first degree relative and mourning process have difficulties to accept and adapt for most people. During pandemic period the restrictions, lack of social relations and legal limits on the number of people who can attend funeral could be increase these difficulties of mourning process. The main limitation of this study is its relatively small sample size and a single center study.

CONCLUSION

Psychological disorders are related with fibromyalgia severity and symptoms of disease. Fibromyalgia patients may be more effected in accordance of cognitive, mental and psychological features. These patients should be evaluated closely and treatment of fibromyalgia patients assessed. With the completion of researches on the long-term effects of COVID-19, the effects of COVID-19 disease will be better understood and the management of fibromyalgia will be reviewed.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Kırklareli University Health Sciences Institute Ethics Committee (Date: 12.07.2021, Decision No: E-69456409-199-17531).

Informed Consent: Written informed consent was obtained from all participants who participated in this study.

Referee Evaluation Process: Externally peer-reviewed.

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

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

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