Determination of Health Anxiety and Resilience Levels in Patients with Fibromyalgia Syndrome and Rheumatoid Arthritis During SARS-CoV-2 Pandemic: A Case–Control Study

ABSTRACT

Background: Fibromyalgia Syndrome and Rheumatoid Arthritis are chronic diseases associated with pain. These diseases reduce the patient's quality of life and cause psychological problems. The study aimed to determine health anxiety and resilience levels in patients with fibromyalgia syndrome and rheumatoid arthritis during the severe acute respiratory syndrome coronavirus 2 pandemic.

Methods: This case–control study conducted in Central Anatolia Region, Turkey, included 180 participants (60 patients with fibromyalgia syndrome, 60 patients with rheumatoid arthritis, and 60 healthy subjects). Data were collected using the Brief Resilience Scale and Health Anxiety Scale. Pain intensity was assessed using the Visual Analog Scale.

Results: Resilience was significantly higher in healthy controls than in the fibromyalgia syndrome and rheumatoid arthritis groups ($P < .001$). Resilience was also higher in the rheumatoid arthritis group than fibromyalgia syndrome ($P < .001$) group. Hypersensitivity to somatic symptoms and anxiety, negative results of diseases, and total scores of Health Anxiety Scale were significantly higher in the fibromyalgia syndrome and rheumatoid arthritis groups than healthy controls ($P < .001$). Also, Health Anxiety Scale scores in the fibromyalgia syndrome group were higher than the rheumatoid arthritis group ($P < .001$). There was a very strong and negative correlation between the participants' resilience and health anxiety levels ($r = -0.818$, $P < .001$). The most important predictors of resilience were hypersensitivity to somatic symptoms and anxiety ($r = -0.335$, $P < .001$), the group ($r = 0.302$, $P = .003$), the pain intensity ($r = -0.169$, $P = .043$), and the negative consequences of the disease ($r = -.149$, $P = .038$). The hypersensitivity to somatic symptoms and anxiety, the Visual Analog Scale, and the negative consequences of the disease were negatively correlated with resilience. But there was a positive correlation between fibromyalgia syndrome and rheumatoid arthritis groups and resilience.

Conclusions: Patients with fibromyalgia syndrome and rheumatoid arthritis have low resilience and high health anxiety. The interventions should be planned to increase resilience and decrease the health anxiety of patients with fibromyalgia syndrome and rheumatoid arthritis.

Keywords: Fibromyalgia, rheumatoid arthritis, health anxiety, resilience

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Introduction

Health anxiety (HA) is an obsessive and irrational worry about having a severe medical condition that causes suffering and substantial functional impairment.[1] Health anxiety is characterized by excessive health concerns and fear of contracting a disease. Health anxiety is associated with chronic illness, and people with chronic illness often report feeling anxious and worried about their condition or its symptoms recurring or worsening.[2] Patients with chronic pain have high HA levels.[3] The incidence of HA in chronic pain is estimated as 51% and is associated with disability and maladaptive pain behaviors.[4]

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Chronic pain is one of the most prominent symptoms in diseases such as rheumatoid arthritis (RA) and fibromyalgia syndrome (FMS). Rheumatoid arthritis is a long-term autoimmune disorder that mainly affects the joints. It typically causes hot, swollen, and painful joints.[1] Patients describe the severity, quality, and periodicity of their joint pain in different ways. It is often described as "gnawing" or aching, suggesting nociceptive mechanisms directly mediated by inflammation or joint damage.[5] Fibromyalgia syndrome is a syndrome characterized by chronic musculoskeletal pain. The diagnosis of FM includes chronic generalized pain that lasts for at least 3 months, characterized by pain on palpation in at least 11 of 18 specific body sites.[6] The pain characteristics in both diseases can influence the disease process, treatment, and disease-related factors.

Health anxiety is believed to be high in RA and FMS patients as the pain severity is high in these patients. Resilience is an essential coping method in dealing with pain and HA. Resilience is a set of adaptive responses to pain and pain-related life adversities. It plays a vital role in defining the relationship between pain and maladaptive pain coping strategies.[7] Resilience also emerged as a personal resource that increases the patients' capacity to manage pain effectively.[8] Resilient patients with chronic pain have high coping and quality-of-life scores.[9]

Fibromyalgia syndrome and RA are chronic diseases associated with pain. These diseases reduce the patient's quality of life and cause psychological problems. We do not know whether disease prognosis affects both groups' resilience and HA and whether there is a difference. There is no study on this. We also do not know the extent of the relationship between resilience and HA. We presumed that patients with FMS and RA would be more likely to have lower resilience and higher HA than healthy subjects. Therefore, the present study compared patients with FMS and RA and healthy subjects in terms of HA and resilience during the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic.

Methods

Study Design and Sampling
This study included 180 participants in Aksaray University Training and Research Hospital Physical Therapy and Rehabilitation Outpatient Clinic between September 2020 and January 2021. Sixty FMS, 60 RA, and 60 healthy controls participated in the study with a convenience sampling method. The first author is a medical doctor in physical treatment and rehabilitation. He examined and diagnosed patients who applied to the physical medicine and rehabilitation outpatients clinic of Aksaray University Training and Research Hospital between

September 2020 and January 2021. Other patients who were not diagnosed with fibromyalgia or RA and agreed to participate in the study were included in the control group. Data were collected from patients in the clinic during the examination. The data collection took approximately 15-20 minutes.

The study sample was defined as 180, with the sample size calculated with a 5% error margin at a 95% CI. Sixty patients were included in each group. A convenience sampling method was used for patient selection. Patients who met the inclusion criteria were included in the study. Inclusion criteria were as follows: (a) 18 years old and more, (b) literate, (c) a native Turkish, and (d) no communication difficulties. American College of Rheumatology (ACR) 2013 criteria were used for FMS. ACR/European League against Rheumatism (EULAR RA) 2010 classification criteria were used for RA.

Data Collection Tools
Sociodemographic Information Form (SIF), Brief Resilience Scale (BRS), and Health Anxiety Scale (HAS) were used to collect data. Pain intensity was evaluated with the Visual Analog Scale (VAS).

The researchers prepared the SIF, which consisted of questions about the sociodemographic characteristics of the patients, such as age, gender, educational status, economic status, family structure, and pain-related characteristics.

The BRS is used to measure the level of individual resilience.[10] The scale consists of 6 items. It is a 5-point Likert-type, self-reporting measurement tool (1, not suitable at all; 2, not suitable; 3, somewhat appropriate; 4, completely suitable; 5, completely suitable). Items scored in reverse are items 2, 4, and 6. Reverse items are as follows: "I have difficulty coping with stressful events," or "When something bad happens, it's hard for me to get over it," or "It takes a long time to recover from the negative events in my life." The highest score on the scale is 30, and the lowest is 6. High scores indicate a high level of psychological resilience. The Cronbach's alpha coefficient of the scale was 0.83 in the Turkish validity and reliability study.[11] The Cronbach's alpha coefficient of the scale was 0.95 in this study.

The HAS is an 18-item 3-point Likert-type scale. Scoring is between 0 and 3 for each item. The scores range from 0 to 54. A high score indicates a high HA level.[12] The HAS consists of 2 sub-dimensions: hypersensitivity to somatic symptoms and anxiety and negative results of diseases. The Cronbach's alpha coefficient of the scale was 0.92 in the Turkish validity and reliability study.[13] The Cronbach's alpha coefficient was 0.95 for hypersensitivity to somatic symptoms and anxiety and 0.76 for negative results of diseases in this study.

The VAS is widely accepted as the gold standard in pain assessment. It consists of a 10-cm vertical line. The bottom line labeled as "0" defines that the individual has "no pain." The upper point of the line labeled as "10" describes the "worst pain imaginable." The patients marked their pain intensity on VAS.

Data Analysis
Statistical Package for the Social Sciences (SPSS) version 24.0 (IBM SPSS Corp.; Armonk, NY, USA) was used to evaluate the data. Descriptive statistics were presented as median (minimum-maximum) for non-normally distributed variables and as mean and standard deviation for the normally distributed variables.

MAIN POINTS
- *Fibromyalgia syndrome and rheumatoid arthritis patients during the severe acute respiratory syndrome coronavirus 2 pandemic had low resilience scores and high health anxiety scores.*
- *High resilience levels of patients with fibromyalgia syndrome and rheumatoid arthritis are associated with low health anxiety levels.*
- *The predictors of resilience in patients with fibromyalgia syndrome and rheumatoid arthritis are hypersensitivity to somatic symptoms and anxiety, pain intensity, and negative consequences of the disease.*

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Categorical variables were reported as frequencies and percentages. Kolmogorov–Smirnov test was used to investigate the conformity of the data for normal distribution. Spearman's correlation coefficient was used to evaluate the bivariate associations between resilience and HA. Pearson's chi-square test was used to compare categorical variables (e.g., gender, marital status) between the 3 groups. Mann–Whitney U test and Kruskal–Wallis test compared non-normally distributed continuous variables (e.g., resilience, HA, pain duration, disease duration, pain intensity) between groups. If a significant difference was detected by Kruskal–Wallis test, the Mann–Whitney U test was used to determine the groups between which the difference was significant. The results obtained after pairwise comparisons with the Mann–Whitney U test were compared with the alpha obtained after Bonferroni correction ($a* = a/k$, k = number of comparisons). Multiple linear regression analyses were used to assess the impact of sociodemographic and pain-related variables and the HAS on BRS. Age, gender, disease duration, pain duration, and HA did not predict resilience in Model 1. Therefore, we removed non-significant variables in Model 1. We included other variables in Model 2 and wanted to see how well they predicted resilience. $P < .05$ level was considered statistically significant.

Ethical Approval

Written permissions were obtained from Aksaray University Training and Research Hospital and Aksaray University Ethics Committee (date: August 31, 2020; No. 2020/08-25). Patients participating in the study were informed about the research, and it was explained that individual information would be kept confidential.

Results

The average age was 33.93 (7.49) years for FMS patients, 49.50 (11.59) years for RA patients, and 36.33 (10.31) years for healthy individuals. Table 1 shows the demographic and clinical characteristics of participants. All 3 groups were found similar with respect to gender ($P = .198$) and family structure ($P = .100$). However, they differed in terms of age ($P < .001$), marital status ($P = .025$), educational status ($P < .001$), and economic status ($P = .011$). Fibromyalgia syndrome patient groups had higher use of psychiatric drugs ($P < .001$), and their physical and mental health was more affected by the coronavirus disease 2019 outbreak ($P < 0.001$). The mean disease and pain duration of the patients with RA were higher than that of the patients with FMS. The pain severity of patients with FMS was higher than those with RA as per the VAS evaluation. Pain areas of both groups varied ($P < .001$).

Group comparisons of BRS and HAS scores are shown in Table 2. The BRS mean scores between the groups showed a statistically significant difference ($P < .001$). There was a statistically significant difference between the group's total and subscale mean HAS scores ($P < .001$). Resilience was significantly higher in healthy controls than in the FMS and RA groups ($P < .001$). Resilience was also higher in the RA group than FMS ($P < .001$). Hypersensitivity to somatic symptoms and anxiety, negative results of diseases, and total scores of HAS were significantly higher in the FMS and RA groups than healthy controls ($P < .001$). Also, HAS scores in the FMS group were higher than those of RA group ($P < .001$).

There was a very strong and negative correlation ($r = -0.818$, $P < .001$) between the patients' BRS and total HAS mean scores

(Table 3). There was a statistically significant relationship between BRS and hypersensitivity to somatic symptoms and anxiety ($r = -0.817$, $P < .001$) and negative results of diseases ($r = -0.650$, $P < .001$).

According to Model 1 (Table 4), the most important predictors of BRS were hypersensitivity to somatic symptoms and anxiety ($\beta = -0.335$, $P < .001$). This was followed by the group ($\beta = 0.302$, $P = .003$), the VAS ($\beta = -0.169$, $P = .043$), and the negative consequences of the disease ($\beta = -0.149$, $P = .038$). According to Model 2, the 2 most important predictors of BRS were hypersensitivity to somatic symptoms and anxiety ($\beta = -0.370$, $P < .001$) and group ($\beta = -0.302$, $P < .001$). Group, age, gender, disease duration, pain duration, pain intensity, hypersensitivity to somatic symptoms and anxiety, and negative results of diseases in Model 1 explained 68% of the resilience ($R^2 = 0.680$, $P < .001$). Group, pain intensity, hypersensitivity to somatic symptoms and anxiety, and negative results of diseases in Model 2 explained 67% of the resilience ($R^2 = 0.672$, $P < .001$). Age, gender, disease duration, and pain duration explained only 1% of the resilience. According to the regression analysis, type of disease (group), pain intensity, and HA were the most important predictors of resilience.

Discussion

When the scale score averages of the groups were compared during the SARS-CoV-2 pandemic, the patients with FMS had the lowest resilience level and the highest HA level. Moreover, patients with FMS reported that their physical and mental health was affected by the SARS-CoV-2 pandemic. The pain intensity of patients with FMS was higher than that of patients with RA. The symptoms of patients with FMS were worsened during the SARS-CoV-2 pandemic because of the increase in physical, mental, emotional, and economic stressors.[14] The patients experienced severe anxiety about accessing health care services and being infected with SARS-CoV-2, and the increase in pain caused an increase in anxiety level.[15] In a study, when the pain and FMS symptoms increased, functionality was impaired, and 50% of the patients experienced anxiety problems during the SARS-CoV-2.[16] In another study, the level of coronaphobia and psychological and psychosomatic effects were higher in the group with FMS as compared to the control group.[17] Since resilience means that the patients can manage their pain and cope with it, patients with FMS cannot cope with the pain and pain negatively affects their anxiety levels.[8]

Patients with RA had lower resilience and higher HA than healthy individuals. Even if they were in a better condition than patients with FMS, they were at risk of physical and psychological well-being. During the SARS-CoV-2 pandemic, patients with RA were more fragile and more susceptible to infection than the general population due to their impaired immune systems, and they used immunosuppressive drugs.[18] This can affect their anxiety levels. In studies conducted during the pandemic, the anxiety levels of patients with RA were high.[19,20] Rheumatoid arthritis is a chronic disease. Inability to access treatment, lack of information, and comorbidities such as hypertension and asthma can impair mental health in patients with RA during the SARS-CoV-2 pandemic.[21,22]

As the resilience levels of the participants increased, their HA decreased. No other study in the literature investigated the relationship between HA and resilience in patients with FMS and RA. However, studies conducted with different patient groups showed a significant and negative relationship between resilience and

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Table 1. Demographic and Clinical Characteristics of Participants (n = 180)

Variable	FMS (n = 60) n (%)	RA (n = 60) n (%)	Control (n = 60) n (%)	P
Age mean (SD)	33.93 (7.49)	49.50 (11.59)	36.33 (10.31)	
20-33	30 (50.0)	6 (10.0)	27 (35.0)	<.001
34-47	26 (43.3)	16 (26.7)	23 (36.1)	
≥48	4 (6.7)	38 (63.3)	10 (28.9)	
Gender				
Female	40 (66.7)	46 (76.7)	37 (61.7)	.198
Male	20 (33.3)	14 (23.3)	23 (38.3)	
Marital status				
Married	42 (70.0)	53 (88.3)	42 (70.0)	.025
Single	18 (30.0)	7 (11.7)	18 (30.0)	
Educational status				
Primary school	9 (15.0)	30 (50.0)	9 (15.0)	<.001
Secondary school	6 (10.0)	9 (15.0)	2 (3.3)	
High school	23 (38.3)	14 (23.3)	21 (35.0)	
University	22 (36.7)	7 (11.7)	28 (46.7)	
Socioeconomic status				
High	15 (25.0)	19 (31.7)	19 (31.7)	.011
Moderate	45 (75.0)	34 (56.6)	35 (58.3)	
Low	-	7 (11.7)	6 (10.0)	
Family structure				
Nuclear	43 (71.7)	44 (73.3)	52 (86.7)	.100
Extended	17 (28.3)	16 (26.7)	8 (13.3)	
Psychiatric medication				
Yes	18 (30.0)	5 (8.3)	-	<.001
No	42 (70.0)	55 (91.7)	60 (100.0)	
Effect of the COVID-19 on mental health				
No	1 (1.7)	41 (68.3)	39 (65.0)	<.001
Yes	59 (98.3)	19 (31.7)	21 (35.0)	
Effect of the COVID-19 on physical health				
No	13 (21.7)	44 (73.3)	54 (90.0)	<.001
Yes	47 (78.3)	16 (26.7)	6 (10.0)	
Body mass index				
≤18.49	-	-	7 (11.7)	<.001
18.50-24.99	31 (51.7)	20 (33.3)	28 (46.7)	
25.00-29.99	27 (45.0)	25 (41.7)	23 (38.3)	
≥30	2 (3.3)	15 (25.0)	2 (3.3)	
Pain location				
Head-neck	56 (93.3)	16 (26.7)	-	<.001
Back-waist	56 (93.3)	23 (38.3)	-	<.001
Arm-shoulder	43 (71.7)	49 (81.7)	-	.195
Leg-knee	13 (21.7)	35 (58.3)	-	<.001
Disease duration mean (SD)	3.68 (2.15)	10.08 (7.24)	-	<.001
Pain duration mean (SD)	3.66 (2.14)	10.06 (7.25)	-	<.001
VAS mean (SD)	8.68 (1.18)	5.65 (1.83)	-	<.001

BMI, body mass index; COVID-19, coronavirus disease 2019; SD, standard deviation; FMS, fibromyalgia syndrome; RA, rheumatoid arthritis; VAS, Visual Analog Scale.

anxiety.[23-25] The studies during the SARS-CoV-2 pandemic defined the relationship between resilience and anxiety.[26,27] Resilience was a protective factor for mental illnesses such as anxiety and depression.[27] Therefore, building resilience will be an important initiative to reduce or manage patients' HA.

Patients' HA levels, groups, and pain intensity were the most important predictors of their resilience in this study. Resilience facilitated the acceptance of pain and improved positive effects in patients with chronic pain.[28] Higher resilience of individuals with chronic pain was associated with less pain-related disability, lower pain intensity, higher pain self-efficacy, functionality, and better pain coping.[29,30] Another study reported that high pain-specific resilience was associated with

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Table 2. Group Comparison of BRS and HAS Scores

Scales	Fibromyalgia Syndrome (1) Median (Min-Max)	Rheumatoid Arthritis (2) Median (Min-Max)	Healthy Controls (3) Median (Min-Max)	P	Post Hoc Analysis Comparisons (a^*)
BRS	12 (6-19)	20 (6-29)	24 (16-30)	<.001	1-2, 1-3, 2-3
HAS	31.5 (8-44)	17 (5-45)	6.5 (1-22)	<.001	1-2, 1-3, 2-3
Hypersensitivity to somatic symptoms and anxiety	25 (5-36)	13 (4-35)	5 (1-18)	<.001	1-2, 1-3, 2-3
Negative results of diseases	6 (3-10)	4 (0-11)	2 (0-6)	<.001	1-2, 1-3, 2-3

It is considered as "($a^* = 0.017$) for pairwise comparisons."
BRS, Brief Resilience Scale; HAS, Health Anxiety Scale.

Table 3. Correlation Between the BRS and HAS Scores

			1	2	3	4
1.	BRS		1			
2.	HAS	r	-0.818	1		
		P	<.001			
3.	Hypersensitivity to somatic symptoms and anxiety	r	-0.817	0.987	1	
		P	<.001	<.001		
4.	Negative results of diseases	R	-0.650	0.810	0.715	1
		P	<.001	<.001	<.001	

BRS, Brief Resilience Scale; HAS, Health Anxiety Scale.

Table 4. Predictors of the BRS According to Regression Analysis

	Independent Variable	Standardized Coefficient β	P
Model 1	Group (Ref.: control)	0.302	.003
	Age	-0.041	.608
	Gender (Ref: male)	-0.075	.182
	Disease duration	2.063	.441
	Pain duration	-2.014	.452
	VAS	-0.169	.043
	Hypersensitivity to somatic symptoms and anxiety	-0.335	<.001
	Negative results of diseases	-0.149	.038
Model 2	Group (Ref. Control)	0.302	<.001
	VAS	-0.158	.050
	Hypersensitivity to somatic symptoms and anxiety	-0.370	<.001
	Negative results of diseases	-0.131	.055

Model 1: Adjusted $R^2 = 0.680$, $P < .001$; Model 2: Adjusted $R^2 = 0.672$; $P < .001$.
BRS, Brief Resilience Scale; VAS, Visual Analog Scale.

lower pain barrier and pain destruction, better distraction, higher pain coping, and pain tolerance.[31] In a study conducted with healthy adults, resilience reduced the effect of pain.[32] Therefore, there is a relationship between resilience and pain intensity, and resilience is an important factor in coping with pain intensity.

The groups predicted resilience. One of the most critical symptoms of FMS and RA is chronic pain. Chronic pain seriously impairs the functionality of the patients. The low resilience of FMS and RA patients makes it difficult to cope with pain. Resilience was an adaptation in the face of adversity, pain, trauma, stress, and so on.[33] It also could maintain the best level of emotional, psychological, and social well-being in the presence of pain.[34] Since psychiatric diseases were common in patients with FMS, their resilience level was low.[35] As a matter of fact, suicidal tendencies were associated with low resilience in these patients.[36] Patients with RA had shown low resilience, and it

impaired their quality of life.[37,38] Therefore, resilience is low in groups, leading to adverse health consequences.

In addition, there were differences between the groups in terms of some demographic and clinical characteristics such as age, marital status, educational status, socioeconomic status, and psychiatric medication. These characteristics can affect patients' resilience levels. High resilience was more prevalent in the younger age group and participants with higher education levels.[39] Older patients with autoimmune rheumatic diseases had higher resilience, and there was no influence of disease activity on resilience.[37] Income status, marital status, and chronic disease were significant predictors of participants' resilience.[40] The studies had different findings. The present study found that age, disease duration, and pain duration were not significant predictors of resilience. Therefore, more work should be done on the subject.

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This study had some limitations. Primarily, it was carried out in one center. Therefore, the results cannot be generalized. Another limitation was related to the method of study. The groups could not be matched in terms of sociodemographic variables. Finally, the data collection was based on patient reporting. The objective response of the patients could not be evaluated. Nonetheless, this study provided important information on 2 common diseases with chronic pain in terms of their association with resilience and HA.

Conclusion

Patients with FMS and RA had lower resilience and higher HA than healthy individuals. There was also a significant relationship between resilience and HA. Health anxiety and pain severity were the most important predictors of resilience. In line with these results, strengthening the resilience levels of both FMS and RA patients and reducing their HA levels are suggested.

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