The Relationship Between Disease Severity and Body Perception, Mood Disorder and Quality of Life in Fibromyalgia Syndrome

Fibromiyalji Sendromunda Hastalık Şiddeti ile Beden Algısı, Duygudurum Bozukluğu ve Yaşam Kalitesi Arasındaki İlişki

Ejder BERK[a], Burhan Fatih KOÇYİĞİT[a], Şule Şirin BERK[b]

aKahramanmaraş Sütçü İmam University Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Kahramanmaraş, TURKEY
bNecip Fazıl City Hospital, Department of Psychiatry, Kahramanmaraş, TURKEY

ABSTRACT Objective: The present study aimed to determine the correlation between fibromyalgia (FM) severity and body image perception and to investigate its impact on quality of life and mood. **Material and Methods:** The study participants included 18-65 years old 141 female FM patients and 30 healthy female subjects. Fibromyalgia impact questionnaire (FIQ), body image questionnaire (BIQ), Beck depression inventory (BDI), Beck anxiety inventory (BAI), and quality of life survey-short form (SF-36) were applied to all subjects. In order to define the severity of FM, cases were compared based on total FIQ scores and categorized as mild (<39), moderate (40-59), severe (≥60) and control groups. **Results:** There were statistically significant positive correlations between FM severity and BIQ, BDI, BAI scores, and statistically significant negative correlations between FM severity and physical functioning, role-physical, pain, general health, vitality, role- emotional and mental health scores. Multivariate regression analysis demonstrated that BIQ, role-physical, pain, general health and BDI values significantly contributed to fibromyalgia severity. **Conclusion:** The results of our study show that body image, mood and quality of life are affected negatively in FM patients and FM severity has an important effect on anxiety, depression, body image and quality of life.

Keywords: Fibromyalgia severity; body image perception; depression; anxiety; quality of life

ÖZET Amaç: Fibromiyalji (FM) hastalık şiddetinin vücut imajı algısı ile ilişkisini belirlemek ve aynı zamanda yaşam kalitesi ve duygu durumunun nasıl etkilendiğini araştırmaktır. **Gereç ve Yöntemler:** Çalışmaya 18-65 yaş aralığında 141 FM'li kadın hasta ve 30 sağlıklı kadın katılımcı dahil edildi. Tüm olgulara fibromiyalji etki anketi (FIQ), vücut algısı anketi (BIQ), Beck depresyon (BDI), Beck anksiyete (BAI), kısa form yaşam kalitesi (SF-36) anketleri uygulandı. FM hastalık şiddetini tanımlamak için olgular FIQ total skorlarına göre; hafif (<39), orta (40-59), şiddetli (≥60) ve kontrol grubu şeklinde 4 gruba ayrıldı. **Bulgular:** FM şiddeti ile BIQ, BDI, BAI skorları arasında istatistiksel olarak pozitif yönde, FM şiddeti ile fiziksel fonksiyon, fiziksel rol, ağrı, genel sağlık, canlılık, emosyonel rol ve mental sağlık skorları arasında istatistiksel olarak negatif yönde anlamlı korelasyon vardı. Çok değişkenli regresyon analizi BIQ, fiziksel rol, ağrı, genel sağlık ve BDI değerlerinin fibromiyalji ciddiyetine önemli ölçüde katkıda bulunduğunu göstermiştir. **Sonuç:** Çalışmamızın sonuçları FM hastalarında vücut imajı, ruh hali ve yaşam kalitesinin kontrol grubuna göre olumsuz etkilendiğini ve FM şiddetinin anksiyete, depresyon, vücut imgesi ve yaşam kalitesi üzerinde önemli bir etkisi olduğunu göstermektedir.

Anahtar Kelimeler: Fibromiyalji şiddeti; vücut algısı; depresyon; anksiyete; yaşam kalitesi

Fibromyalgia syndrome (FM) is characterized by chronic widespread pain, tenderness, stiffness and fatigue. FM is observed in 2-4% of the population and more commonly among women. Cognitive disorders, nonrestorative sleep and mood disorders frequently accompany the pain. The etiopathogenesis of FM is still unclear, however central sensitization, hormonal dysfunction, pain perception disorder, muscle oxygenation differences, biochemical, genetic and immunological factors are considered to be responsible. Treatment requires a multidisciplinary and professional approach.[1-4]

Body image is a versatile concept that includes the emotional (emotions about bodily functions) and perceptual (related to the body image, shape and size) sensations of an individual about her or his body image and functions. Tactile, proprioceptive and visual inputs are very important for the assessment of body perception. The scales that assess body image perception investigate how much the ideal body image of the individual overlaps with the perceptions of the individual.[5-7]

Chronic pain and disease-induced disability associated with rheumatic diseases are related with impaired quality of life and body perception. Individuals with chronic pain often perceive a distorted body image. Several studies demonstrated that body image perception improved with the alleviation of the symptoms of chronic pain.[8,9]

The aim of the present study was to determine the correlation between disease severity and body image perception, and also to investigate how quality of life and mood were affected by FM severity.

MATERIAL AND METHODS

This is a case control study. A total of 141 female FM patients who were admitted to the physical medicine and rehabilitation outpatient clinic between March 2019 and August 2019 and 30 healthy female volunteers were enrolled in this study. FM was diagnosed based on the ACR 2016 revised diagnostic criteria.[10]

All participants enrolled in the study ranged from 18 to 65 years. The control group included healthy volunteers selected from hospital staff and patients admitted to the hospital. Patients diagnosed with FM secondary to rheumatic, metabolic or other chronic diseases, patients who were not within the age range of 18-65, who had neurological and psychiatric cognitive disabilities, acute infection, anemia, osteomalacia, malignancy and were illiterate were excluded from the study.

Age, height, weight, body mass index (BMI), occupational and educational status of the patients were recorded. Fibromyalgia Impact Questionnaire (FIQ), Body Image Questionnaire (BIQ), Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), and Quality of Life Questionnaire-Short Form (SF-36) were applied to all patients.

In order to define the severity of FM, cases were divided into three groups based on total FIQ scores and categorized as mild (<39), moderate (40-59), severe (≥60).[11] The implementation of the study and evaluation of the results were conducted by the same experienced physical medicine and rehabilitation and psychiatry physician.

FIQ

The FIQ, which has been widely used to analyze the effects of the disease and measure functional state in patients with FM, was developed by Burchardt et al., and its reliability and validity was demonstrated in Turkey.[12,13] It is a 10-item questionnaire that assesses physical functions, occupational status, depression, anxiety, sleep, pain, stiffness, fatigue and well-being. Each of the 10 subscales in FIQ are scored between 0 and 10. Total FIQ score (0-100) is the sum of the scored obtained in 10 FIQ subscales, and low scores indicate improvement or low impact of the disease, except for the well-being status. Higher scores indicate that FM had a high impact on the patient. Average FM patient scores 50 points, while more severely affected FM patients usually score 70 or more points.[14]

BIQ

The BIQ form, which determines the satisfaction of the individual with 40 body parts or functions, is a five-point Likert-type instrument (1=I completely like it, 2=I like it, 3=I am undecided, 4=I do not like it, 5=I completely dislike it) that includes 40 items. The most positive expression is awarded with 1 point and the most negative expression is awarded with 5 points. Accordingly, the lowest possible total score is 40 and the highest total score is 200. A higher total score obtained in the scale indicates a decrease in the satisfaction of the individual with body parts or functions, and a lower score indicates an increase in satisfaction.[15]

SF-36

It is a 36-item questionnaire that aims to measure the quality of life in eight basic physical and emotional areas (physical functionality, functioning of physical role, functioning of emotional roles, functioning of social roles, mental health, vitality, bodily pain and

general health perceptions).[16] Validity and reliability of the scale in Turkish population were demonstrated by Demiral et al.[17]

BDI

The BDI was developed by Beck in 1961 to measure the depression risk among adults and to determine the levels and variations in the severity of depression symptoms.[18] Turkish validity and reliability studies were conducted in 1989 by Hisli.[19] The cut-off point of the scale was defined as 17. It is a self-reported scale that included 21 Likert-type items and has been frequently used in studies on depression. Each item is associated with a behavioral characteristic related with depression. The items are scored between 0 and 3 points based on the severity of depression. Total points range between 0 and 63, where 0-9 range indicates no depressive symptoms, 10-16 indicates mild level symptoms, 17-24 indicates moderate and 25 or higher scores indicate severe depression.

BAI

The BAI was developed by Beck et al.[20] It is a self-reported scale used to determine the frequency of anxiety symptoms experienced by an individual. The scale includes 21 Likert-type items scored between 0 and 3 points. The total score varies between 0 and 63 points. Scores between 0 and 9 points indicate no anxiety, 10-18 indicate mild to moderate anxiety, 19-29 indicate moderate to severe anxiety, and 30-63 indicate severe anxiety. Validity and reliability studies in Turkish language were conducted by Ulusoy.[21]

ETHICS STATEMENT

The study was conducted in accordance with the principles of the Helsinki Declaration.[22] Local ethics committee approval (approval date: 06.02.2019; approval number: 19) and written informed consent forms were obtained before the study.

STATISTICS

All statistical analyzes were conducted with IBM SPSS version 19 (IBM Corp., Armonk, NY, USA).

Descriptive statistics of the data are presented with n (%) and, for non-normalized variables are shown as "median (min-max)", and normal distributions are shown as "mean±SD.

Homogeneity of variance was evaluated using the Levene tests and distrubiton of normality was evaluated with Kolmogorov-Simirnov or Shapiro-Wilk test. ANOVA or Kruskal Wallis test were performed according to normality and post hoc Tukey's test was performed when necessary. Chi-square tests were used to compare categorical data. Spearman correlation coefficient was used for correlation of variables. Multivariate linear regression analysis was performed to investigate independent predictors of FIQ scores. Data were analyzed at 95% confidence interval and those with p values less than 0.05 were considered as significant.

RESULTS

A total of 171 participants were enrolled in the study. The mean ages of the FM patients and healthy controls were 42.18±4.6 and 41.93±5.5 years, respectively. Demographic data of the FM (n=141) and control (n=30) groups are demostrated in Table 1.

We created three FM groups (mild, moderate and severe) according to the FIQ results. When we compared three FM groups and controls, no significant difference was detected in age, BMI and SF-36 social functioning subscale (respectively p=0.918, p=0.247, p=0.299). On the other hand, significant differences were detected in BIQ, SF 36 subscales, BDI and BAI scores among the groups (Table 2).

According to the correlation analyzes, FIQ scores were positively and significantly correlated with BIQ (r=0.861; p<0.001), SF-36 bodily pain subcale (r=0.648; p<0.001), BDI (r=0.595; p<0.001) and BAI (r=0.562; p<0.001) scores. Additionally, negative and significant correlations were detected between FIQ scores and SF-36 general health subscale (r=-0.468; p<0.001), SF-36 physical functioning subscale (r=-0.618; p<0.001), SF-36 role-physical subscale (r=-0.660; p<0.001) and SF-36 role-emotional subscale (r=-0.549; p<0.001) scores. Data are presented in Table 3.

Multivariate linear regression analysis was conducted to investigate independent predictors of FIQ scores (Table 4). Multivariate regression analysis demonstrated that BIQ, SF-36 physical functioning subcale, SF-36 bodily pain subscale, SF-36 general health perceptions subscale and BDI scores significantly contributed to fibromyalgia severity.

TABLE 1: Demographic characteristics of the cases.			
	Fibromyalgia group (n=141)	Control group (n=30)	p
Age, years (mean±SD)	42.18±4.62	41.93±5.54	p=0.381
Body mass index, kg/m^2 (mean±SD)	27.69±4.81	27.63±4.36	p=0.764
Education [number of cases (%)]			
Primary-secondary	98 (69.50%)	20 (66.70%)	p=0.760
College-high school	43 (30.50%)	10 (33.30%)	
Occupation [number of cases (%)]			
Housewife	72 (51.10%)	18 (60.00%)	p=0.467
Official	59 (41.80%)	9 (30.00%)	
Employee	10 (7.10%)	3 (10.00%)	

TABLE 2: Comparison of age, BMI, BIQ, BDI, BAI and quality of life parameters between fibromyalgia and control groups.								
	Control Group 1 n=30		Mild FMS Group 2 n=41		Moderate FMS Group 3 n=45		Severe FMS Group 4 n=55	
	Mean±SD	Median (min-max)	Mean±SD	Median (min-max)	Mean±SD	Median (min-max)	Mean±SD	Median (min-max)	p value
Age (year)	41.93±9.49		41.63±12.03		42.76±11.71		43.05±9.97		0.918
BMI	27.63±4.36		28.69±4.81		26.91±4.10		27.37±3.63		0.247
Body Image	58.47±18.41		68.46±18.43		107.56±18.27		135.55±16.17		<0.001
PF		80 (20.00-100.00)		55 (15.00-100.00)		32.5 (0.00-90.00)		20 (5.00-60.00)	<0.001
Role physical		75 (0.00-100.00)		50 (0.00-100.00)		25 (0.00-100.00)		10 (0.00-50.00)	<0.001
Bodily pain		62 (12.00-84.00)		52 (10.00-84.00)		22 (0.00-62.00)		10 (0.00-52.00)	<0.001
General health		67 (15.00-95.00)		61 (15.00-95.00)		45 (5.00-82.00)		35 (10.00-85.00)	<0.001
Vitality		65 (20.00-85.00)		50 (0.00-85.00)		22.5 (0.00-60.00)		25 (0.00-50.00)	<0.001
SF		70 (25.00-100.00)		62.5 (12.50-100.00)		57.5 (0.00-75.00)		55 (0.00-62.50)	0.299
Role emotional		66.7 (33.30-100.00)		33.33 (0.00-75.00)		22 (0.00-50.00)		10 (0.00-33.30)	<0.001
Mental health		68 (24.00-84.00)		60 (24.00-92.00)		44 (8.00-80.00)		40 (8.00-72.00)	<0.001
BDI	14.93±4.741		16.85±6.810		21.24±5.29		25.87±7.36		<0.001
BAI	16.80±6.014		21.51±7.359		23.76±7.42		33.38±10.201		<0.001

BMI: Body mass index, BIQ: Body image questionnaire, BDI: Beck depression inventory, BAI: Beck anxiety inventory, PF: Physical functioning, SF: Social functioning.

DISCUSSION

FM is a musculoskeletal disorder presented with widespread pain and associated psychophysiological symptoms. Pain is an experience that draws our attention with its negative effects on cognitive and emotional processes, leading to negative quality of life. People suffering from chronic pain often exhibit distorted body image and variable body representation.[5,6] Our results show that patients with FM had higher BIQ scores as compared to healthy controls. Additionally, BIQ scores were associated with disease severity in patients with FM. The deterioration of body image perception is not surprising in diseases such as rheumatoid arthritis progressing with joint de-formities, or ankylosing spondylitis which is associated with posture disorders. Therefore, we consider that it is important to study body image perception changes in patients with FM without joint or postural deformities.

In the present study, it was determined that body image perception was impaired in FM patients when compared to the control group. Furthermore, as the FM severity increased, body image perception was negatively affected. Unlike the previous studies, FM cases were classified based on FIQ scores as mild, moderate and severe in the present study. It was determined that the interaction in BIQ scores reached a dramatic level especially in moderate and severe FM groups when compared to mild FM cases and con-

TABLE 3: The correlation of FIQ scores with BMI, BIQ, BDI, BAI and Quality of Life Parameters.

	FIQ	
	p	r
Age	0.642	0.036
BMI	0.088	-0.131
BIQ	<0.001	0.861
Physical functioning	<0.001	-0.618
Role-physical	<0.001	-0.660
Bodily pain	<0.001	0.648
General health	<0.001	-0.468
Vitality	<0.001	-0.671
Social functioning	0.041	-0.156
Role-emotional	<0.001	-0.549
Mental health	<0.001	-0.440
BDI	<0.001	0.595
BAI	<0.001	0.562

FIQ: Fibromyalgia Impact Questionnaire, BMI: Body mass index,
BIQ: Body image questionnaire, BDI: Beck depression inventory,
BAI: Beck anxiety inventory.

TABLE 4: The effect of different variables on FIQ scores in patients with Fibromyalgia.

	B	Standard error	β	p
BIQ	0.419	0.040	0.592	<0.001
Physical functioning	-0.075	0.037	-0.121	0.046
Bodily pain	-0.138	0.059	-0.129	0.021
General health	0.204	0.063	0.177	0.002
BDI	0.501	0.179	0.150	0.006

R^2=0.892, p<0.001, B: Odds ratio, β: Regression coefficient.
FIQ: Fibromyalgia Impact Questionnaire, BIQ: Body image questionnaire,
BDI: Beck depression inventory.

trols. These findings also demonstrated that in severe FM cases, individual's satisfaction and sensations about his or her body were also negatively affected. Boyington et al. reported negative findings in the body parts associated with the disease (joints), mental functions, self-esteem and health care experiences, activity limitations, and quality of life of individuals with FM.[7] Akkaya et al. demonstrated that body image perception of FM patients was weaker when compared to healthy individuals and this body perception disorder was associated with pain severity, impact of the disease and several mood parameters.[23]

There may be various reasons of body image perception disturbances in patients with FM. Distur-

bances in body image perception were found to be associated with depression and anxiety.[24,25] Novy et al. reported a significant association between body image perception and depression in chronic pain.[26] Considering the high rates of depression and anxiety in patients with FM, disturbances in body image perception can be explained. Another possible mechanism is development of obesity secondary to fatigue and exercise intolerance may change body image perception in patients with FM. Koçyiğit et al. reported a significant positive correlation between BMI and disease activity, depression and anxiety in patients with FM.[27] Boyington JE et al. concluded that disturbances in body image perception were associated with obesity in patients with FM. On the other hand, we found no difference in BMI between the patient and control groups. Thus, disease severity, body image and mood disorders in FM patients should not be interpreted solely due to obesity or overweight.[7]

As an expected result, disease severity was found to be correlated with SF-36 subscales, anxiety and depression scores. Mood disorders play an important role in the etiopathogenesis and treatment of FM. In several studies that compared depressive symptoms in FM patients and healthy controls, the rate of patients with depressive symptoms in the FM patient group was significantly higher when compared to the control group.[28-30] In a study by Homan et al. it was determined that as the severity of depressive symptoms increased, pain intensity increased, daily life activity performance decreased, and quality of life was negatively affected.[31] Uçar et al. reported that there were positive correlations between FM disease severity and pain levels, depression and anxiety tendencies. In parallel with the increase in disease activity elevating pain and fatigue levels, disordered sleep patterns may negatively affect quality of life, depression and anxiety.[9]

When we evaluate the independent factors related to FIQ in patients with FM, BIQ, SF-36 physical functioning subscale, SF-36 bodily pain subscale, SF-36 general health perceptions subscale and BDI scores were found to be significantly contribute to fibromyalgia severity. In a study, it was demonstrated that high depression severity increased the prevalence of FM symptoms and positively correlated with dis-

ease severity. Especially FM patients with moderately severe and severe depression had severe range FIQ scores (70 or higher).[32] In another study, a bidirectional temporal correlation was determined between depression and FM, suggesting that the first clinical picture would increase the severity of the other.[33] Shapiro et al. found a significant correlation between increased FMS severity and body image dissatisfaction, depression, and anxiety. Our results showed that body image perceptions, quality of life and depression are the main determinants of disease severity in FM.[34]

LIMITATIONS

Although the present study was informative, there are certain limitations as well. The first limitation of the study was the fact that the number of participants was relatively small and included only a female population. Second, the fact that this was a qualitative study meant that the findings were subjective and unmeasurable. Third, FIQ scores provided a limited assessment of FM severity. The use of further assessment tools could strengthen the study findings. However, as far as the authors know, the present study was the first to analyze BIQ in FM patients by grouping cases based on FIQ scores. Based on the FM disease severity rating, body perception, quality of life, depression and anxiety parameters decreased in moderate and severe FM patients when compared to control and mild FM cases. The authors could not find a similar study in the literature.

CONCLUSION

The present study demonstrated that body image, mood and quality of life were adversely affected in FM patients when compared to the control group, consistently with previous study findings. The present study findings exhibited that FM severity had a significant effect on anxiety, depression, body image and quality of life in FM population. It could be suggested that alleviation of the disease severity and symptoms in FM patients would affect the body image perception and body representation sensation positively, as well as depressive and anxious disorders and consequently would lead to a significant improvement in quality of life parameters. During the assessment of FM, in order to improve the quality of life of the patients globally, there is a great need for assessment and integration of the interaction between FM severity and body perception and mood, and for psychosomatic and multidisciplinary approaches in the treatment of the disease.

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