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Kinesiophobia and Related Factors in Fibromyalgia Syndrome

Fibromiyalji Sendromunda Kinezyofobi ve İlişkili Faktörler

Uğur Ertem, Alev Alp

Bursa Uludağ University Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Bursa, Turkey

Abstract

Objective: This study aimed to determine the kinesiophobia levels in female patients with fibromyalgia (FMS). In addition, we intended to search the factors associated with kinesiophobia in patients with FMS and to evaluate the effect of kinesiophobia on work outcomes in this patient population.
Materials and Methods: Between January 2021 and May 2021, 50 female patients with FMS and 44 female patients with musculoskeletal pain but not meeting the diagnostic criteria for FMS were included in the study. Pain was evaluated using the numeric scale, kinesiophobia levels with the Tampa Scale for Kinesiophobia (TSK), and the work outcomes with a questionnaire form prepared by us.
Results: The median TSK scores were 41,50 (21-61) in the FMS group and 37 (23-61) in the control group. TSK score was significantly higher in the FMS group (p=0.030). Pain scores (p<0.001), and symptom duration (p<0.001) were significantly associated with high levels of kinesiophobia. When multiple linear regression analysis was performed, it was found that body mass index (p=0.411) was not associated with kinesiophobia levels, whereas age (p<0.001) was associated with kinesiophobia levels. Increased levels of kinesiophobia in patients with FMS patients have been associated with worse work outcomes.
Conclusion: Evaluating the level of kinesiophobia in patients with FMS and developing preventive strategies in the presence of kinesiophobia can provide useful information when creating a treatment program.
Keywords: Fibromyalgia, kinesiophobia, work outcomes

Öz

Amaç: Bu çalışmanın amacı fibromiyaljili (FMS) kadın hastalarda kinezyofobi düzeylerini belirlemektir. Ayrıca, FMS'li hastalarda kinezyofobi ile ilişkili faktörleri araştırmayı ve bu hasta popülasyonunda kinezyofobinin iş sonuçlarına etkisini değerlendirmeyi amaçladık.
Gereç ve Yöntem: Ocak 2021-Mayıs 2021 tarihleri arasında FMS'li 50 kadın hasta ve kas-iskelet ağrısı olan ancak FMS tanı kriterlerini karşılamayan 44 kadın hasta çalışmaya dahil edildi. Ağrı sayısal skala, kinezyofobi düzeyleri Tampa Kinezyofobi Skalası (TSK) ile, çalışma çıktıları tarafımızca hazırlanan anket formu ile değerlendirildi.
Bulgular: TSK ortanca puanları FMS grubunda 41,50 (21-61), kontrol grubunda 37 (23-61) idi. TSK puanı FMS grubunda anlamlı olarak yüksekti (p=0,030). Ağrı skorları (p<0,001) ve semptom süresi (p<0,001) yüksek düzeyde kinezyofobi ile anlamlı şekilde ilişkiliydi. Çoklu lineer regresyon analizi yapıldığında, vücut kitle indeksinin (p=0,411) kinezyofobi düzeyleri ile ilişkili olmadığı, yaşın (p<0,001) ise kinezyofobi düzeyleri ile ilişkili olduğu bulundu. FMS hastalarında artan kinezyofobi seviyeleri, daha kötü iş sonuçlarıyla ilişkilendirilmiştir.
Sonuç: FMS'li hastalarda kinezyofobi düzeyinin değerlendirilmesi ve kinezyofobi varlığında koruyucu stratejiler geliştirilmesi tedavi programı oluşturulurken faydalı bilgiler sağlayabilir.
Anahtar kelimeler: Fibromiyalji, kinezyofobi, iş sonuçları

Introduction

Fibromyalgia syndrome (FMS) is a chronic musculoskeletal pain disease, characterized by sleep disturbances, debility and cognitive symptoms (1,2). FMS is more frequent in females, and its incidence makes a peak in the ages of 40 and 60 years (3,4). The prevalence of FMS varies between 1.3-8% and is the second most common rheumatological disease after osteoarthritis (5). Although many theories have been put forward regarding the pathogenesis of FMS, it has not been clearly explained. Because women in general have lower pain thresholds than men and their symptoms are more clinically exacerbated, the majority of scientific studies have been conducted on women (6). FMS is a chronic health problem presenting with pain all over the body,

Address for Correspondence/Yazışma Adresi: Uğur Ertem MD, Bursa Uludağ University Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Bursa, Turkey
Phone: +90 224 294 00 00-16240 **E-mail:** ugurertem@uludag.edu.tr **ORCID ID:** orcid.org/0000-0003-2142-2264
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tenderness to touch or pressure of the effected parts of the body, fatigue, sleeping and memory problems or clear thinking. Apart from these problems, kinesiophobia, which means the fear of movement, can also be observed in patients with FMS (7).

Kinesiophobia has been defined as an excessive and irrational fear to perform a physical act as a result of a painful injury or a sense of helplessness in the face of the injury (8). Kinesiophobia is present in around 79% of subjects with musculoskeletal pain, and it is associated with greater disability with the indication of a worse prognosis (9,10). Kinesiophobia is a barrier to initiating physical activity in patients or individuals and is an important moderator of response to treatment after physiotherapy and surgery (11). Therefore, determining the kinesiophobia level of the patients and developing preventive strategies, if any, are important for the treatment response.

The aim of this study was to determine the kinesiophobia levels in female patients with FMS. Also, we intended to search the factors associated with kinesiophobia in patients with FMS and to reveal the effect of kinesiophobia on work outcomes in this patient population.

Materials and Methods

This case control study was carried out in Bursa Uludağ University Physical Therapy and Rehabilitation Polyclinic between January 2021 and May 2021. Fifty consecutive female patients who met the 2016 FMS diagnostic criteria were included. As the control group, 44 female patients who did not meet the criteria for the diagnosis of FMS and had musculoskeletal pain were included. Participants in both of the groups were the members of the working population. Patients who have been operated for the musculoskeletal system in the last year, having inflammatory joint disease, having a job for less than 3 months time, and unemployed were not included. An informed consent form was signed by each patient. Permission for the study was obtained from the Bursa Uludağ University Faculty of Medicine is Clinical Research Ethics Committee and the study was approved (decision no: 2020-23/14, date: 23/12/2020). Our study was carried out in accordance with the principles of the Declaration of Helsinki.

Participants' age, body mass index (BMI), and duration of symptoms were recorded. A numeric scale was used to assess the participants' pain level. The patients were informed about the procedure of pain scale. The participants were told that the absence of pain was 0 points and the most severe pain they had experienced in their life was 10 points. Accordingly, the participants were asked to indicate their pain levels.

Tampa Kinesiophobia Scale (TSK), which includes 17 questions, was used for the assessment of kinesiophobia. Each question in the TSK is a minimum of 1 point and a maximum of 4 points. Using this scale, a maximum of 68 points and a minimum of 17 points can be obtained. Higher scores on this scale refers higher levels of kinesiophobia. According to this scale, scores higher than 37 points refer "high level of kinesiophobia", and scores less than or equal to 37 points refer "low level of kinesiophobia" (12-14).

We prepared a 6-question questionnaire to evaluate the work outcomes of patients with FMS. In Question 1, patients were asked how FMS negatively affected their general working life. The "A" option indicated the least affected, and the "D" option was the most affected. In the second question, patients were asked how FMS effected their working performance. The "A" option indicated the least negatively affected, and the "D" option was the most adversely affected. In the third question, the patients were asked how much official permission they took in 1 year due to FMS. The "A" option indicated the least frequent resting permission and the "D" option was the most frequent resting permission. In the 4th question, the patients were asked whether they had any problems in their professional life due to FMS. The "A" option indicated the least problem and the "D" option was the most problematic situation. In the 5th question, the patients were asked whether they had problems with their co-workers due to FMS. The "A" option indicated the least problem and the "D" option was the most problematic situation. In the 6th question, patients were asked whether their social activities at work were affected by FMS. The "A" option was the situation where social activities were least affected, and the "D" option was the situation where social activities were most negatively affected.

Statistical Analysis

Shapiro-Wilk test was used for assessing whether the variables follow normal distribution or not. Continuous variables were presented as median (minimum-maximum) and mean±standard deviation values. Categorical variables were expressed as n (%). Comparisons between the two groups according to the normality test results were made using the Independent sample t test or the Mann-Whitney U test. Pearson chi-square was used to compare categorical variables. Correlations between continuous variables were examined by correlation analysis. Pearson correlation coefficients and Spearman correlation coefficients were determined. Multiple linear regression analysis was used to estimate Tampa Scale for Kinesiophobia score. Variables were included in the multiple linear regression model using the Enter method. Variables that were found to be significant in the model were determined as independent variables. Multiple linear regression model was found to be significant ($p<0.001$). Statistical Package for the Social Sciences (SPSS) (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0, Armonk, NY: IBM Corp.) was used for statistical analysis the level of significance was determined as $p<0.05$.

Results

The distribution of the participants according to their demographic characteristics and clinical variables is given in Table 1. There was no statistically significant difference in age between

patients with FMS and controls (p>0.05). But, the pain scores, symptom duration, TSK scores and BMI were significantly higher in the FMS group (p<0.05).

We separated the FMS group into two groups according to their TSK scores as low kinesiophobia level (n=18) and high kinesiophobia level group (n=32). Pain scores, symptom duration, and BMI were significantly higher in the high-level kinesiophobia group (p<0.05) (Table 2).

The correlations of demographic characteristics and clinical parameters with TSK scores in patients with FMS are given in Table 3. There was no statistically significant correlation between TSK scores and the age of the patients (p=0.989). A positive and significant correlation was found between TSK scores and pain levels, symptom duration and BMI (p<0.001).

Multiple linear regression analysis was performed to identify factors related to kinesiophobia in FMS group. The established logistic regression model was significant (p<0.001). According to the results of the analysis, pain scores, age, and symptom duration were significantly associated with TSK scores (p<0.001) (Table 4).

We divided the FMS group into low kinesiophobia group (n=18) and high kinesiophobia group (n=32) according to TSK scores. The distribution of the responses of these 2 groups to the questionnaire is given in Table 5. To analyze the internal reliability of the questionnaire, the Cronbach's alpha coefficient of the questions answered by the patients about their work life and their social relationships in work life was used. The internal reliability of the study was found to be excellent (α=0.914). According to the answers given to the questionnaire, it was determined that FMS patients with high kinesiophobia marked "C" and "D" options, which represent worse work results, more than patients with low kinesiophobia (Table 5).

Discussion

Psychological factors such as thinking things will get worse or fear that movement will increase pain are among the poor prognostic factors for FMS (15). In this case, it shows us that fibromyalgia and kinesiophobia are conditions that effect each other. In a study by Koçyiğit et al. (13) in which they compared the kinesiophobia levels of participants with FMS and healthy volunteers, kinesiophobia scores were higher in the FMS group. In a study examining kinesiophobia and related factors in patients with systemic lupus erythematosus; a significant relationship was found between kinesiophobia and depression and some subscales of quality of life (16). FMS related pain and functional disability may increase depression and anxiety (17). Considering

Table 3. Correlation between kinesiophobia scores and demographic and clinical characteristics in fibromyalgia patients

n=50	Tampa scale for kinesiophobia scores	
	r	p
Age	0.002[d]	0.989
Numeric scale	0.788[e]	<0.001
Symptom duration	0.496[e]	<0.001
Body mass index	0.519[d]	<0.001

[d]: Pearson correlation coefficient, [e]: Spearman correlation coefficient

Table 1. Demographic and clinical variables of fibromyalgia and control groups

n=94	FMS group (n=50)	Control group (n=44)	p
Age (year)	38.04±7.98	35.32±7.34	0.090[a]
Numeric scale (pain)	6.00 (3-9)	5.00 (2-8)	0.007[b]
Body mass index (kg/m^2)	25.20 (17-35)	23.20 (17-35)	0.049[b]
TSK scores	41.50 (21-61)	37 (23-61)	0.030[b]
Symptom duration (year)	6 (1-10)	4 (1-10)	0.025[b]

FMS: Fibromyalgia syndrome, TSK: Tampa Scale for Kinesiophobia
Data are expressed as mean±standard deviation and median (minimum-maximum).
[a]: Independent Sample t-test, [b]: Mann-Whitney U Test

Table 2. Comparison of demographic characteristics and clinical variables between low- and high-level kinesiophobia groups in patients with fibromyalgia

n=50	Low levels of kinesiophobia (n=18)	High levels of kinesiophobia (n=32)	p
Age (year)	37.67±9.06	38.25±7.46	0.807[a]
Numeric scale (pain)	4.50 (3-6)	7 (4-9)	<0.001[b]
Symptom duration (year)	3 (1-10)	7 (1-10)	<0.001[b]
Body mass index (kg/m^2)	22.72±3.67	26.71±4.52	0.002[a]

Data are expressed as mean±standard deviation and median (minimum-maximum).
[a]: Independent Sample t-test [b]: Mann-Whitney U Test

Table 4. Factors related kinesiophobia levels in fibromyalgia patients

				95% Confidence interval for B		
	Unstd. B	**Standart error**	**t**	**Lower bound**	**Upper bound**	**p**
Constant	25,386	5,224	4.86	14,864	35,907	**<0.001**
Numeric scale (pain)	5,044	0.642	7,852	3.75	6,338	**<0.001**
Body mass index (kg/m^2)	-0.187	0.225	-0.831	-0.64	0,266	0.411
Age (year)	-0.466	0.108	-4,297	-0.684	-0,247	**<0.001**
Symptom duration (year)	1,558	0.303	5,146	0.948	2,167	**<0.001**
n=50, R^2=0.783, Adj. R^2=0.763 (F=40,508, **p<0.001**)						

Unstd. B: Unstandardized beta coefficients

Table 5. Comparison of answers to survey questions between low and high kinesiophobia levels groups in patients with fibromyalgia

		Low levels of kinesiophobia (n=18)	**High levels of kinesiophobia (n=32)**
First question	A	4 (22.22%)	0
	B	11 (61.11%)	12 (37.50%)
	C	**3 (16.67%)**	20 (62.50%)
	D	**0**	0 (0.00%)
Second question	A	5 (27.78%)	1 (3.12%)
	B	10 (55.56%)	8 (25.00%)
	C	**2 (11.11%)**	**14 (43.75%)**
	D	**1 (5.56%)**	**9 (28.12%)**
Third question	A	16 (88.89%)	21 (65.62%)
	B	2 (11.11%)	9 (28.12%)
	C	0	**2 (6.25%)**
	D	0	0
Fourth question	A	4 (22.22%)	0
	B	7 (38.89%)	8 (25.00%)
	C	6 (33.33%)	**18 (56.25%)**
	D	1 (5.56%)	**6 (18.75%)**
Fifth question	A	9 (50.00%)	5 (15.62%)
	B	6 (33.33%)	14 (43.75%)
	C	3 (16.67%)	**9 (28.12%)**
	D	0	**4 (12.50%)**
Sixth question	A	4 (22.22%)	2 (6.25%)
	B	9 (50.00%)	12 (37.50%)
	C	5 (27.78%)	**10 (31.25%)**
	D	0	**8 (25.00%)**

Data are expressed as n (%)

the connection between depression and kinesiophobia, we can say that this situation may increase kinesiophobia scores in patients with FMS. The results of our study support the results of previous studies in patients with FMS, and it was found that kinesiophobia levels with FMS was higher than the control group.

Exacerbation of symptoms following physical activity is characteristic for FMS. These exacerbations make it understandable for people with FMS to develop kinesiophobia (18). In a study conducted in our country, Koçyiğit and Akaltun (13) found that 75.1% of the participants with FMS had high kinesiophobia levels. In another study, 72.9% of patients with FMS were found to have high levels of kinesiophobia (19). According to the literature, we can say that pain and fear of activity are common in FMS patients (20-22). The current study, high levels of kinesiophobia were detected in 64% of patients with FMS (TSK scores >37). High levels of kinesiophobia in more than half of the FMS patients (64%) in the results of our study supports the results in the literature.

In a study, pain levels and psychological state were found to be effective on fear of movement and therefore on functional status and quality of life in patients with ankylosing spondylitis (14). Vlaeyen et al. (23) showed that kinesiophobia was associated with gender, compensation status, and depression, but to a much lesser degree with pain intensity in patients with chronic low back pain. Another study in the literature, BMI levels, FMS disease activity levels and vitamin D levels were found to be associated with kinesiophobia levels in patients with FMS (13). In a systematic review, it was concluded that pain levels were associated with the levels of kinesiophobia in participants with chronic musculoskeletal pain (8). Our study, a positive correlation was detected between pain levels, symptom duration and high kinesiophobia levels. We consider that an increase in the duration of symptoms in patients with FMS increases depression and deterioration in functionality, and therefore may be related to kinesiophobia. In addition, we think that the increase in pain scores may have increased the level of kinesiophobia by causing the feeling that the severity of pain will increase more with movement and thus causing the behavior of avoiding movement. When BMI was taken alone, it was found to be associated with kinesiophobia levels in FMS group, but when multiple linear regression analysis performed, it was found not to be associated with kinesiophobia levels. On the contrary, the age variable was found to be unrelated to the level

of kinesiophobia when the correlation analysis was performed alone, while it was found related with kinesiophobia levels when the multiple linear regression analysis was performed.

In a study examining relationship between work outcomes and kinesiophobia, decreasing the level of kinesiophobia increased the level of work ability (24). Macías-Toronjo et al. (25) reported that kinesiophobia and catastrophizing were associated with sick leave duration in patients with work-related neck and low back pain. The study of Sugano et al. (26) showed that long or increased working hours may be a risk factor for chronic musculoskeletal pain. It showed that this was related with stronger fear-avoidance beliefs and reduced work outcomes. In general, previous studies showed that high kinesiophobia levels are related with reduced work outcomes. According to the answers given to the questionnaire, FMS patients with high kinesiophobia levels marked "C" and "D" options, which represent worse work results, more than patients with low kinesiophobia levels. Conversely, FMS patients with low kinesiophobia levels marked "A" and "B" options, which represent better work outcomes, more than patients with high kinesiophobia levels.

Study Limitations

The current study had some limitations. This was a single-center study with a small number of female-only subjects; this situation limits the generalization of our results. In addition, the participants among the groups were heterogeneously distributed. Moreover results obtained do not provide clear information, since the questionnaire form we use to evaluate the work outcomes is not a valid questionnaire created by us.

Conclusion

In conclusion, kinesiophobia levels of FMS group were significantly higher. The kinesiophobia levels in people with FMS can affect many areas, including work outcomes of individuals. Exercise therapy, especially aerobic exercises, are among the most important treatment methods in the treatment of FMS, and the presence of kinesiophobia limits the exercise of FMS patients. For this reason, evaluation of the kinesiophobia levels and the development of preventive strategies in the presence of kinesiophobia can provide useful information when creating a treatment prescriptions.

Ethics

Ethics Committee Approval: Bursa Uludağ University Faculty of Medicine is Clinical Research Ethics Committee approval was obtained for the study with the number of 2020-23/14 (date: 23/12/2020). This study adheres to the ethical rules reported in the 1964 Helsinki Declaration, which were revised in 2013.

Informed Consent: A written acceptance certificate was requested from the patients included in the study.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: U.E., A.A., Concept: U.E., A.A., Design: U.E., A.A., Data Collection or Processing: U.E., A.A., Analysis or Interpretation: U.E., A.A., Literature Search: U.E., A.A., Writing: U.E., A.A.

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