ORIGINAL RESEARCH ORİJİNAL ARAŞTIRMA

Evaluation of Adherence to Walking Prescriptions of Women with Fibromyalgia and Factors Predicting Adherence to Walking Prescriptions: A Cross-Sectional Study

Fibromiyaljili Kadınların Yürüme Reçetelerine Uyumunun ve Yürüme Reçetelerine Uyumu Öngören Faktörlerin Değerlendirilmesi: Kesitsel Bir Çalışma

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The preliminary results of this study were presented as an oral presentation at the 8th Medical Rehabilitation Congress (9-13 November 2022, Ankara).

ABSTRACT Objective: There is limited data on compliance with unsupervised walking recommendations as physical exercise in patients with fibromyalgia (FM). The aims of this study were 1) to evaluate whether walking for exercise was recommended by their physiatrist in a sample of Turkish women with FM who received pharmacological treatment, 2) to determine the frequency of patients who walk for exercise, 3) to clinically compare patients who walk for exercise and those who do not, and 4) to identify factors associated with adherence to walking prescriptions. **Material and Methods:** 100 female patients with FM were included in this cross-sectional study. Walking for exercise was evaluated according to a specific criterion. The patients were categorized as "walking for exercise" and "not walking for exercise". Outcome measures included Fibromyalgia Impact Questionnaire, visual analogue scale (VAS), Tampa Kinesiophobia Scale (TKS) and the Pain Catastrophizing Scale (PCS). **Results:** Walking for exercise was recommended by their physiatrist to 77% of women with FM. 26% of the patients were determined as "walking for exercise". The rate of adherence to walking prescriptions was 32.47%. VAS at movement (p=0.030), PCS (p=0.019) and TKS (p=0.012) scores were statistically significantly lower in the "walking for exercise" group than in the "not walking for exercise" group. Logistic regression analysis showed that the decrease in TKS score independently contributed to adherence to walking prescriptions. **Conclusion:** Our results suggest that clinical interventions aiming to reduce fear of movement would help increase adherence to walking prescriptions.

Keywords: Exercise; fibromyalgia; walking

ÖZET Amaç: Fibromiyaljisi (FM) olan hastalarda denetimsiz yürüme önerilerine uyum konusunda sınırlı veri bulunmaktadır. Bu çalışmanın amacı: 1) farmakolojik tedavi alan FM'si olan Türk kadınlardan oluşan bir örneklemde fiziyatrist tarafından egzersiz amaçlı yürümenin bu hastalara önerilip önerilmediğini değerlendirmek, 2) egzersiz amaçlı yürüyen hastaların yürüme sıklığını belirlemek, 3) egzersiz amaçlı yürüyen hastalarla yürümeyen hastaları klinik olarak karşılaştırmak ve 4) yürüme reçetelerine uyum ile ilişkili faktörleri belirlemektir. **Gereç ve Yöntemler:** Bu kesitsel çalışmaya 100 FM'si olan kadın hasta dâhil edildi. Egzersiz amaçlı yürüyüş belirli bir kritere göre değerlendirildi. Hastalar "egzersiz amaçlı yürüyen" ve "egzersiz amaçlı yürümeyen" olarak kategorize edildi. Sonuç ölçütleri arasında Fibromiyalji Etki Anketi, görsel analog skala [visual analogue scale (VAS)], Tampa Kinezyofobi Skalası (TKS) ve Ağrı Felaketleştirme Ölçeği (AFÖ) yer aldı. **Bulgular:** FM'si olan kadınların %77'sine fizyoterapistleri tarafından egzersiz amaçlı yürüme önerildi. Hastaların %26'sının "egzersiz amaçlı yürüyüş" yaptığı belirlendi. Yürüme reçetelerine uyum oranı %32,47 idi. Hareket hâlindeki VAS (p=0,030), AFÖ (p=0,019) ve TKS (p=0,012) skorları "egzersiz amaçlı yürüyen" grupta "egzersiz amaçlı yürümeyen" gruba göre istatistiksel olarak anlamlı derecede düşük olarak saptandı. Lojistik regresyon analizi, TKS skorundaki azalmanın bağımsız olarak yürüme reçetelerine uyuma katkıda bulunduğunu gösterdi. **Sonuç:** Sonuçlarımız, hareket korkusunu azaltmayı amaçlayan klinik müdahalelerin yürüme reçetelerine uyumu artırmaya yardımcı olabileceğini göstermektedir.

Anahtar Kelimeler: Egzersiz; fibromiyalji; yürüme

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Fibromyalgia (FM) is a disease characterized by chronic, widespread musculoskeletal pain as well as sleep disturbances, fatigue, and other somatic and cognitive symptoms.[1] FM affects approximately 2% to 4% of the general population and the average female/male ratio for FM is 3/1 worldwide.[2,3]

FM treatment can be divided into four main parts: patient education, physical activity, pharmacological treatment and psychotherapy.[4] The only "strong" recommendation in the latest recommendations of European League Against Rheumatism (EULAR) is exercise.[5] Aerobic exercise with moderate intensity has been demonstrated to improve physical function, pain intensity, fatigue, depression, and quality of life.[6,7] The recommended walking in FM is a low-to-moderate intensity exercise that can be easily adapted to the patient's condition.[8]

Studies evaluated in a systematic review and meta-analysis to investigate the adherence of women with FM to programs that included walking exercise, the majority of which consisted of supervised exercise sessions, showed moderate to high rates of adherence overall.[9] Nonetheless, there is limited data on compliance with unsupervised walking recommendations as physical exercise.

Considering the exercise recommendation in FM guidelines and the health benefits of exercise, it is important to evaluate whether physiatrists recommend walking as exercise, adherence of women with FM to walking prescriptions, and the factors associated with the adherence in terms of rehabilitation programs and clinical applications.

In this context, the aims of this study were: 1) to evaluate whether walking for exercise was recommended by their physiatrist in a sample of Turkish women with FM who received pharmacological treatment, 2) to determine the frequency of patients who walk for exercise, 3) to clinically compare patients who walk for exercise and those who do not, and 4) to identify factors associated with adherence to walking prescriptions.

■ MATERIAL AND METHODS

STUDY DESIGN AND PARTICIPANTS

This study was designed as cross-sectional. 100 female patients who applied to Ankara Gaziler Physi-

cal Medicine and Rehabilitation Hospital Physical Medicine and Rehabilitation Outpatient Clinics between March 2022 and June 2023 and were diagnosed with FM according to the American College of Rheumatology criteria participated in the study. Inclusion criteria were as follows: 1) aged between 18-70 years, 2) female gender (to create a homogeneous population since patients with FM are mostly female), 3) patients prescribed pharmacological treatment within the last 1 year.[10] Exclusion criteria were as follows: 1) presence of orthopedic problem or neurological disease that may cause functional impairment, and 2) presence of neurological deficit. The informed consent was obtained from the patients. The study protocol was approved by Ankara City Hospital Ethics Committee (date: January 19, 2022, no: E2-22-1257). Clinical trial registration was performed for this study (NCT05996692). The research was conducted in accordance with the principles of the Declaration of Helsinki.

DEMOGRAPHIC AND CLINICAL ASSESSMENT

Demographic data of the patients such as age, weight, height, education level, marital status, occupation, smoking and alcohol use, comorbidities, and the time elapsed after FM diagnosis were recorded.

Walking for exercise was evaluated according to a specific criterion (at least 30 minutes of walking, including a series of 15-minute walks at least twice a week for at least six consecutive weeks, with a small rest period between the walking series) based on recommendations in the literature.[11] Based on this specific criterion, patients were classified as "walking for exercise" and "not walking for exercise".

The patients were asked the following questions: 1) Have they been advised by their physiatrist to walk for exercise? (Yes/No), 2) Do they walk for exercise? (Yes/No), 3) If they are walking for exercise; how many times a week and how long do they walk each time? 4) How many weeks in a row do they maintain the habit of walking?

The severity of the patients' widespread pain at rest and during movement in the last 1 week was evaluated with a 10-point visual analogue scale (VAS) (0-no pain; 10-worst pain imaginable).

The functional status of the patients was assessed using The Fibromyalgia Impact Questionnaire (FIQ). This questionnaire evaluates physical function, anxiety, depression, job status, sleep, pain, fatigue, stiffness, and well-being. The questionnaire is scored between 0-100. Higher scores indicate lower functional status and higher disease severity. Sarmer et al. demonstrated the reliability and validity of the Turkish version of the FIQ.[12]

The kinesiophobia level of the patients was measured using the Tampa Kinesiophobia Scale (TKS).[13] The questionnaire contains 17 questions [from 1 (strongly disagree) to 4 (strongly agree)] using a 4-point Likert-type scale. The Turkish version of the TKS has been demonstrated to be valid and reliable.[14] The higher the score, the higher the level of kinesiophobia. Scores of 37 and above in TKS were regarded as high kinesiophobia.

The pain catastrophizing status of the patients was assessed using the Pain Catastrophizing Scale (PCS), which includes 13 questions. In this scale, each question is scored between 0 and 4 (0=never, 4=always) on a 5-point Likert-type scale. The total score ranges from 0 to 52.[15] Higher scores indicate higher levels of pain catastrophizing. Ugurlu et al. performed the validity study of the Turkish version.[16]

STATISTICAL ANALYSIS

The sample size estimation was performed by means of the G*power (V3.1) (Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany; http://www.gpower.hhu.de/) statistical package. To achieve 92% power, alpha value of 0.05 and 0.62 effect size, 50 patients per group ("walking for exercise" group and "not walking for exercise" group) was needed.[17] Therefore, 100 patients were determined for the study. Data analysis was carried out using SPSS version 23.0 software (IBM Corp., Armonk, NY, USA). Shapiro-Wilk test demonstrated the normality of data distribution. Mean±standard deviation was used for continuous variables, while percentage (%) was used for categorical variables. Independent samples t-test, Mann-Whitney U test and Pearson chi-square test were used to compare patients walking for exercise and not walking for exercise. Logistic regression analysis was performed to determine predictors of patients who adhere to walking

prescriptions and patients who do not. Age, body mass index (BMI), time elapsed after FM diagnosis, VAS at movement, FIQ-total, PCS and TKS were the independent factors involved in the model. Odds ratios and 95% confidence intervals were calculated. A p-value less than <0.05 was regarded as statistically significant.

RESULTS

According to the specific criteria for "walking for exercise" mentioned above, 26% of the patients were determined as "walking for exercise" and 74% as "not walking for exercise". When the patients walking for exercise (n=26) and those who did not walk for exercise (n=74) were compared in terms of demographic data, no statistically significant difference was found between the two groups (p>0.05 for all) (Table 1).

Walking for exercise was recommended by their physiatrist to 77% of women with FM who received pharmacological treatment. The rate of adherence to walking prescriptions of patients who were recommended walking as exercise (n=77) was 32.47%. Table 2 shows the data on the walking habits of the patients.

When the two groups were clinically compared, the VAS at movement (p=0.030), PCS (p=0.019) and TKS (p=0.012) scores were statistically significantly lower in the "walking for exercise" group than in the "not walking for exercise" group (Table 3).

Logistic regression analysis showed that the decrease in TKS score independently contributed to adherence to walking prescriptions (Table 4).

DISCUSSION

Our study showed that the rate of a sample of Turkish women with FM who walk for exercise is low and pharmacological treatment was started in some of the patients without the recommendation of walking. Walking for exercise had a positive effect on clinical outcomes, and the decrease in the kinesiophobia score was independently associated with adherence to the walking prescriptions.

It has been shown that physical exercise has very positive effects in reducing fatigue, stiffness, and depression, in pain management, and in helping patients

Demographic data	Total (n=100)	Patients walking for exercise (n=26)	Patients not walking for exercise (n=74)	p value
TABLE 1: Comparison of demographic data of patients walking for exercise and not walking for exercise.				
Age (years)	49.030±7.307	50.500±6.610	48.513±7.511	0.235
Body mass index (kg/m^2)	26.256±4.506	27.428±4.491	25.846±4.468	0.065
Education level				
≤ High school	58 (58)	15 (57.70)	43 (58.10)	0.971
> High school	42 (42)	11 (42.30)	31 (41.90)	
Marital status				
Married	85 (85)	23 (88.46)	62 (83.78)	0.566
Single	15 (15)	3 (11.54)	12 (16.22)	
Employment status				
Not working	57 (57)	18 (69.23)	39 (52.70)	0.143
Working	43 (43)	8 (30.77)	35 (47.30)	
Cigarette smoking				
Yes	35 (35)	5 (19.23)	30 (40.54)	0.050
No	65 (65)	21 (80.77)	44 (59.46)	
Alcohol use				
Yes	13 (13)	5 (19.23)	8 (10.81)	0.272
No	87 (87)	21 (80.77)	66 (89.19)	
Comorbidity				
Yes	56 (56)	16 (0.64)	40 (54.05)	0.386
No	43 (43)	9 (0.36)	34 (45.95)	
Medication				
Duloxetine	67 (67)	16 (61.5)	51 (68.9)	0.453
Pregabalin	17 (17)	6 (23.1)	11 (14.9)	
Duloxetine+pregabalin	8 (8)	3 (11.5)	5 (6.8)	
Gabapentin	1 (1)	0 (0)	1 (1.4)	
Amitriptyline	3 (3)	0 (0)	3 (4.1)	
Sertraline	2 (2)	0 (0)	2 (2.7)	
Escitalopram	1 (1)	1 (3.8)	0 (0)	
Fluoxetine	1 (1)	0 (0)	1 (1.4)	
Time elapsed after fibromyalgia diagnosis (months)	63.950±67.091	79.230±70.249	58.581±65.589	0.058

Data were presented as mean±standard deviation for continuous variables and as number (percentage) for categorical variables.

develop a more positive attitude towards their disease.[6,18,19] Walking, which can be adapted well to lifestyle, is one of the most recommended physical activities due to its low risk of musculoskeletal injury, inexpensive and easy.[20]

There are several studies conducted in Spain on unsupervised walking as physical exercise and associated factors in women with FM.[17,21-23] To the best knowledge of the authors, there was no study investigating this issue in Turkish women with FM. Cultural and ethnic differences may have an impact on the findings.

In our study, pharmacological treatment was started in 23% of the patients without the physiatrist's

recommendation for walking as exercise. In the study conducted by Peñacoba et al., it was stated that 22.5% of women with FM were not given medical advice to walk, similar to our study. In this study, unlike our study, information about the pharmacological treatment of the patients was not mentioned.[21] The fact that the physiatrist's recommendations regarding physical activity other than walking were not asked in the study can be considered as a bias. Nevertheless, the latest recommendations of EULAR on FM management emphasize the importance of using non-pharmacological methods first in FM management.[5] Considering the positive effect of walking on clinical outcomes, as shown in our study, doctor's recommendation about walking is important.

TABLE 2: Evaluation of patients' walking habits.	
	n (%)
Advice from physiatrist to walk for exercise (n=100)	
Yes	77 (77)
No	23 (23)
Number of days of walking for exercise (n=100)	
0	47 (47)
1	8 (8)
2	10 (10)
3	18 (18)
≥4	17 (17)
Daily time spent walking for exercise (n=100)	
<30 minutes	65 (65)
30-60 minutes	31 (31)
>60 minutes	4 (4)
Number of weeks of walking for exercise (n=100)	
0	48 (48)
1-2	16 (16)
3-4	4 (4)
≥6	32 (32)
Adherence to recommended walking prescriptions for exercise (n=77)	
Yes	25 (32.47)
No	52 (67.53)
Self-reported reasons for non-adherence to recommended walking prescriptions for exercise (n=52)	
Fatigue	10 (19.2)
Increased pain	10 (19.2)
Seasonal conditions	7 (13.5)
Workload	25 (48.1)

Furthermore, medical advice has been shown to increase the probability of walking in patients with FM.[8]

The rate of patients who walked regularly for exercise was 26% in our study. This is consistent with the 30.8% rate found in the study by López-Roig et al.[8] Previous literature has compared patients who walk as exercise and those who do not. In a study conducted by Catala et al. on women with FM, function, and overall impact subscales of the revised FIQ and helplessness subscale of the PCS were found to be lower in those who walked regularly than in those who did not walk regularly. In this study, unlike our study, patients with a pain level above 7 were included.[22] Similar to our study, Sanromán et al. found that women with FM who walked for exercise had lower pain catastrophizing scores than women who did not walk.[17]

The rate of adherence to walking prescriptions of 32.47% in our study is lower than in previous studies. Sanromán et al. found that 58.15% of women with FM adhere to walking as exercise.[17] In another study, it was stated that adherence to low-intensity walking programs ranged from 50% to 62.5%.[8] There is evidence that including behavioral or educational techniques to promote accomplishment, or incorporating education, cognitive behavioral therapy, or relaxation has positive effects on adherence.[23,24] Physiatrists should encourage patients with FM to increase adherence to walking programs.

Previous studies have investigated several possible psychosocial and clinical factors related to walking adherence in women with FM.[22] The presence of fatigue and pain has been shown to be the main inhibitors of walking.[25] Factors predicting walking adherence in those with severe pain levels were stated as negative affect and function subscale of revised FIQ.[22] In another study in which multivariate analysis was performed by controlling pain levels, it

TABLE 3: Clinical comparison of patients walking for exercise and not walking for exercise.			
Clinical parameters	**Patients walking for exercise (n=26)**	**Patients not walking for exercise (n=74)**	**p value**
Fibromyalgia Impact Questionnaire-total (0-100)	52.230±16.853	57.333±17.684	0.193
VAS at rest (0-10)	5.153±2.989	6.108±2.840	0.148
VAS at movement (0-10)	4.492±3.069	6.243±2.616	**0.030***
Pain Catastrophizing Scale (0-42)	22.576±13.923	29.378±12.058	**0.019***
Tampa Kinesiophobia Scale (17-68)	38.346±6.032	42.162±6.707	**0.012***
Kinesiophobia			
Low	10 (38.46)	13 (17.57)	**0.029***
High	16 (61.54)	61 (82.43)	

Data are presented as mean±standard deviation and number (percentage). VAS: Visual analogue scale. * : p<0.05

TABLE 4: Logistic regression analysis of the variables predictive of adherence to walking prescriptions (n=77).

	B	Odds ratio	95% confidence interval	p (Wald test)
Age (years)	0.018	1.108	0.939-1.104	0.660
Body mass index (kg/m²)	0.092	1.096	0.948-1.266	0.214
Time elapsed after fibromyalgia diagnosis (months)	0.009	1.009	0.999-1.019	0.077
Visual analogue scale at movement	-0.244	0.784	0.598-1.027	0.077
Fibromyalgia Impact Questionnaire-total	0.017	1.017	0.970-1.066	0.492
Pain Catastrophizing Scale	-0.006	0.994	0.941-1.049	0.819
Tampa Kinesiophobia Scale	-0.110	0.896	0.811-0.990	**0.031***

* : p<0.05

was shown that catastrophizing, FM impact, and depression had a negative contribution to walking adherence.[26]

In our study, kinesiophobia was a factor that negatively contributed to unsupervised walking adherence. Similarly, kinesiophobia was mentioned in the previous literature as an obstacle to adherence to rehabilitation in different chronic pain conditions.[27] In a qualitative description study, it was mentioned that behavioral beliefs such as exhaustion, pain, fatigue, and discomfort anticipated by women with FM could generate fear of movement.[28] As a result, fear of movement prevents patients from adhering to walking-based FM treatment.[28] Rehabilitation programs consisting of analysis of the behavioral beliefs associated with fear of movement would help adhere to a walking-based treatment.[29]

Although the study was conducted on a small single-center sample from Türkiye, it is beneficial in raising awareness of unsupervised walking as exercise in patients with FM.

Some limitations exist in the study. The number of participants in our study is overall small. Exclusion of male patients from the study prevents the generalizability of our findings. Results were derived from self-reported data. No technological application that records walking data was used. Scales evaluating the physical activity level of the patients were not used. Last but not least, the cross-sectional design of the study limits to draw causal conclusions.

CONCLUSION

Considering the positive effects of walking on clinical outcomes, it is important that physiatrists recommend walking as exercise to women with FM. Our results suggest that clinical interventions aiming to reduce kinesiophobia would help increase adherence to walking prescriptions.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Merve Örücü Atar, Fatma Özcan, Serdar Kesikburun; Design: Merve Örücü Atar, Fatma Özcan; Control/Supervision: Serdar Kesikburun; Data Collection and/or Processing: Ayşenur Şimşek Yağlıoğlu, Gizem Kılınç Kamalı, Gizem Maç; Analysis and/or Interpretation: Merve Örücü Atar, Serdar Kesikburun; Literature Review: Merve Örücü Atar, Ayşenur Şimşek Yağlıoğlu, Gizem Kılınç Kamalı, Gizem Maç; Writing the Article: Merve Örücü Atar; Critical Review: Serdar Kesikburun, Gizem Kılınç Kamalı, Gizem Maç.

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