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ARAŞTIRMA / RESEARCH

Investigation of the Relationship Between Osteoarthritis Severity, Pain, Lower Extremity Muscle Strength, Kinesiophobia, and Quality of Life in Individuals with Knee Osteoarthritis

Diz Osteoartritli Bireylerde Osteoartrit Şiddeti, Ağrı, Alt Ekstremite Kas Kuvveti, Kinezyofobi ve Yaşam Kalitesi Arasındaki İlişkinin İncelenmesi

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Abstract

Objective: Osteoarthritis (OA) is among the primary causes of chronic disability. Pain and other symptoms of OA may have an effect on function and quality of life. The study aims to investigate the relationship between osteoarthritis severity, pain, muscle strength, kinesiophobia, and quality of life in individuals with knee OA.

Material and Method: 100 patients with knee OA were enrolled in this study. The mean age of the patients was 65.50±2.74 years and the mean body mass index was 27.89±1.21 kg/m^2. The severity of OA was evaluated with the Lequesne Algofunctional Index (LAI). Pain levels and their effect on function were evaluated with the Visual Analog Scale (VAS) and WOMAC Osteoarthritis Index; functional muscle strength with the Sit-to-Stand Test (5-STS) and Stair Test (ST); kinesiophobia with the Tampa Kinesiophobia Scale; quality of life with the SF-12 Scale.

Results: There was a weak correlation between LAI and VAS rest (r=0.34), VAS night (r=0.30), and SF-12 mental score (r=-0.20) (p<0.05). There was a moderate correlation between LAI and VAS act (r=0.40), ST (r=0.46), 5-STS (r=0.47), and WOMAC with all sub-parameters (r=0.57, 0.55, 0.52, 0.46, respectively), SF-12 score (r=-0.46), SF-12 physical score (r=-0.41) (p<0.05).

Conclusion: As the severity of OA increases, the pain intensity increases, and the functional lower extremity strength decreases. Moreover, as the kinesiophobia level increases, the quality of life decreases. In the process of controlling the progression of OA severity, reducing pain and increasing strength might prove beneficial in diminishing the level of kinesiophobia and increasing the quality of life.

Keywords: Osteoarthritis, kinesiophobia, quality of life, pain, function.

Öz

Amaç: Osteoartrit (OA), kronik özürlülüğün başlıca nedenleri arasındadır. Ağrı ve OA'nın diğer semptomları, fonksiyon ve yaşam kalitesi üzerinde etkili olabilir. Bu çalışmada diz OA'lı bireylerde osteoartrit şiddeti, ağrı, kas kuvveti, hareket korkusu ve yaşam kalitesi arasındaki ilişkinin araştırılması amaçlandı.

Gereç ve Yöntem: Bu çalışmaya diz OA'sı olan 100 hasta dahil edildi. Hastaların ortalama yaşı 65,50±2,74 ve beden kitle indeksi 27,89±1,21 kg/m^2 idi. OA şiddeti Lequesne Algofunctional Index (LAI) ile değerlendirildi. Ağrı düzeyleri ve fonksiyon üzerine etkileri Görsel Analog Skala (VAS) ve WOMAC Osteoartrit İndeksi ile değerlendirildi; 5-Tekrarlı Otur Kalk Testi (5-STS) ve Merdiven İnip Çıkma Testi (ST) ile fonksiyonel kas kuvveti; Tampa Kinezyofobi Ölçeği ile kinezyofobi; SF-12 Ölçeği ile yaşam kalitesi değerlendirildi.

Bulgular: LAI ile VAS istirahat (r=0,34), VAS gece (r=0,30) ve SF-12 mental skor (r=-0,20) arasında zayıf bir korelasyon vardı (p<0.05). LAI ile VAS dinlenme (r=0,34), VAS gece (r=0,30) ve SF-12 mental skor (r=-0,20) arasında zayıf bir korelasyon vardı (p<0.05). LAI ile VAS akt (r=0.40), ST (r=0.46), 5-STS (r=0.47) ve WOMAC arasında tüm alt parametrelerle (r=0.57, 0.55, 0.52, 0.46, sırasıyla), SF-12 puanı (r=-0.46), SF-12 fiziksel puanı (r=-0.41) arasında orta düzeyde korelasyon vardı (p<0.05).

Sonuç: OA şiddeti arttıkça ağrı şiddeti artmakta ve fonksiyonel alt ekstremite kuvveti azalmaktadır. Ayrıca kinezyofobi düzeyi arttıkça yaşam kalitesi de düşmektedir. OA şiddetinin ilerlemesini kontrol etme sürecinde, ağrıyı azaltmak ve kas kuvvetini artırmak, kinezyofobi düzeyini azaltmak ve yaşam kalitesini artırmak açısından faydalı olabilir.

Anahtar Kelimeler: Osteoartrit, kinezyofobi, yaşam kalitesi, ağrı, fonksiyon.

1. Introduction

Osteoarthritis (OA) is a chronic condition characterized by the gradual deterioration of joint structures related to the whole joint due to various factors, and most often occurs in the knee joint (1). 250 million people worldwide are affected by OA (2). The prevalence of OA has experienced a significant increase since the mid-20th century, with a projected rise in incidence expected in the future (3,4). Hip and knee OA contribute burden of disease substantially, and when considered together, they are ranked 11th among 291 diseases ranked by the World Health Organization based on the level of disability. Contrary to earlier perceptions of OA primarily affecting older individuals, recent research has revealed that its onset occurs earlier than previously believed. OA now ranks among the top 20 diseases within the 40 to 45 years age bracket (5). Among people who are 65 years of age or older, knee OA poses a higher risk of mobility disability compared to any other medical condition (6). Epidemiological studies have demonstrated that OA leads to a greater number of sick leaves and disabilities compared to the general population. Moreover, OA is associated with more difficulties in ambulating and ascending stairs than any other musculoskeletal disease (7).

The most prevalent and significant symptom of OA is pain. The muscles, tendons, ligaments, and joint capsules surrounding the knee undergo weakening and damage, resulting in a decline in proprioceptive sensation. These physiological changes give rise to symptoms such as pain, stiffness, swelling, muscle weakness, and a deterioration in quality of life (QoL). Additionally, they contribute to physical disabilities, including difficulties with gait, ascending stairs, sitting, and standing up (4). OA is also linked to increased mortality, particularly from cardiovascular causes, with physical inactivity as a significant mediating factor (5).

Lately, the fear-avoidance model has emerged as a framework elucidating the interplay between chronic pain and disability. This model sheds light on how emotional, cognitive, and behavioral components intertwine in the handling of chronic pain and its subsequent disability. Essentially, it provides insight into how individuals' emotions, thought processes, and actions can either contribute to or mitigate the persistence of pain and the limitations on daily functioning. In accordance with the fear-avoidance model, psychological elements, including the tendency to catastrophize pain and the development of kinesiophobia are posited as potential risk factors in the progression of chronic pain and disability. This suggests that an individual's mental framework and apprehensions concerning pain and movement can exacerbate the level and duration of pain and may also contribute to functional impairments. The fact that fear of pain associated with painful activities is an important cognitive factor related to chronic pain, disability, anxiety, depression, and treatment efficacy in knee OA patients has become more and more recognized over time (8). In addition to this, low-level physical activity can cause muscle weakness when patients tend to refrain from engaging in physical activity due to the presence of pain. Impairment of quadriceps femoris muscle performance may reduce the knee joint's stabilization ability and contribute to intra-articular structure injuries. This may increase disability and reduce the QoL in patients with knee OA (9).

Considering the significant effects of knee OA on health and socioeconomic costs over the years, it may be crucial to delve into the correlation between the functional and daily living activities of people and the factors mediating these effects such as OA severity, pain, kinesiophobia, QoL, and for reducing costs and burdens. In addition, the results regarding the related factors and the relationships between them may be useful when creating a treatment program. Therefore, the purpose of this study is to investigate the relationship between OA severity and pain, lower extremity muscle strength, kinesiophobia, and QoL in patients with knee OA.

2. Materials and Methods

2.1. Participants

Patients with knee OA between March 2022 and December 2022 were included. Ethical approval of the study was granted by Ethics Committee. Knee OA patients who applied to the physical therapy and rehabilitation clinic of Izmir Katip Celebi University Ataturk Training and Research Hospital where the study was conducted were invited to the study. Eligible patients have given their informed consent.

The estimated sample size was calculated in the G-Power 3.1.9.7 application (Correlation: Bivariate normal model). When power was taken as ß=85%, probability of error as α=0.05, effect size=0.30, and the minimum number of participants in the study was determined as at least 96.

The criteria for inclusion in our study were being over 18 years old, diagnosed with knee OA, volunteering to participate, and having the ability to read and understand Turkish. Exclusion criteria were being to use any auxiliary equipment, not being able to perform independent daily living activities, having had steroid injections into the knee joint in the last 6 months, having undergone lower extremity surgery, to having any neurological, vestibular, and orthopedic problems.

2.2. Outcome Measures

Sociodemographic and anthropometric data (gender, age, body mass index, occupation, education status), and health-related habits (cigarette use and exercise habits) of the individuals were recorded. Then, the severity of OA was assessed with the Lequesne Algofunctional Index (LAI), pain intensity and the effect of pain on function were assessed with the Visual Analog Scale (VAS) and WOMAC Osteoarthritis Index; functional muscle strength of the lower extremity with the 5 Times Sit-to-Stand Test and Stair Test kinesiophobia with the Tampa Kinesiophobia Scale; QoL with the SF-12 Scale.

The Lequesne Algofunctional Index (LAI): It is a health-related QoL tool for knee OA. The assessment comprises three subscales: pain or discomfort, maximum walking distance, and activities of daily living. The cumulative score is derived by adding up the scores from each of the three measurements, resulting in an overall score. The overall score spans from 0 (no pain or disability) to 24 (maximum disability and/or pain) (16).

Visual Analog Scale (VAS): The VAS is an easily applicable scale with proven validity and reliability, which is frequently used in studies on the musculoskeletal system to determine the severity of pain perception. The VAS contains a 100 mm horizontal line, in which patients will be asked to mark the degree of pain they feel (10). Pain during rest (VASrest), during activity (VASact), and during the night (VASnight) were evaluated.

The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC): It was developed to examine the disability level in patients with hip or knee OA and consists of 24 disease-specific subscales (WOMAC pain, WOMAC stiffness, and WOMAC function). Higher scores indicate worse symptoms or limitations (11).

The Stair Test (ST): It is a valid and reliable functional performance test that determines the patient's stair climbing performance and lower extremity strength. Individuals will be asked to go up and down the steps one by one as quickly as possible, and a trial will be allowed before the test starts so that the individual can fully understand the test. Individuals can only hold the handrail if needed for balance (13).

The 5-Times Sit-to-Stand Test (5-STS): The 5-STS will be used to determine the functional strength of the lower extremity. Patients will be asked to stand up and sit down 5 times as fast as they can in a stable chair without arm support, with their arms crossed on the chest. The time will be started with the "Start" command and will end when the participant's hip touches the chair after the 5th repetition is completed (14).

The Tampa Kinesiophobia Scale: Kinesiophobia was determined with the Tampa Kinesiophobia Scale. The total score on the scale evaluating the kinesiophobia status is between 17-68. A greater score reflects increased kinesiophobia levels (12).

The SF-12 Scale: It is used to assess health-related QoL. It has sufficient psychometric properties to be used in clinical practice and scientific investigations. The SF-12 contains 8 sub-dimensions and 12 items which are physical functionality (2 items), physical role (2 items), body pain (1 item), general health (1 item), energy (1 item), social functionality (1 item), emotional role (2 items), and mental health (2 items). Both the scores of physical (SF-12 physical) and mental (SF-12 mental) subdimensions span from 0 to 100, where elevated scores signify superior health (15).

2.3. Statistical analysis

SPSS 26.0 will be used for statistical analysis. The distribution of data was investigated by using the Kolmogorov–Smirnov test. Descriptive statistics were given as a number (n), percent (%), and mean ± standard deviation. The relationships between variables were provided with Pearson correlation analysis. The level of significance was accepted as $p<0.05$.

3. Results

100 patients (74 females, 26 males) were enrolled. The mean age of the participants was 65.50 ±2.74 years, and the mean BMI was 27.89 ± 1.21 kg/m^2. The other demographic characteristics are indicated in Table 1. The mean LAI score was 12.90±0.70. The mean VAS act was 5.96±0.76, the VAS rest was 3.13±0.48, and the VAS night was 5.30±0.83. The mean WOMAC score was 47.30±2.25, the WOMAC pain subscore was 9.80±0.48, the WOMAC stiffness subscore was 3.40±0.33, and the WOMAC function subscore was 34.10±1.94. The mean 5-STS score of the patients was 24.62±2.68 sec and the SF-12 was 85.89±4.10 sec. The mean Tampa score was 28.70±1.78, the mean SF-12 physical was 36.03±2.42, and the SF-12 mental was 49.85±2.64. The scores of the functional measures are indicated in Table 2.

Table 1. The Demographic Characteristics of the Patients

Variables	Number
-Education Level	
Primary School	68
Secondary School	9
High School	12
University Graduates	11
- **Occupation**	
Housewife	56
White-collar	10
Blue-collar	13
Retired	21
-Tobacco Use	
Yes	29
No	71
-Alcohol Use	
Yes	11
No	89
-Leg-Dominance	
Right	66
Left	34
-Primarily Affected Leg	
Right	54
Left	46

There was a weak correlation between LAI and VAS rest ($r=0.34$) ($p<0.01$), VAS night ($r=0.30$) ($p<0.05$), and SF-12 mental score ($r=-0.20$) ($p<0.05$). There was a moderate correlation between LAI and VAS act ($r=0.40$) ($p<0.001$), WOMAC with all sub-parameters ($r=0.57, 0.55, 0.52, 0.46$, respectively) ($p<0.001$), ST ($r=0.46$) ($p<0.001$), 5-STS ($r=0.47$) ($p<0.001$), SF-12 score ($r=-0.46$) ($p<0.001$), SF-12 physical score($r=-0.41$) ($p<0.001$). The correlations between the functional measures are presented in Table 3.

4. Discussion

This study aimed to investigate the relationship between OA severity and pain, lower extremity muscle strength, QoL, and kinesiophobia in patients with knee OA. According to our results, the severity of OA was positively correlated with pain and negatively correlated with the lower extremity muscle strength and quality of life at different rates. As the severity of the OA increased, pain also increased, and quality of life and lower extremity muscle strength decreased.

OA is primarily characterized by pain as its predominant symptom. The pain gradually diminishes the patients' physical well-being, leading to a decline in strength,

flexibility, physical function, and activities of daily living (17). Bindawas et al. (18) compared knee OA patients' pain levels according to disease severity and reported that severe knee OA was significantly associated with pain. Elbaz et al. (19) found a correlation between pain and knee OA severity in their study which they included 2911 knee OA patients. Kwon et al. (20) created a machine-learning model of 375 patients with various knee OA severity, identifying an association between gait features and OA severity. Gait analysis features were utilized to make predictions about the severity of OA. Our study also observed that as the OA severity increases the pain during rest, night, and activity. The pain in knee OA may originate from structural changes such as bone marrow lesions and synovitis. Additionally, alterations in nerve processing and nerve sensitization may contribute to pain in OA (21). Identifying the underlying factors leading to pain in an individual patient can be highly advantageous in facilitating more precise targeting of appropriate therapies. This approach aids in minimizing symptoms and enhancing overall functionality, leading to improved patient outcomes.

Table 2. The Scores of the Functional Measures

	Mean	Standard deviation
5-STS	24.62	2.68
WOMAC	47.30	2.25
WOMAC pain	9.80	0.48
WOMAC stiffness	3.40	0.33
WOMAC function	34.10	1.94
Tampa	28.70	1.78
SF-12	85.89	4.10
SF-12 physical	36.03	2.42
SF-12 mental	49.85	2.64
LAI	12.90	0.70
VASact	5.96	0.76
VASrest	3.13	0.48
VASnight	5.30	0.83

WOMAC: The Western Ontario and McMaster Universities Osteoarthritis Index, VAS: Visual Analog Scale, 5-STS: 5 Times Sit-to-Stand Test, ST: The Stair Test, WHO: World Health Organization, QoL: Quality of life

Muscle strength deficiency is one of the most common clinical presentations of knee OA and may further increase the disability by leading to a reduction in force generation and increased stress on the articular surfaces (25). Liikavainio et al. (26) examined the objective physical function of the lower extremities, characteristics of the m. quadriceps femoris, and disabilities in patients with knee OA and compared the results with age and sex-matched controls. They found that the severity of OA was correlated to lower extremity muscle strength. Knoop et al. (27) compared clinical outcomes of various subgroups of 842 patients with knee OA and discussed that lower extremity muscle strength is associated with OA severity. Baert et al. (28) investigated the alterations in muscle strength in patients with knee OA compared to control subjects and reported that quadriceps weakness might accelerate the occurrence and advancement of the pathology. Similar to them, the OA severity was positively correlated to lower extremity muscle strength in our study. The decline in muscle strength observed in OA may be attributed to various factors, including disuse atrophy resulting from pain, reflexive muscle inhibition, and the inability to fully activate the muscles (29,30). Clinicians need to develop strategies targeting lower extremity muscle strength for the prevention and rehabilitation of knee OA.

Kinesiophobia is prevalent in patients with knee OA and influences their clinical and functional status (31). Alaca (32) found that there was a positive correlation between the clinical/functional status and kinesiophobia levels in her study on 78 patients with knee OA. Kanniappan et al. (33) found that the OA progression is associated with kinesiophobia. They concluded that as the level or stage of OA advances, the severity of pain intensifies, subsequently resulting in a heightened level of kinesiophobia. All these factors further lead to a deterioration in physical function in patients with knee OA. Aydemir et al. (34) reported that kinesiophobia affects muscle strength and physical activity levels. They concluded that kinesiophobia mediates muscle and physical activity levels in patients with knee OA. Ekediegwu et al. (35) reported that kinesiophobia and the count of coexisting medical conditions were significantly correlated with each other in their study on 70 patients with knee OA. In our study, there was no correlation between OA severity and kinesiophobia. Psychological aspects serve as a pivotal factor in the initiation, maintenance, and exacerbation of OA severity (33). Fear of pain and movement may limit patients with OA from engaging in physical activity, leading to further disability and functional impairment contributing to a cycle of interconnected symptoms, including disuse, disability, depression, and persistent pain, perpetuating a challenging and interdependent pattern (34). Thus, psychological factors are also needed to be assessed in the treatment of knee OA. Biopsychosocial approaches with appropriate psychotherapies may be administered to treat such cases (36). Education materials that promote precise patient understanding and beliefs regarding treatment alternatives and empower patients need to be implemented in the rehabilitation process to facilitate desirable lifestyle behaviors (37). Decreasing kinesiophobia must be among the primary goals of rehabilitation in this population (38).

Knee OA may have a significant effect on the QoL of patients by causing pain, and disability subsequently hindering various aspects of daily living (22). Xie et al. (23) evaluated the correlations between potential factors that may influence QoL in 912 knee OA patients and found that the patients who are at advanced levels of OA had worse QoL. Alkan et al. (24) assessed the QoL and reported that the patients with knee OA had significantly worse QoL compared with healthy controls. Additionally, the physical function subscore of the SF-36 scale significantly correlated with OA severity. Bindawas et al. (18) investigated the relationship between OA severity and QoL in 209 knee OA patients with various disease severity and found that the severity of knee OA was associated with a decline in QoL. In our study, the severity of OA was also negatively correlated to the QoL. The pain, stiffness, and swelling caused by the degenerative changes seriously alter the QoL which is a significant outcome measure for health conditions and the evaluation of treatments (24). Enhancing the QoL is

Table 3. The Relationships Between the Functional Measures of the Patients

		Lequesne	VAS act	VAS rest	VAS night	ST	5-STS	Tampa	WOMAC	WOMAC pain	WOMAC stiffness	WOMAC function	SF-12	SF-12 physical	SF-12 mental
Lequesne	r		0.40	0.34	0.30	0.46	0.47	0.79	0.57	0.55	0.52	0.40	0.46	0.41	0.20
	p		0.001**	0.01*	0.02*	0.001**	0.001**	0.43	0.001**	0.001**	0.001**	0.001**	0.001**	0.001**	0.04*
VAS act	r	0.40		0.28	0.34	0.25	0.13	0.07	0.47	0.50	0.25	0.42	0.40	0.49	0.14
	p	0.001**		0.004*	0.001**	0.01*	0.16	0.18	0.001**	0.001**	0.014*	0.001**	0.001**	0.001**	0.15
VAS rest	r	0.34	0.28		0.41	0.16	0.27	0.07	0.26	0.52	0.14	0.16	0.15	0.21	0.02
	p	0.01*	0.004*		0.001**	0.11	0.005*	0.44	0.007*	0.001**	0.15	0.09	0.11	0.03*	0.77
VAS night	r	0.30	0.34	0.41		0.10	0.09	0.38	0.31	0.65	0.04	0.04	0.04	0.04	0.04
	p	0.02*	0.001**	0.001**		0.29	0.33	0.001**	0.01*	0.001**	0.67	0.67	0.67	0.67	0.67
ST	r	0.46	0.25	0.16	0.10		0.66	0.01	0.30	0.24	0.24	0.24	0.24	0.24	0.24
	p	0.001**	0.01*	0.11	0.29		0.001**	0.89	0.002*	0.01*	0.01*	0.01*	0.01*	0.01*	0.01*
5-STS	r	0.47	0.13	0.27	0.09	0.66		0.06	0.36	0.36	0.36	0.36	0.36	0.36	0.36
	p	0.001**	0.16	0.005*	0.33	0.001**		0.53	0.001**	0.001**	0.001**	0.001**	0.001**	0.001**	0.001**
Tampa	r	0.79	0.07	0.07	0.38	0.01	0.06		0.31	0.30	0.30	0.30	0.30	0.30	0.30
	p	0.43	0.18	0.44	0.001**	0.89	0.53		0.002*	0.002*	0.002*	0.002*	0.002*	0.002*	0.002*
WOMAC	r	0.57	0.47	0.26	0.31	0.30	0.36	0.31		0.72	0.72	0.72	0.72	0.72	0.72
	p	0.001**	0.001**	0.007*	0.01*	0.002*	0.001**	0.002*		0.001**	0.001**	0.001**	0.001**	0.001**	0.001**
WOMAC pain	r	0.55	0.50	0.52	0.65	0.24	0.31	0.30	0.72		0.37	0.37	0.37	0.37	0.37
	p	0.001**	0.001**	0.001**	0.001**	0.01*	0.002*	0.002*	0.001**		0.001**	0.001**	0.001**	0.001**	0.001**
WOMAC stiffness	r	0.52	0.25	0.14	0.04	0.09	0.19	0.03	0.58	0.37		0.44	0.44	0.44	0.44
	p	0.001**	0.014*	0.15	0.67	0.34	0.04*	0.74	0.001**	0.001**		0.001**	0.001**	0.001**	0.001**
WOMAC function	r	0.46	0.42	0.16	0.21	0.28	0.34	0.34	0.95	0.55	0.44		0.55	0.61	0.61
	p	0.001**	0.001**	0.09	0.03*	0.004*	0.001**	0.001**	0.001**	0.001**	0.001**		0.001**	0.001**	0.001**
SF-12	r	0.46	0.40	0.15	0.33	0.15	0.10	0.28	0.58	0.49	0.34	0.55		0.62	0.62
	p	0.001**	0.001**	0.11	0.01*	0.12	0.31	0.004*	0.001**	0.001**	0.001**	0.001**		0.001**	0.001**
SF-12 physical	r	0.41	0.49	0.21	0.32	0.18	0.21	0.37	0.63	0.56	0.25	0.61	0.62		0.95
	p	0.001**	0.001**	0.03*	0.01*	0.06	0.03*	0.001**	0.001**	0.001**	0.01*	0.001**	0.001**		0.005
SF-12 mental	r	0.20	0.14	0.02	0.16	0.03	0.04	0.08	0.21	0.17	0.24	0.20	0.76	0.95	
	p	0.04*	0.15	0.77	0.11	0.76	0.67	0.41	0.028*	0.08	0.01*	0.04*	0.001**	0.005	

*p<0.05, **p<0.01, Pearson and Spearman's correlations, WOMAC: The Western Ontario and McMaster Universities Osteoarthritis Index, VAS: Visual Analog Scale, 5-STS: 5 Times Sit-to-Stand Test, ST: The Stair Test, WHO: World Health Organization, QoL: Quality of life

a fundamental objective of healthcare, and quality of life serves as a valuable tool to measure progress in achieving this goal. Furthermore, QoL is a predictor of the amount of medical care that OA patients will require. Therefore, QoL can assist in making decisions regarding the distribution of limited healthcare resources and the development of health policies (23).

4.1. Limitations

Firstly, the investigated factors and their relationship with each other could not be investigated over time. Additionally, we used some subjective outcome measures. Even though the patients replied honestly, there may be still some recalling biases in such measures.

5. Conclusion and Recommendations

Knee osteoarthritis is not yet reversible, and its pathogenesis is still not clear. Multiple internal and external risk factors contribute to its formation and advancement. The easiest and cheapest management of knee osteoarthritis is prevention. Osteoarthritis is a disease that greatly affects the functionality of the lower extremity with its effects on many factors such as pain, limitation of movement, decreased muscle strength, and restricts daily living activities due to these effects, especially in elderly individuals. Determining the factors that increase the risk of developing osteoarthritis and disseminating the knowledge of how osteoarthritis affects different aspects of life is important in recognizing osteoarthritis and preventing its physical disability and social adjustment disorder.

Considering the significant effects of the disease on health and socioeconomic costs over the years, it is worthwhile to

investigate the relationship between people's functional and daily living activities and the factors that cause these effects such as pain, kinesiophobia, lower extremity muscle strength, quality of life and osteoarthritis severity. In addition, it is predicted that the results obtained regarding the related factors and the relationships between them will be useful for the people working in clinics to create treatment and rehabilitation programs.

6. Contribution to the Field

This study reveals the significance of psychosocial and physical factors as mediating factors in knee OA. It also emphasizes different aspects of pain and activities of daily living to enlarge the vision of knee OA patients' experiences.

The Ethical Aspect of the Research

Ethical approval of the study was granted by İzmir Katip Çelebi University Non-Interventional Clinical Research Ethics Committee with the date 24.02.2022 and decision number 0087. Eligible patients have given their informed consent.

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Conflict of Interest

This article did not receive any financial fund. There is no conflict of interest regarding any person and/or institution.

Authorship Contribution

Concept: SGU, TT, KSK, HU, KBB; **Design:** SGU, TT, KSK, HU, KBB; **Supervision:** SGU, TT, KSK, HU, KBB; **Funding:** -; **Materials:** -; **Data Collection/Processing:** SGU, TT, KSK, KBB; **Analysis/Interpretation:** SGU, TT, KSK; **Literature Review:** SGU, TT, KSK, HU; **Manuscript Writing:** SGU, TT, KSK; **Critical Review:** SGU, TT, KSK, HU, KBB.

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