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Pain, Physical Activity, and Kinesiophobia Levels in Individuals with Knee Osteoarthritis: A Cross-Sectional Study

Diz Osteoartritli Bireylerde Ağrı, Fiziksel Aktivite ve Kinezyofobi Düzeyleri: Kesitsel Bir Çalışma

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ABSTRACT Objective: This study was conducted to determine the levels of pain, physical activity and kinesiophobia of individuals with knee osteoarthritis and to examine the relationship between these variables. **Material and Methods:** This cross-sectional and analytical study was conducted on 290 people who applied to the physical therapy and rehabilitation center of a university hospital in the Central Black Sea Region, diagnosed with bilateral knee osteoarthritis at least 6 months ago, and had a pain level of 4 or more on the Visual Analogue Scale-Pain. **Results:** Indicating that women, individuals who are single, people with chronic diseases and using drugs when they have pain; pain, physical function, stiffness and kinesiophobia mean scores were higher than other groups ($p<0.05$). Most of the individuals had low physical activity levels. There is a moderately positive correlation between kinesiophobia score and pain, physical function, stiffness scores ($p<0.05$). At the same time, there was a significant positive correlation between pain score and stiffness, physical function scores ($p<0.05$). **Conclusions:** It was determined that the total mean score of pain and kinesiophobia of individuals with osteoarthritis was moderate, physical activity score is low. Female gender, being single, having a chronic disease and using medication when in pain that has been determined that there are important factors affecting pain and kinesiophobia. It is important for nurses to evaluate pain and decrease in physical activity and kinesiophobia levels in individuals with osteoarthritis at an early stage.

Keywords: Pain; physical activity; nursing; kinesiophobia; osteoarthritis

ÖZET Amaç: Bu çalışma, diz osteoartritli bireylerin ağrı, fiziksel aktivite ve kinezyofobi düzeylerini belirlemek ve bu değişkenler arasındaki ilişkiyi incelemek amacıyla yapılmıştır. **Gereç ve Yöntemler:** Kesitsel ve analitik türdeki bu çalışma, Orta Karadeniz Bölgesi'nde bir üniversite hastanesinin fizik tedavi ve rehabilitasyon merkezine başvuran, en az 6 ay önce bilateral diz osteoartriti tanısı almış ve Görsel Analog Ağrı Skalası'nda ağrı düzeyi 4 veya üzeri olan 290 bireyle gerçekleştirilmiştir. **Bulgular:** Kadınların, bekâr bireylerin, kronik hastalığı olan ve ağrısı olduğunda ilaç kullananların; ağrı, fiziksel fonksiyon, tutukluk ve kinezyofobi puan ortalamaları diğer gruplara göre daha yüksekti ($p<0,05$). Bireylerin çoğu düşük fiziksel aktivite seviyelerine sahipti. Kinezyofobi puanı ile ağrı, fiziksel fonksiyon, tutukluk puanları arasında orta düzeyde pozitif bir ilişki vardır ($p<0,05$). Aynı zamanda ağrı skoru ile sertlik, fiziksel fonksiyon skorları arasında pozitif yönde anlamlı bir ilişki saptanmıştır ($p<0,05$). **Sonuç:** Osteoartritli bireylerin ağrı ve kinezyofobi toplam puan ortalamalarının orta düzeyde, fiziksel aktivite puanlarının düşük olduğu belirlenmiştir. Kadın cinsiyet, bekâr olmak, kronik bir hastalığa sahip olmak ve ağrılıyken ilaç kullanmanın, ağrı ve kinezyofobiyi etkileyen önemli faktörlerden olduğu tespit edilmiştir. Hemşirelerin, osteoartritli bireylerde ağrı ve fiziksel aktivitedeki azalmayı ve kinezyofobi düzeylerini erken dönemde değerlendirmesi önemlidir.

Anahtar Kelimeler: Ağrı; fiziksel aktivite; hemşirelik; kinezyofobi; osteoartrit

Osteoarthritis (OA) especially affects the hip, knee, hand and vertebral colon joints. It prevents individuals to experience pain and physical disability, and to continue their daily life activities. It is a degenerative joint disease that is among the leading causes of disability worldwide.[1-3] The most common symptoms in OA are; pain, stiffness and loss of physical function.[1-4] Due to the symptoms seen in OA, individuals gradually decrease their physical activities, and with these limitations, the individual faces both deterioration in the joint structure and quality of life.[3-5] Individuals with OA restrict their movements, especially because of the pain they have experienced, and this inactivity caused by individuals causes the

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disease to progress further.[3,5] These anxiety of individuals against activity and physical movement are defined as kinesiophobia. As a result of increased pain perception, the person is afraid to move and avoids moving to deal with pain.[6] The definitions of both OA and kinesiophobia include the concepts of pain, avoidance, physical activity. In this context, kinesiophobia is an important clinical finding for individuals with OA and can be seen as a reason for physical disability.[7] It is studied in various disease groups such as kinesiophobia, chronic pain and chronic fatigue syndrome and is associated with increased pain and decrease in physical activity level.[8]

Knee OA limits a person's ability to exercise, while the individual should avoid high-impact exercise while maintaining a low-impact exercise routine. Because exercise is necessary both for the health of the musculoskeletal system, and for each weight gained from sedentary life, an equal amount of pressure is created, especially on the knees, and the disease progresses further.[3] However, it is noteworthy that the level of physical activity is rarely evaluated in studies conducted with individuals with OA.[9] It has been reported that the methods that directly measure physical activity are high in cost and are not often used for individuals with OA in research.[9] Although studies use subjective methods that evaluate physical activity, it is emphasized that objective measurements are more important to determine the physical activity of individuals with OA. Therefore, it has been reported that the use of physical activity scale is more meaningful.[9] Studies examining the relationship between kinesiophobia and physical activity levels are limited to small sample size and there is no consistency between results. In addition, potential determinants of physical activity levels in individuals with knee OA have not yet been investigated.[9] Therefore, the study was conducted to determine the pain, physical function, stiffness, kinesiophobia and physical activity levels of individuals with knee OA and to examine the relationship between these variables.

MATERIAL AND METHODS

The research was carried out in a cross-sectional and analytical study design with individuals who applied to the outpatient clinic of a university's physical therapy and rehabilitation center. The universe of the research was composed of all individuals with OA for 1 year between 02.07.2018-08.08.2019 who applied to outpatient clinics of a university physical therapy and rehabilitation center and who were hospitalized in the services. The scope of the research; including all OA individuals who have been diagnosed with OA at least 6 months ago, who have bilateral knee OA, have Visual Analogue Scale-Pain (VAS-P) scores of 4 and above, are open to communication and cooperation, and agree to participate in the study. The sample of the study consisted of 290 OA individuals who met the criteria for admission to the outpatient clinic for one year between 02.07.2018-08.08.2019. After participating in the research, 9 people who were missing data were excluded from the study. According to the result of the post hoc Power [G*power 3.1 software (version 3.1, Institute for Experimental Psychology, Düsseldorf, Germany)] analysis made as a result of the study; with 95% confidence interval, d=0.488 effect size, the power of the test was found to be Power (1-β err probe) 99%.

DATA COLLECTION AND RESEARCH TOOLS

The data were collected face-to-face OA individuals who applied to the outpatient clinics of a university between the dates of 02.07.2018-08.08.2019. In the study, patient identification form, Visual Analogue Scale Pain (VAS Pain Severity Measurement), The Western Ontario and McMaster Universities (WOMAC) Scale, Tampa Kinesiophobia Scale (TSK) and International Physical Activity Questionnaire (IPAQ) were used as data collection tools. The data were collected in the hospital environment between 09:00 and 16:00, as a result of interviews with individuals with each OA for about 20-30 minutes. There is no bias in the research. The researchers were not at the data collection stage. Data were collected by health experienced/trained pollsters.

PATIENT DESCRIPTION FORM

The questionnaire, which was prepared by reviewing the literature, consists of 22 questions including the patient's introductory features and information about the disease.[1,4,5,9]

VAS-P

VAS was used to measure pain intensity. VAS-P is used to convert some values that cannot be measured

numerically into numerical values. It is a scale whose beginning is -0- "no pain", the other end is -10- "very severe pain" and numerical values are given to each cm at intervals of one centimeter (cm). The most intense pain intensity the patient feels is marked by the patient. The scale does not have a language and its ease of application is its important advantage. The scale has proven itself for a long time and is a safe and easily applicable scale accepted in the world literature. Zero points are considered as no pain, 1-2 points as mild pain, 3-4 points as slightly excessive pain, 5-6 points as moderate pain, 7 and above as severe pain.[10] The numbered horizontal version of VAS-P was used in the study.

THE WOMAC OA INDEX

The WOMAC is a valid and safe method that is widely used to evaluate individuals with OA. Outcome Measures in Rheumatology Clinical Trials is a criterion recommended for OA studies. The validity and reliability study of the Turkish translation of WOMAC was conducted by Tüzün et al.[11] The WOMAC OA index consists of 3 sections and 24 questions asking about the state of pain, stiffness and physical function. High WOMAC values indicate an increase in pain and stiffness and impairment of physical function. All parameters in the WOMAC index are evaluated using the Likert pain scale. It is widely used in individuals with WOMAC OA, which is a disease-specific health status criterion.

While evaluating the subtitle of pain, the severity of pain felt in the last 24 hours is asked. For the stiffness sub parameter, the feeling of stiffness is defined first and the joint stiffness felt in the last 24 hours of the joint or joints evaluated is measured with 2 questions. For physical function score, 17 activities that have difficulty in performing joints or joints due to OA in the last 24 hours are asked. The score of each subsection is calculated on its own and the total score ranges from 0 to 96. Scoring ranges from 0-20 for pain, 0-8 for stiffness, and 0-68 for physical function. High scores indicate increased pain and stiffness and impaired physical function.[11]

TSK

TSK was developed by Miller, Kopri and Todd in 1991 and has not been published. Vlaeyen et al. published the article in 1995 with the permission of researchers who developed the original scale.[12] TSK is a 17-question checklist developed to measure individuals' movement/repeat injuries, avoidance and fears, and is used in acute and chronic low back pain, fibromyalgia and musculoskeletal injuries and whiplash related diseases. Four points Likert scoring (1=Strongly disagree, 4=I totally agree) is done in the scale. After reversing items 4, 8, 12 and 16, a total score is calculated, the person gets a total score between 17-68. The high score on the scale indicates that the kinesiophobia is also high. It is recommended to use the total score in the studies.[13]

In the present study, the Cronbach's alpha coefficient of TSK was 0.854.

IPAQ-SHORT FORM

It is about the time that individuals spend physically in the last 7 days, and evaluation is made according to the types of physical activity they do as part of their daily lives. In 1996, in order to examine the health and physical activity levels of the society and the relationship between them, IPAQ survey developed by Michael Booth; it is designed in 2 ways, long and short form. In this research, IPAQ short questionnaire form was used. Short form (7 questions); walking provides information about the time spent on moderate to severe activities. The calculation of the total score of the short form includes the sum of walking, moderate activity, and duration (minutes) and frequency (days) of severe activity. From these calculations, a score in MET-minutes is obtained. One Met-minute; it is calculated by multiplying the minutes of the activity and the MET score. After the calculations, the results are categorically classified.[14]

These categories are:

I category: Inactive ones: <600 MET- min/week

II category: Minimum active ones: 600<-<3000 MET-min/week

III category: Highly active:>3,000 MET-min/week

DATA ANALYSIS

In the evaluation of the data; descriptive variables are shown with percentage, mean and standard deviation.

Student t-test and one-way analysis of variance were used in comparisons between groups, and pearson correlation analysis was used to determine the relationship between variables. Simple linear regression was performed. In all analyzes, $p<0.05$ value was considered statistically significant.

ETHICAL CONSIDERATIONS

The study was conducted in accordance with the Declaration of Helsinki. In order to carry out the research, Ethics Committee Approval from the Amasya University's Non-Interventional Clinical Research (date: March 27, 2018, IRB no: 3-06) and written permission from the university hospital, where the research was conducted, were obtained. The purpose of the research was explained to the individuals participating in the study and their consent was obtained for the research.

RESULTS

DEMOGRAPHICS INFORMATION

Individuals with OA 61.4% of the who are women, 79.0% are married, 36.6% are primary school graduates, 69.0% are pre-obese and obese, 58.3% have moderate income, 55.9% are in the city center. And the average age of individuals is 59.86±15.64. It has been determined that 46.9% of individuals have another chronic disease and 85.5% do not exercise, 75.2% are independent in daily life activities (DLA) and 25.9% use assistive devices during daily life activities. Individuals with OA 58.3% of used pain medication when they had pain, 17.6% of them experienced blunt pressure pain, 44.8% of their DLA were limited due to pain and 36.6% of them had low physical activity level (600 MET<) level has been determined (Table 1).

VAS-P, WOMAC AND TSK SCALES

Table 2 shows the scores of individuals with OA from the VAS-P, WOMAC and TSK scales. In the study, the mean VAS scores of individuals with OA were 5.23±1.52, WOMAC pain 7.01±4.21, WOMAC stiffness 3.58±1.78, WOMAC physical function 23.32±13.41, WOMAC total 33.92±18.29 and TSK mean scores were 45.27±8.61.

TABLE 1: Characteristics of the patients (n=290).

Characteristics of the patients	n	%
Age (Mean±SD)	59.86±15.64	
35-64	169	58.3
≥65	121	41.7
Body Mass Index		
Normal	90	31.0
Pre-obese	100	34.5
Obese	100	34.5
Gender		
Female	178	61.4
Male	112	38.6
Marital status		
Married	229	79.0
Single	61	21.0
Education level		
Not literate	45	15.5
Literate	66	22.8
Primary school	106	36.6
High school	52	17.9
University	21	7.2
Living place		
City	162	55.8
County	48	16.6
Village	80	27.6
Profession		
Officer	25	8.6
Housewife	151	52.1
Worker	29	10.0
Retired	64	22.1
Artificer	21	7.2
Working status		
Not working	217	74.8
Full day	61	21.1
Half day	12	4.1
Income level		
Good	110	37.9
Middle	169	58.3
Bad	11	3.8
Chronic disease		
Yes	136	46.9
No	154	53.1
Exercise		
Doing	42	14.5
Does not	248	85.5
ID-status		
Dependent	8	2.7
Semi dependent	64	22.1
Independent	218	75.2
Utility vehicle		
No	215	74.1
Walking stick	55	19.0
Crutches	11	3.8
Walking stick. Crutches. Walker	9	3.1

devamı →

TABLE 1: Characteristics of the patients (n=290) *(devamı)*.

Characteristics of the patients	n	%
A history of trauma		
There is	37	12.8
No	253	87.2
DLA affected by pain		
No	22	7.6
Mild	130	44.8
Moderate	103	35.5
Severe	35	12.1
Type of pain		
Burning	28	9.7
Stinging	46	15.6
Throbbing	44	15.2
Sharp	26	9.1
Blunt pressure	51	17.6
Stinging. throbbing	47	16.2
Burning. Stinging. Throbbing.	48	16.6
Analgesic use		
Yes	121	41.7
No	169	58.3
Physical activity level		
Low (<600 MET)	106	36.6
Medium (600-2,999 MET)	88	30.3
High (3,000 MET<)	96	33.1

SD: Standard deviation; DLA: Daily life activities.

TABLE 2: VAS-P, WOMAC and Tampa Scale for Kinesiophobia.

Scales	Mean±SD
VAS-P	5.23±1.52
WOMAC pain	7.01±4.21
WOMAC stiffness	3.58±1.78
WOMAC physical function	23.32±13.41
WOMAC total	33.92±18.29
TSK	45.27±8.61

SD: Standard deviation; VAS-P: Visual Analogue Scale-Pain; WOMAC: The Western Ontario and McMaster Universities; TSK: Tampa Scale for Kinesiophobia.

The mean scores of individuals aged 65 and over for VAS-P, WOMAC total and all sub-dimensions and TSK are higher than individuals under 65 and the difference is significant except for WOMAC stiffness and TSK scores ($p<0.05$). Obese individuals have higher mean scores for VAS-P, WOMAC total and all sub-dimensions and TSK than other individuals, and the difference is significant except for WOMAC stiffness ($p<0.05$). The mean scores of women for VAS-P, WOMAC total and all sub-dimensions and TSK are higher than men, and the difference is significant for VAS-P (0.003) and WOMAC stiffness (0.014). Compared to married people, single individuals have higher mean scores for VAS-P, WOMAC total and all sub-dimensions and TSK, and the difference is significant except for WOMAC stiffness and TSK scores ($p<0.05$). Illiterate individuals have higher mean scores for VAS-P, WOMAC total and all sub-dimensions and TSK than other groups and WOMAC is significant except pain ($p<0.05$). VAS-P, WOMAC total and all sub-dimensions and score averages of the individuals living in the village are higher than those living in the province and district, meaningful for VAS-P (0.012), WOMAC stiffness (0.019) and TSK (<0.001). The mean scores of the housewife and non-working individuals for VAS-P, WOMAC total and all sub-dimensions and TSK are higher than other groups, and WOMAC is significant except for pain ($p<0.05$). VAS-P, WOMAC total and all sub-dimensions of individuals with moderate income levels, and TSK scores of individuals with poor income levels are higher than other groups, the difference is significant for VAS-P (0.023), WOMAC stiffness (0.014) and TSK (0.001).

Individuals with a chronic disease other than OA have higher VAS-P, WOMAC total and all sub-dimensions and TSK scores, and the difference is significant for other scales except for the TSK scores ($p<0.05$). VAS-P and WOMAC pain scores of individuals exercising, WOMAC stiffness, function, total and TSK scores of individuals who do not exercise are higher. The difference is meaningful for VAS-P ($p<0.05$). Except for the WOMAC pain score of dependent individuals in DLA, VAS-P, WOMAC and TSK scores are higher and the difference is significant for VAS-P, WOMAC and TSK ($p<0.05$). VAS-P, WOMAC and TSK scores of individuals using crutches as an auxiliary device are higher than other groups and the difference is significant for VAS-P, WOMAC and TSK ($p<0.05$). Individuals with a history of trauma have higher VAS-P, WOMAC and TSK scores than those without, the difference is significant for other scales except for WOMAC stiffness and total scores ($p<0.05$). The individuals who use

pain medication for pain have higher VAS-P, WOMAC total and all sub-dimensions and TSK scores, and the difference is significant for other scales except for TSK scores ($p<0.05$) (Table 3).

RESULTS OF THE CORRELATIONS BETWEEN VAS-P, WOMAC AND TSK SCALES

When the scores of individuals with OA on VAS-P, WOMAC, TSK, IPAQ scales and Body Mass Index

TABLE 3: Characteristics of the patients and VAS-P, WOMAC ve TSK scores.

Characteristics of the patients	VAS-P	WOMAC Pain	WOMAC Stiffness	WOMAC Function	WOMAC Total	TSK
Age						
35-64	4.79±1.24	6.13±3.23	3.18±1.66	19.16±9.84	28.47±13.37	42.50±7.78
≥65	5.84±1.66	8.24±5.04	4.13±1.81	29.10±15.46	41.48±21.34	49.14±8.25
Test and	t=-6.12	t=-4.35	t=-4.58	t=-6.67	t=-6.35	t=-6.99
p value	<0.001	0.000	0.368	<0.001	<0.001	0.450
BMI						
Normal	4.73±1.01	6.03±3.18	3.41±1.83	20.97±11.57	30.42±15.66	44.06±8.75
Pre-obese	5.21±1.50	6.87±4.28	3.41±1.71	22.11±12.75	32.39±17.57	44.40±8.43
Obese	5.71±1.75	8.04±4.72	3.91±1.78	26.68±15.00	38.65±20.31	47.24±8.41
Test and	F=10.43	F=5.64	F=2.58	F=5.03	F=5.47	F=4.08
p value	<0.001	0.004	0.077	0.007	0.005	0.018
Gender						
Female	5.32±1.62	7.24±3.98	3.59±1.90	23.79±13.46	34.63±18.14	45.51±8.98
Male	5.09±1.33	6.65±4.54	3.56±1.58	22.58±13.36	32.80±18.56	44.90±8.03
Test and	t=-1.21	t=-1.16	t=-0.15	t=-0.74	t=-0.82	t=-0.58
p value	0.003	0.571	0.014	0.170	0.292	0.286
Marital status						
Single	5.59±1.74	8.59±4.93	3.65±2.06	28.04±15.39	40.29±21.39	46.75±9.73
Married	5.13±1.44	6.59±3.90	3.56±1.70	22.06±12.57	32.21±17.03	44.88±8.27
Test and	t=2.06	t=3.34	t=0.35	t=3.14	t=3.10	t=1.51
p value	<0.001	0.003	0.077	0.013	0.005	0.072
Education L.						
Not literate	6.00±1.84	7.73±4.06	4.82±1.65	30.20±13.37	42.75±18.11	49.75±7.23
Literate	5.25±1.62	7.66±5.10	3.84±1.66	23.90±14.53	35.42±19.95	48.48±7.24
Primary school	5.31±1.43	6.96±3.94	3.46±1.65	23.16±12.93	33.59±17.49	44.40±8.69
High school	4.76±1.16	6.13±3.98	2.84±1.75	18.80±12.57	27.76±17.39	41.36±7.89
University	4.28±0.56	5.85±2.65	2.52±1.60	18.52±7.42	26.90±10.57	39.66±8.67
Test and	F=6.67	F=1.70	F=11.38	F=5.42	F=5.24	F=12.11
p value	<0.001	0.148	<0.001	<0.001	<0.001	<0.001
Living place						
City	5.03±1.26	6.93±3.90	3.32±1.68	22.33±12.89	32.59±17.45	43.23±8.63
County	5.20±1.72	6.39±4.52	3.89±1.75	23.54±13.10	33.83±18.13	47.27±6.42
Village	5.65±1.78	7.53±4.59	3.92±1.93	25.18±14.56	36.65±19.92	48.21±8.69
Test and	F=4.46	F=1.16	F=4.02	F=1.21	F=1.31	F=11.21
p value	0.012	0.314	0.019	0.298	0.270	<0.001
Profession						
Officer	4.28±0.54	4.88±2.52	3.40±1.52	17.32±6.65	25.60±9.10	38.80±5.55
Housewife	5.44±1.68	7.35±4.10	3.84±1.85	24.98±13.79	36.18±18.62	46.23±9.03
Worker	5.20±0.97	7.17±2.49	3.27±1.57	21.27±7.81	31.72±11.10	44.75±8.17
Retired	5.35±1.50	7.01±5.34	3.65±1.66	24.82±15.61	35.50±21.83	46.53±8.06
Artificer	4.52±1.12	6.85±4.12	2.14±1.52	16.90±12.08	21.83±16.03	43.00±7.47
Test and	F=4.66	F=1.89	F=4.73	F=3.51	F=3.19	F=4.98
p value	0.001	0.111	0.001	0.008	0.014	0.001

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TABLE 3: Characteristics of the patients and VAS-P, WOMAC ve TSK scores *(devamı)*.

Characteristics of the patients	VAS-P	WOMAC Pain	WOMAC Stiffness	WOMAC Function	WOMAC Total	TSK
Working status						
Not working	5.43±1.64	7.35±4.54	3.83±1.79	25.16±14.45	36.35±19.75	46.47±8.85
Full day	4.55±.78	6.14±2.85	2.95±1.49	18.18±7.75	27.27±10.26	41.45±6.99
Half day	5.08±.90	5.33±2.42	2.16±1.64	16.41±6.21	23.91±9.63	43.08±5.56
Test and	F=8.36	F=2.97	F=10.45	F=8.52	F=8.10	F=8.91
p value	<0.001	0.052	<0.001	<0.001	<0.001	<0.001
Income level						
Good	4.92±1.35	6.67±3.97	3.21±1.69	21.52±13.17	31.41±17.60	43.00±8.36
Middle	5.43±1.59	7.23±4.32	3.84±1.80	24.65±13.55	35.72±18.63	46.53±8.42
Bad	5.18±1.53	7.09±4.90	3.27±1.90	20.81±12.31	31.18±18.15	48.63±9.82
Test and	F=3.83	F=0.58	F=4.30	F=2.01	F=1.97	F=6.69
p value	0.023	0.558	0.014	0.135	0.140	0.001
Chronic disease						
Yes	5.80±1.71	8.50±4.95	4.09±1.91	27.77±15.10	40.37±20.70	48.54±8.07
No	4.72±1.09	5.70±2.84	3.12±1.53	19.36±10.24	28.18±13.53	42.38±8.05
Test and	t=6.45	t=5.97	t=4.76	t=5.59	t=5.98	t=6.48
p value	<0.001	<0.001	0.003	<0.001	<0.001	0.829
Exercise						
Doing	5.47±1.78	7.33±4.33	3.38±1.89	22.42±13.07	33.14±18.21	40.71±9.12
Does not	5.19±1.47	6.95±4.19	3.61±1.76	23.47±13.49	34.05±18.34	46.04±8.30
Test and	t=1.11	t=0.53	t=-0.79	t=-0.46	t=-0.29	t=-3.79
p value	0.034	0.584	0.487	0.667	0.949	0.355
ID-status						
Dependent	7.50±2.20	10.25±5.11	6.25±1.58	42.50±15.02	59.00±20.70	55.62±5.95
Semi dependent	6.78±1.45	11.42±4.95	5.01±1.71	38.01±13.64	54.45±18.77	52.95±6.57
Independent	4.69±1.06	5.60±2.74	3.06±1.47	18.28±8.68	26.94±11.51	42.64±7.54
Test and	F=89.77	F=75.20	F=52.45	F=107.58	F=113.01	F=57.49
p value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Utility vehicle						
No	4.67±1.01	5.73±2.92	3.05±1.46	18.55±9.05	27.33±12.06	42.71±7.71
Walking stick	6.49±1.45	9.32±4.38	5.01±1.72	33.36±13.13	47.70±17.83	52.03±6.51
Crutches	8.45±0.82	18.00±2.44	5.36±1.43	55.00±7.75	78.36±10.68	56.18±4.66
WS-C-W	6.88±2.08	10.11±4.04	5.33±2.39	36.66±13.33	52.11±18.18	51.88±8.72
Test and	F=73.95	F=64.18	F=32.87	F=76.00	F=81.22	F=33.88
p value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
H. trauma						
There is	6.08±1.87	9.29±3.91	4.45±2.06	28.51±15.68	42.27±20.21	49.18±6.50
No	5.11±1.42	6.67±4.15	3.45±1.70	22.56±12.91	32.69±17.71	44.70±8.75
Test and	t=3.70	t=3.60	t=3.24	t=2.54	t=3.01	t=2.99
p value	<0.001	0.877	0.018	0.033	0.085	0.020
DLA-pain						
No	4.18±0.39	6.50±3.29	2.68±1.24	17.81±10.50	27.00±14.38	39.50±4.55
Mild	4.33±0.62	4.66±2.29	2.73±1.44	16.13±8.05	23.52±10.29	41.73±8.24
Moderate	5.57±1.12	7.97±3.66	4.15±1.59	26.37±11.28	38.50±15.03	47.96±7.18
Severe	8.22±0.94	13.22±4.49	5.60±1.45	44.28±11.58	63.11±15.78	54.17±5.69
Test and	F=202.61	F=69.79	F=42.99	F=79.74	F=90.24	F=35.96
p value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

devamı →

TABLE 3: Characteristics of the patients and VAS-P, WOMAC ve TSK scores *(devamı)*.

Characteristics of the patients	VAS-P	WOMAC Pain	Stiffness	Function	Total	TSK
Type of pain						
Burning	5.14±1.81	7.92±3.47	2.71±1.46	20.25±9.20	30.89±12.68	43.57±6.11
Stinging	4.52±.83	5.95±3.38	2.65±1.60	19.56±12.88	28.17±16.79	43.82±8.38
Throbbing	5.18±1.35	7.04±4.38	3.09±1.61	22.63±13.49	32.77±18.34	44.27±8.53
Sharp	7.07±1.57	12.92±5.62	4.46±1.77	41.11±16.53	58.50±23.09	53.03±7.82
Blunt pressure	5.27±1.34	7.94±3.75	3.37±1.76	24.29±14.57	35.60±19.52	43.13±9.52
Two types- pain	4.48±.71	4.42±1.41	4.29±1.28	19.17±5.70	27.86±7.38	45.14±6.63
Threetypes-pain	5.70±1.74	5.81±3.12	4.47±1.90	22.66±10.63	32.95±15.05	46.77±9.14
Test and	F=13.53	F=17.91	F=9.63	F=11.26	F=11.84	F=5.19
p value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Analgesic use						
Yes	6.23±1.70	9.61±4.74	4.11±2.02	31.61±14.99	45.34±20.45	49.32±8.32
No	4.52±.82	5.14±2.45	3.20±1.48	17.35±7.95	25.69±10.68	42.37±7.61
Test and	t=11.34	t=10.45	t=4.43	t=10.45	t=10.60	t=7.36
p value	<0.001	<0.001	<0.001	<0.001	<0.001	0.383

BMI: Body Mass Index; Education L: Education level; ID status: Independence status; WS-C-W: Walking stick. Crutches. Walker; H. Trauma: A history of trauma; DLA-pain: Daily Life Activity affected by pain; Two types of pain: Stinging. Throbbing; Three types of pain: Burning. Stinging. Throbbing; t: Independent t test; F: Anova test.

(BMI) correlation were examined; it was found that there was a positive correlation between VAS-P, WOMAC pain, stiffness, physical function and total scores, and BMI and TSK scores, as well as a very high positive correlation between WOMAC pain, physical function and total scores and VAS-P scores ($p<0.05$), a significant relationship was found between IPAQ and WOMAC only stiffness (Table 4).

The coefficient of determination ($R^2=0.238$) shows that pain explained 24% of the variation on kinesiophobia, that is, people who are experiencing pain are more likely to be kinesiophobia.

DISCUSSION

There is evidence that the degree of pain and disability in individuals with knee OA is associated with structural damage, peripheral and central pain mechanisms, obesity, culture and psychological factors as well as demographic factors.[2] Kinesiophobia is among the conditions that cause fear of pain due to movement or re-injury. In chronic cases, pain severity and responses to pain are associated with functional impairment.[15]

Fear of movement has been associated with symptoms such as pain and physical disability for individuals with OA.[16] Individuals with OA can avoid physical activity due to pain during activity.[17] While some studies on the subject were reported to have moderate kinesiophobia levels in individuals with OA, in some studies the level of kinesiophobia was found to be high.[9,17,18] In our study, the levels of kinesiophobia of individuals with OA were found to be high and it was observed that factors such as female gender, being single, exercise/not doing exercise, and pain medication use did not affect kinesiophobia. In previous studies, it was emphasized that there was no difference between the genders in terms of kinesiophobia scores.[9,17,19] Odele et al., stated that pain, physical function, pain catastrophobia and self-efficacy do not differ between genders in individuals with OA.[19] In the study, it was observed that VAS-P, WOMAC and TSK scores of women were higher among individuals with OA than men, the difference was not significant for pain and stiffness and not for physical function. This result can be explained by these neural and psychosocial factors, or by decreasing estrogen levels that protect the musculoskeletal system especially in post-menopausal women.[20]

Kinesiophobia and pain negatively affect a person's ability to perform daily life activities.[17,18,21,22] In

TABLE 4: Correlation of VAS-P, WOMAC, TSK, BMI and IPAQ scores.

	VAS-P	WOMAC pain	WOMAC stiffness	WOMAC physical function	WOMAC total	TSK	BMI	IPAQ
VAS-P	1	r=0.713	r=0.547	r=0.755	r=0.772	r=0.488	r=0.259	r=-0.045
		p=<0.001	p=<0.001	p=<0.001	p=<0.001	p=<0.001	p=<0.001	p=0.442
WOMAC pain	r=0.713	1	r=0.456	r=0.843	r=0.894	r=0.540	r=0.219	r=0.004
	p=<0.001		p=<0.001	p=<0.001	p=<0.001	p=<0.001	p=<0.001	p=0.940
WOMAC stiffness	r=0.547	r=0.456	1	r=0.655	r=0.683	r=0.466	r=0.135	r=-0.123
	p=<0.001	p=<0.001		p=<0.001	p=<0.001	p=<0.001	p=0.022	p=0.036
WOMAC physical function	r=0.755	r=0.843	r=0.655	1	r=0.992	r=0.559	r=0.224	r=-0.074
	p=<0.001	p=<0.001	p=<0.001		p= <0.001	p=<0.001	p=<0.001	p=0.207
WOMAC total	r=0.772	r=0.894	r=0.683	r=0.992	1	r=0.580	r=0.228	r=-0.066
	p=<0.001	p=<0.001	p=<0.001	p=<0.001		p=<0.001	p=<0.001	p=0.267
TSK	r=0.488	r=0.540	r=0.466	r=0.559	r=0.580	1	r=0.155	r=-0.061
	p=<0.001	p=<0.001	p=<0.001	p=<0.001	p=<0.001		p=0.008	p=0.299

VAS-P: Visual Analogue Scale-Pain; WOMAC: The Western Ontario and McMaster Universities; TSK: Tampa Scale for Kinesiophobia; BMI: Body Mass Index; IPAQ: International Physical Activity Questionnaire.

this study, people who reported that pain restricted DLA very much, TSK scores were found significantly higher. A moderately significant relationship was found between kinesiophobia and pain. In previous studies, a significant relationship was found between pain, kinesiophobia and physical function.[19,22] In the study, a moderately significant relationship was found between kinesiophobia and physical function, and the results are similar to those of in previous studies. Again, in the study, a moderate positive relationship was found between kinesiophobia and WOMAC scores, and the results are similar to those of Alaca. In line with these results, what patients have done to avoid pain or limitation; it is advocated that the behavior limiting behavior can increase the severity of the disease.[18]

Individuals with OA 36.6% of who participated in the study were found to have low physical activity levels, while Kilinç et al. reported that the level of physical activity of individuals with OA was moderate.[9] When the relationship between physical activity and pain and kinesiophobia was examined, no significant relationship was found, and it was found that the relationship was significant only for WOMAC stiffness. Kilinç et al., emphasized that pain is an important predictor of physical activity.[9]

BMI, being single, presence of chronic disease, state of independence of DLA, use of auxiliary devices, pain level of efficacy of DLA, use of painkillers and type of pain; VAS-P and WOMAC have been identified as important factors affecting pain. It is emphasized that demographic variables (age, gender) and medical condition variables (disease severity and BMI) are generally important factors explaining pain in OA patients. (Alaca, 2019). In our study, pain levels of individuals 65 years and older were found to be significantly higher. Obesity is common in OA patients and causes both the development and progression of the disease (Somers et al, 2009). Those who are overweight (BMI=25-29) or obese (BMI=30) are more likely to feel a higher level of pain.[18] It was observed that low BMI individuals felt low and high BMI individuals felt higher pain.[7] In the study, a positive correlation was found between BMI and VAS-P and WOMAC pain. Studies show that, similar to the current study results, older age and BMI are associated with pain and physical disability.[2,7,18]

OA is rarely seen under the age of 40 and is mostly seen in individuals over the age of 60.[5] In the study, 41.7% of individuals are 65 years and older. The mean scores of individuals aged 65 and over for VAS-P, WOMAC total and all sub-dimensions and TSK are higher than individuals under 65. Increasing the number of impaired joints with age explains these results.[5]

Epidemiological data show that, depending on the obesity and knee OA pathogenic phenotypes are the same, the development of one disease increases

the risk of another and a vicious circle begins between them.[20,23] It is suggested that obesity is a predisposing factor in pain increase and indirectly affects kinesiophobia.[15] When the participants' BMI was examined, it was seen that VAS-P, WOMAC and TSK scores of obese individuals were higher and there was a significant relationship between BMI and VAS-P, WOMAC and TSK scores. No significant relationship was found between BMI and pain and kinesiophobia.[24]

LIMITATIONS OF THE RESEARCH

The fact that the study was carried out in a single center is among the limitations of our study.

CONCLUSION

It was determined that VAS-P, WOMAC and TSK scores of individuals with OA were above average, being female gender, marital status, presence of chronic disease, and the use of painkillers were important factors affecting pain, physical function and kinesiophobia. In line with these results, nurses' determination of pain and kinesiophobia levels of individuals with OA will enable more effective planning of the nursing care for kinesiophobia, which causes individuals to avoid exercising but worsen their clinical status. It can be recommended to educate and advise both colleagues and patients about kinesiophobia and to raise awareness on the subject and encourage them to exercise more.

More than half of the individuals had low and moderate levels of physical activity. Decreased activity can cause further aggravation of existing pain and, consequently, activity restriction in a vicious circle. The limitation of individuals' daily activities can be associated with pain severity and physical disability. Inactivity further increases pain and causes a decrease in physical activities, difficulties in coping with pain, job loss and increases the need for care of the individual. There is a strong correlation between a person's pain and functional disability. More comprehensive and high-level studies are needed on this subject.

CONTRIBUTION OF THE RESEARCH TO DAILY PRACTICE

Obese individuals, those who are illiterate, live in the village, retired and housewives, do not work, report poor income, have chronic disease, do not exercise, depend on DLA, use crutches, have previously traumatized and severely restrain pain. Kinesiophobia levels were higher. Therefore, these risky groups that restrict their movements with the fear of experiencing pain may be encouraged to turn towards effective physical activity.

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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: *Nurhan Doğan;* ***Design:*** *Nurhan Doğan, Sultan Taşcı;* ***Control/Supervision:*** *Nurhan Doğan, Sultan Taşcı;* ***Data Collection and/or Processing:*** *Nurhan Doğan;* ***Analysis and/or Interpretation:*** *Nurhan Doğan;* ***Literature Review:*** *Nurhan Doğan;* ***Writing the Article:*** *Nurhan Doğan, Sultan Taşcı;* ***Critical Review:*** *Sultan Taşcı;* ***References and Fundings:*** *Nurhan Doğan.*

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