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RESEARCH

DETERMINANTS OF QUALITY OF LIFE IN WOMEN WITH SYMPTOMATIC KNEE OSTEOARTHRITIS: THE ROLE OF FUNCTIONAL AND EMOTIONAL STATUS

ABSTRACT

Introduction: Osteoarthritis (OA) is a chronic disease that causes impairment in quality of life. The aim of this study was to investigate the factors which determine the quality of life in women with symptomatic knee OA.

Materials and Method: Seventy-five women with symptomatic knee OA were included in the study. Short form 36 (SF-36) was used for the assessment of quality of life. Patients were evaluated with the Western Ontario and McMaster Universities (WOMAC) OA index, Timed Up and Go (TUG) test, and Hospital Anxiety and Depression Scale (HADS).

Results: Mean age was 66.1 (SD=10.5) and duration of disease was 8.9 (SD=7.1) years. Statistically significant correlations existed between SF-36 and age, TUG, radiological severity, WOMAC and HADS (p<0.05). In multiple linear regression analysis, WOMAC function (p<0.001 b1= -0.752) and HADS depression (p<0.001 b1= -1.499 R2=0.590) scores were statistically significant in the prediction of quality of life.

Conclusion: In this study, functional status and depressive mood were found to be two of the main factors determining the quality of life in women with symptomatic knee OA. Multidisciplinary approaches comprising psychological treatment strategies along with treatments targeting pain, stiffness, and functional status of the patients could be beneficial to improve the quality of life in knee OA.

Key Words: Pain, Depression, Osteoarthritis, Knee; Quality of Life.

ARAŞTIRMA

SEMPTOMATİK DİZ OSTEOARTRİTİ OLAN KADINLARDA YAŞAM KALITESİNİ BELİRLEYEN FAKTÖRLER: FONKSİYONEL VE EMOSYONEL DURUMUN ROLÜ

ÖZ

Giriş: Osteoartrit (OA) yaşam kalitesinde bozulmaya yol açan kronik bir hastalıktır. Bu çalışmanın amacı semptomatik diz OA'sı olan kadınlarda yaşam kalitesini belirleyen faktörlerin araştırılmasıdır.

Gereç ve Yöntem: Çalışmaya semptomatik diz OA'sı olan 75 kadın hasta alındı. Yaşam kalitesi Kısa Form 36 (SF-36) ile araştırıldı. Hastaların tamamında Western Ontario and McMaster Universities (WOMAC) osteoartrit indeksi, zamanlı kalk ve yürü (TUG) testi ve Hastane Anksiyete ve Depresyon Skalası (HADS) kullanıldı.

Bulgular: Ortalama yaş 66.1 (SS=10.5), hastalık süresi 8.9 (SS=7.1) yıl idi. SF-36 ile yaş, TUG, diz OA'sının radyolojik şiddeti, WOMAC ve HADS arasında istatistiksel olarak anlamlı ilişki olduğu saptanmıştır (p<0.05). Multipl lineer regresyon analizinde WOMAC fonksiyon (p<0.001 b1= -0.752) ve HADS depresyon (p<0.001 b1= -1.499 R2=0.590) yaşam kalitesinin belirlenmesinde istatistiksel olarak anlamlı bulunmuştur.

Sonuç: Bu çalışmada semptomatik diz OA'sı olan kadınlarda yaşam kalitesini belirleyen faktörlerden ikisinin fonksiyonel durum ve depresif ruh hali olduğu bulunmuştur. Diz OA'sında ağrı, eklem sertliği ve fonksiyonel duruma yönelik tedavilerin yanında psikolojik tedavi yöntemlerini de içeren multidisipliner yaklaşımlar yaşam kalitesini artırmak açısından yararlı olabilir.

Anahtar Sözcükler: Ağrı, Depresyon, Diz Osteoartriti, Yaşam Kalitesi.

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INTRODUCTION

Osteoarthritis (OA) is the most common form of arthritis worldwide. Knee OA has the highest incidence and it is the most painful OA (1). A study carried out in Turkey reported that the prevalence of symptomatic knee OA was 14.8% (2). Female gender is thought to be a risk factor for knee OA (1, 2). In a previous study, the prevalence of symptomatic knee OA was reported to be 11.4% in females and 6.8% in males (3).

Lower extremity OA leads to an impairment in the quality of life (4-6). General health status among elderly patients without hip or knee pain was similar to that in younger people according to a previous study (7). Hip or knee problems may cause impairment in symptoms and physical functioning areas of the quality of life (8, 9).

Disability and depression may develop in patients with knee OA because of pain (10). It was reported that pain caused by OA plays a determinant role in poor general health perception in knee OA (11). Age, level of education, low income, severity of OA, number of co-morbid conditions, and female gender had negative effects on quality of life in subjects with OA (4-6, 12, 13).

The aim of this study was to investigate the factors which determine the quality of life in women with symptomatic knee OA. Our hypothesis was that pain, functional status and mood disorders may be related with the quality of life in patients with knee OA.

MATERIALS AND METHOD

A total of 75 women who were diagnosed as knee OA according to the criteria of the American College of Rheumatology (ACR) were included in the present cross-sectional study. Patients suffering from pain for < 1 year or those with a history of previous knee surgery or collagen tissue disease, such as rheumatoid arthritis, psychiatric diseases and communication problems were not included in the study. The level of education, co-morbid diseases, body mass index (BMI), and duration of disease of the patients were determined. Knee radiographs were evaluated by the Kellgren-Lawrence grading scale.

Measurements

Short Form 36 (SF-36)

SF-36 health survey is a self-assessment questionnaire that helps to evaluate the physical and mental health. SF-36 con-sists of 8 subscales and a total of 36 questions. Total score changes between 0-100. High scores indicate better quality of life. The reliability and validity of the Turkish version of SF-36 has been studied (14).

Western Ontario and McMaster Universities (WOMAC) OA Index

Western Ontario and McMaster Universities (WOMAC) OA index is a self-reported questionnaire that is used to evaluate pain, stiffness, and the impact on physical functioning caused by knee OA.

Timed Up and Go (TUG) Test

Timed Up and Go (TUG) test helps to measure functional mobility. First, the patients were seated on a chair with back support and a line was drawn on the floor 3 meters away from the chair. Then, the patients were instructed to stand up, walk to the line on the floor, turn around, and walk back to the chair and sit down. Following the practice trial, three measurements were obtained and the average was recorded. The performance was measured in seconds. All tests were performed by the same physician.

Hospital Anxiety and Depression Scale (HADS)

The depression and anxiety status of the patients were assessed by the Hospital Anxiety and Depression Scale (HADS). HADS is a short test with 2 subscales each consisting of 7 items, used to determine clinical anxiety and depression. The scale gives maximum 21 scores for both anxiety and depression. Scores between 0-7 are considered normal, scores between 8-10 shows borderline and $\geq$ 11 indicates mood disorder (15). A study conducted in patients with a musculoskeletal disorder supported the two factor structure of HADS representing depression and anxiety (16). Validity and reliability of Turkish version of HADS has been studied (17).

This study was approved by the Hospital Ethics Committee.

Statistical Analysis

SPSS 12.0 for Windows was used for all statistical analyses. Descriptive statistics were performed for numeric variables. Examination of the correlations between clinical findings, TUG test, Kellgren-Lawrence radiologic grading scale of OA, SF-36, WOMAC area scores, and HADS anxiety and depression scores revealed that the data did not show normal distribution. Therefore, Spearman's correlation test was used. In a linear regression model, each of the SF-36 area scores were

Table 1— Demographic and Clinical Features

Demographic Features	Mean±sd	Min-Max
Age (years)	66.1 ± 10.5	48-87
BMI (kg/m²)	32.9 ± 4.3	24.3-44.2
Disease Duration (years)	8.9± 7.1	1-40
Education, n (%)		
≥ 8 years	72 (96%)	
< 8 years	3 (4%)	

Sd: Standard Deviation.

Table 2— Physical and Self-Reported Measures in the Patient Group

Physical and Self-Report Measures	Mean ± sd	Min-Max
Knee Flexion-extension Angle (°)	111.9 ± 10.7	90-140
TUG test (sec)	17.6 ± 7.2	7-43
WOMAC		
Pain	14.5 ± 4.1	5-23
Stiffness	5.7 ± 1.7	2-9
Function	53.0 ± 10.7	28-75
Total Score	73.3 ± 7.2	30-45
HADS		
Anxiety	9.0 ± 3.6	0-21
Depression	10.5 ± 3.7	0-21

TUG: Timed Up and Go; WOMAC: Western Ontario Mc Master
Universities, HADS: Hospital Anxiety and Depression Scale.

examined for their association with other variables using the backward selection method and the most significant models were indicated. The statistical level of significance was accepted as p<0.05. The results were presented as regression coefficients (β).

RESULTS

The demographic and clinical features of the study group are summarized in Table 1. All the patients had complaints involving both knees. The radiologic severity of knee OA was determined as Kellgren-Lawrence stage 2 in 16 patients (21.3%), stage 3 in 47 patients (62.7 %), and stage 4 in 12 patients (16 %). Co-morbidity rate was 80% (n: 60) in the study group. The incidence of co-morbidities was hypertension and coronary artery disease (n: 59), diabetes mellitus (n:11), osteoporosis (n: 8), pulmonary disease (n: 2), and gastrointestinal disease (n: 2). There was only one co-morbidity in 28 patients, however, there were 2 or more co-morbidities in 32 patients. TUG, WOMAC, and HADS scores are summarized in Table 2. Twenty-four (32%) patients had anxiety disorders and 34 (45.3%) had clinical depression.

The correlations between SF-36 and age, radiological severity, TUG test, pain, stiffness, function, total scores of WOMAC, anxiety, and depression are summarized in Table 4. Statistically significant associations were found between physical components, mental components, and total scores of SF-36, and age, TUG test, the radiological stage of knee OA, pain, stiffness, function, total scores of WOMAC, and HADS anxiety and depression scores (p<0.05).

According to multiple linear regression analysis, WOMAC function and HADS depression scores were the strongest predictors for total, physical, and mental component scores of SF-36 (Table 5).

Table 3— SF-36 Scores of the Patients

SF-36 scores	Mean ±sd	Min-Max
Physical Functioning	22.0 ±23.1	0-100
Physical Role Limitation	10.3 ±27.9	0-100
Pain	34.7 ±15.8	0-74
General Health	47.3± 21.9	0-87
Vitality	34.1 ±17.4	5-85
Social Functioning	45.1 ±22.2	0-100
Emotional Role Limitation	21.8 ±39.3	0-100
Mental Health	55.8 ±9.8	32-76
Physical Component	29.5 ±15.6	4-75
Mental Component	40.8 ±15.8	14-80
Total	33.9 ±15.4	9-74

Sd: Standard deviation.

DISCUSSION

According to the results of the current study, the impairment in the quality of life of women with knee OA was more prominent in the area of physical health than in mental health. In the study group, the most affected area of quality of life was physical role limitations. The highest quality of life scores for the study patients with knee OA were those in the area of mental health. Physical health is frequently impaired while mental health area is preserved in lower extremity OA. In a longitudinal study of 1072 patients with hip or knee OA conducted by Dawson et al. (18), patients with persistent pain were reported to have marked impairment in all areas of the quality of life, as measured by SF-36, except the area of mental health.

Table 4— Correlation Coefficients (Spearman's r) for SF-36

	Age	TUG	Kellgren Score	WOMAC Pain	WOMAC Stiffness	WOMAC Function	WOMAC Total	HADS Anxiety	HADS Depression
Physical Functioning	-0.205	-0.451**	-0.364**	-0.423**	-0.319**	-0.485**	-0.493**	-0.188	-0.315**
Pain	-0.245*	-0.476**	-0.186	-0.606**	-0.359**	-0.550**	-0.573**	-0.363**	-0.366**
General Health	-0.180	-0.385**	-0.118	-0.476**	-0.236*	-0.529**	-0.529**	-0.431**	-0.463**
Vitality	-0.272*	-0.422**	-0.193	-0.456**	-0.372**	-0.526**	-0.519**	-0.434**	-0.633**
Social Functioning	-0.335*	-0.361**	-0.260*	-0.592**	-0.301**	-0.522**	-0.543**	-0.262*	-0.455**
Role-Physical	0.062	-0.168	-0.163	-0.383**	-0.301**	-0.348**	-0.386**	-0.225	-0.451**
Role-emotional	-0.028	-0.232*	-0.179	-0.418**	-0.391**	-0.348**	-0.399**	-0.234*	-0.431**
Mental Health	-0.148	-0.110	-0.042	-0.284*	-0.087	-0.239*	-0.252*	-0.451**	-0.214
Physical Component	-0.249*	-0.515**	-0.230*	-0.629**	-0.396**	-0.654**	-0.672**	-0.473**	-0.622**
Mental Component	-0.233*	-0.423**	-0.228*	-0.618**	-0.386**	-0.597**	-0.621**	-0.466**	-0.615**
Total Score	-0.248*	-0.472**	-0.256**	-0.651**	-0.417**	-0.631**	-0.658**	-0.441**	-0.600**

*Significant p<0.05, **Significant p<0.01; TUG: Timed Up and Go; WOMAC: Western Ontario Mc Master Universities; HADS: Hospital Anxiety and Depression Scale.

Table 5— Multiple Linear Regression Analysis for SF-36

	R2	β1	p	R
SF-36 Physical Component				
WOMAC Function	0.584	-0.805	<0.001	0.764
HADS Depression		-1.353	0.001	
SF-36 Mental Component				
WOMAC Function	0.568	-0.641	<0.001	0.754
HADS Depression		-1.834	<0.001	
SF-36 Total				
WOMAC Function	0.590	-0.752	<0.001	0.768
HADS Depression		-1.499	<0.001	

SF-36: Short Form 36; WOMAC: Western Ontario Mc Master Universities; HADS: Hospital Anxiety and Depression Scale

In their studies, Salaffi et al. (5,6) reported that symptomatic hip or knee OA led to an impairment in the quality of life and that the areas of physical functioning, physical role, and pain were particularly affected and the impairment in the physical health component was more prominent than in the mental health component. Dijk et al. (19) found that the score from the physical health area of the SF-36 in patients with knee OA was less than that of the general population in the Netherlands.

In the present study, functional status and depression were found to be the most significant variables in determining the quality of life in patients with knee OA. In addition, functional status and depression were demonstrated to be indicators of physical and mental components, of quality of life.

Maly et al. (20), in their study in 54 patients with knee OA, suggested that pain, depression, and quadriceps and hamstring force are the determinants of self-reported general health as assessed by SF-36.

In our study group, the rate of depression was 45.3% and the rate of anxiety was 32%. Sale et al. (21) reported that the rate of depression was 21.9% in patients with hip or knee OA and a significant association between depression and female gender was also determined. The high depression rate found in our study group was thought to be related with female gender and with the duration of pain.

In the present study, the correlations between quality of life and age, BMI, Kellgren grade, functional mobility and WOMAC OA index, depression, and anxiety were examined.

An important finding of the current study was the significant correlation between depression and all subscales of the quality of life, except mental health. There was a significant association between anxiety disorders and all subscales of the quality of life, except physical functioning.

According to our results, a statistically significant correlation was found between pain, stiffness, function, total scores of WOMAC, and all areas of the quality of life (p<0.05), except the stiffness score of WOMAC and the mental health subscale of the SF-36. Both SF-36 and WOMAC are valuable instruments that can give information about health status of the patient with knee OA (22).

Our results indicated a significant positive correlation between functional mobility, measured by the TUG test, and quality of life in knee OA.

This study revealed an inverse relationship between age and the quality of life. In a previous study, OA was suggested to markedly influence the quality of life in patients ≥65 (4).

We found an inverse association between radiologic severity of knee OA and general quality of life and physical functioning.

In a study including 137 patients with knee OA, impairment in the quality of life measured by SF-36 was suggested to be weakly associated with radiologic severity (5). Another study demonstrated no association between the radiologic severity of OA and the quality of life (6).

In this study, quality of life did not show correlation with BMI in women with knee OA.

The limitation of the study is lack of evaluation of the relationship between co-morbidities and the quality of life.

In conclusion, the present study demonstrated that functional status and depression were among the factors that determine the quality of life in women with knee OA. Medical, physical and psychological treatment strategies might be planned to improve the quality of life in patients with OA.

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