

Investigation of Pain, Function, Anxiety, and Depression Levels in Patients with Total Knee Arthroplasty Before Discharge

Total Diz Artroplastisi Yapılan Hastaların Taburculuk Öncesi Ağrı, Fonksiyonel Durum, Anksiyete ve Depresyon Düzeylerinin İncelenmesi

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ABSTRACT

Objective: We aimed to investigate the pain, function, and anxiety-depression levels in patients who had undergone total knee arthroplasty (TKA) in the early postoperative period.

Materials and Methods: Fifty-eight patients between the ages of 60-85 with TKA were included. From the follow-up files of the patients, data on physical characteristics, pain intensity, function, and anxiety-depression levels were used.

Results: When the measurement scores were compared according to gender, no statistically significant difference was found in pain (p:0.49) and physical function (p:0.20). When anxiety-depression levels were compared, it was found that females got higher scores than males (p:0.00). While there was no significant relationship between the pain and knee scores; it was found that there was a moderate positive correlation between pain and anxiety-depression levels (r1:0.520, r2:0.514; p<0.01). There was a statistically significant moderate negative correlation between knee scores and anxiety-depression levels (r1:-0.469, r2:-0.482; p<0.01).

Conclusions: This study showed that the physical and psychological states are interrelated. Evaluation in the postoperative period by considering both parameters; will provide a successful disease management process by playing an active role in the follow-up of patients.

Keywords: Dysfunction, knee prosthesis, osteoarthritis

ÖZ

Amaç: Çalışmamızın amacı; total diz artroplastisi yapılan postoperatif erken dönemdeki hastaların; taburculuk öncesi ağrı, fonksiyonel durum, anksiyete-depresyon düzeylerini incelemektir.

Materyal ve Metot: Retrospektif çalışmamıza 60-85 yaş aralığındaki 58 hasta katıldı. Hastaların takip dosyalarından; fiziksel özelliklerine, ağrı şiddetlerine, fonksiyonel durumlarına ve anksiyete-depresyon düzeylerine ilişkin verileri kullanıldı.

Bulgular: Olguların cinsiyetlerine göre ölçüm skorları karşılaştırıldığında ağrı ve fiziksel fonksiyon parametrelerinde istatistiksel olarak anlamlı fark bulunmadı (p:0.49; p:0,20). Hastane anksiyete ve depresyon düzeyleri karşılaştırıldığında, kadınların erkeklere göre daha yüksek skor aldığı saptandı (p:0,00). Olguların ağrı şiddetleriyle diz skoru arasında anlamlı ilişki bulunmazken; anksiyete-depresyon düzeyleriyle arasında pozitif yönlü-orta düzeyde ilişki olduğu görüldü (r1:0,520, r2:0,514; p<0,01). Diz skoruyla anksiyete-depresyon düzeyleri arasındaysa negatif yönlü-orta düzeyde bir ilişki olduğu bulundu (r1:-0,469, r2: -0,482; p<0,01).

Sonuç: Çalışmamızın sonuçları, olguların fiziksel ve psikolojik durumlarının ilişkili olduğunu gösterdi. Hastaların taburculuk öncesi postoperatif erken dönemde, her iki parametrenin de göz önünde bulundurularak değerlendirilmesi; hastaların taburculuk sonrası takiplerinde etkin rol oynayarak başarılı bir hastalık yönetim süreci sağlayacaktır.

Anahtar Kelimeler: Disfonksiyon, diz protezi, osteoartrit

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INTRODUCTION

Osteoarthritis (OA), one of the world's most common chronic degenerative diseases, occurs primarily in load-bearing joints.^{1,2} OA, which causes functional loss in the knee joint, reduces the quality of life of individuals by negatively affecting their daily living activities and may cause physical and psychosocial deficiencies by limiting their social activities.^{1,3} In addition, the most common symptom in these patients is pain. Pain may lead to limitations in even simple daily living activities as the disease progresses. This may lead to impairment in the patient's psychological health and social functions.^{4,5} Functional status of patients with OA is affected by factors such as immobility due to pain, limitation of joint movement, decrease in muscle strength, etc. Concerning these, walking difficulties may also occur in the advanced stages of OA.³

Total knee arthroplasty (TKA) is a frequently preferred surgical intervention in advanced OA cases where medical treatment and physiotherapy do not benefit.³ It is stated that factors such as depression and anxiety may play a role in the pain intensity and functions of patients with OA. Therefore, the functional disorder, pain, and social isolation caused by the disease play a role in the development of both anxiety and depression in individuals.⁶

It's been reported that the most common psychological disorders along with physical illnesses are anxiety and depression, and these are frequently seen together.⁷ States of depression and/or anxiety, which occur before surgery and increase in the early postoperative period, may lead to the development of chronic pain and negatively affect the functions of patients.^{8,9}

The occurrence of a psychological disorder accompanying the physical illness; can adversely affect the patient's response to treatment, compliance with the treatment and rehabilitation program, quality of life, and the effectiveness of the treatment applied.¹⁰ For this reason, it is essential to determine the severity of these conditions in the early postoperative period and to treat them in time. Considering the impact of emotional states on the worsening of OA symptoms, this study aimed to examine the pain, function, and anxiety-depression levels of TKA patients in the early postoperative period.

MATERIALS AND METHODS

Ethical Status: This study was approved by the Human Research Ethics Committee of Muğla Sıtkı Koçman University (Date: 22.09.2020, decision no:200002/3), and institutional permission was obtained. It has been conducted according to the ethical rules in the Declaration of Helsinki.

This descriptive study was conducted on patients

who had undergone TKA surgery and were hospitalized at the Department of Orthopedics and Traumatology in Muğla Sıtkı Koçman University Training and Research Hospital between January 2019-March 2020. Patients aged 60-85 years, who received physiotherapy and rehabilitation (PTR) care in the early postoperative period during hospitalization in the service, were taken as the sample group. Exclusion criteria were as follows: (1) being a note in the patient's file regarding hearing, vision, and mental problems that may affect the results, (2) having a history of surgery other than TKA in the last 6 months, and (3) missing data. The study was completed by retrospectively examining the PTR records of patients kept by physiotherapists and data obtained from the records of 58 patients who met the criteria.

Outcome Measures

Visual Analogue Scale (VAS): This scale was used to determine the intensity of pain. The patients were asked to mark their pain intensity on a 10 cm line, considering that the starting point is 0 means no pain and the ending point is 10 means unbearable pain. The intensity of pain was determined by measuring the distance between the starting and the patient's marked points.¹¹

Hospital for Special Surgery (HSS) Knee Score: The Turkish version of the HSS Knee Score was used to evaluate the functional status.¹² This scale, which is widely used in the clinic by physiotherapists and orthopedic surgeons, was developed by Insall et al. and includes subjective (52%) and objective (48%) examination criteria. The maximum score that can be obtained (pain (30 points), function (22 points), range of motion (18 points), muscle strength (10 points), deformity (10 points), and instability (10 points)) is 100 points. The function is evaluated as 'excellent' if the score is >85, 'good' if it is between 70-84, 'moderate' if it is between 60-69, and bad if it is <60.¹³

The Hospital Anxiety and Depression (HAD) Scale: The Turkish version of HAD Scale was used to determine the anxiety-depression levels of the patients.¹⁴ This instrument was developed by Zigmond and Snaith¹⁵ and contains 14 items (7 for anxiety and 7 for depression symptoms). The questions are scored between 0-3, and the cut-off score for each subscale is ≥ 8 .^{7,14}

Statistical Analysis: G-Power (Windows version 3.1.9.4) was used to determine the sample size (power:0.80, alpha:0.05, and effect size:0.3 were considered), and it requires a total sample size of 64 participants. Data were analyzed using the Statistical Package for the Social Science (Version 24.0). Skewness-Kurtosis tests were used and it was seen that the data were not suitable for normal distribu-

tion. The Mann-Whitney U test was used to analyze the mean rank differences between categories of different variables, and the relationship between categorical variables was analyzed by Spearman correlation. Statistical significance was set at a 95% confidence interval and $p < 0.05$.

RESULTS

The data of 62 patients were analyzed and 58 patients (38 females and 20 males) were included in this study according to inclusion-exclusion criteria. The mean age of the patients was 69.93 ± 6.24 years. When the pain intensity of the patients was questioned, the median (min-max) values were 5.7 (3.7-

8.7) and 5.6 (2.2-8.9), respectively. Functional status was examined, and it was found that the median (min-max) HSS knee score was 47 (25-71). Depression levels of the patients were within normal limits, and the median (min-max) was 7 (0-18), while anxiety levels were borderline, and the median (min-max) was 8 (0-19). The relationship between these was analyzed and it was found a statistically significant strong positive correlation ($r: 0.825$; $p < 0.01$). The comparison of pain intensity, function, and hospital anxiety-depression levels by gender is shown in Table 1.

Table 1. Comparison of pain intensity, function, and hospital anxiety-depression levels of patients by gender.

	Gender	Median (min-max)	U	p
VAS	Female	5.7 (3.7-8.7)	338.00	0.49
	Male	5.6 (2.2-8.9)		
HSS Knee Score	Female	45 (32-71)	302.00	0.20
	Male	53 (25-63)		
HAL	Female	10 (1-19)	164.00	0.00*
	Male	4 (0-15)		
HDL	Female	9 (0-18)	124.00	0.00*
	Male	2.5 (0-8)		

VAS: Visual Analogue Scale; HAL: Hospital Anxiety Level; HDL: Hospital Depression Level; * $p < 0.05$.

Table 2. The relationship between the pain intensity, function, and hospital anxiety-depression levels of patients.

r	VAS	HSS Knee Score	HAL	HDL
VAS	1	-0.246	0.520*	0.514*
HSS Knee Score	-0.246	1	-0.469*	-0.482*
HAL	0.520*	-0.469*	1	0.825*
HDL	0.514*	-0.482*	0.825*	1

VAS: Visual Analogue Scale; HSS: Hospital Special Surgery; HAL: Hospital Anxiety Level; HDL: Hospital Depression Level; r: Spearman correlation coefficient; * $p < 0,05$.

The relationship between all parameters was determined by Spearman correlation analysis and is shown in Table 2.

DISCUSSION AND CONCLUSION

Our study was completed with the data obtained from the records of 58 patients aged between 60-85 years. Our findings indicated no statistically significant difference between genders in pain and physical function scores. When we compared the anxiety-depression levels, we found that females got higher

scores than males. While there was no significant relationship between the pain and knee scores, it was found that there was a moderate positive correlation between pain and anxiety-depression levels. Also, there was a statistically significant moderate negative correlation between knee scores and anxiety-depression levels.

Pain and functional status after TKA depend on a wide range of factors, including gender. Many studies reported females having higher pain intensity and/or lower function than males. Nandi et al. found

that female patients had higher pain intensity compared to males. Also, they reported function scores in favor of male subjects in this study with 100 individuals.¹⁶ However, there are also studies in the literature showing that there is no difference by gender. Sanchez-Santos et al. reported that there was no difference by gender in outcome scores, including pain and function in the patients (aged 60-80 years).¹⁷ Similarly, we found no statistical difference between the genders with regard to HSS knee scores. The mean HSS knee scores were 46.16 for females and 48.6 for males, which were classified as “poor”. In our study, the pain intensity of females was found to be higher than males, but there was no statistically significant difference. It was thought that this situation might be due to the small sample size of the current study.

When the Hospital Anxiety Level (HAL) and Hospital Depression Level (HDL) results in our study were compared by gender, it was seen that females got higher scores than males. It was reported in many studies that mental disorders such as depression-anxiety are more common in females. In a study conducted by Stundner et al. on TKA patients, it was reported that anxiety-depression levels of females were higher than males.¹⁸ Similarly, Nandi et al. found a similar conclusion.¹⁶ Considering the results obtained, our findings were supported by the literature. When the relationship between these two parameters was examined, we determined a strong positive correlation between anxiety and depression levels. The reason may be that these psychiatric conditions are frequently seen together in the clinic and the commonality in their diagnostic symptoms.⁷

When the studies in the literature are reviewed, although most of the pain and function evaluations were made in the chronic postoperative period after discharge, there are also acute period studies. As a matter of fact, if the pain is high in the early period, it aggravates the knee functions; similarly, the decrease in the chronic period positively affects the knee scores. Many studies reported that high-intensity pain affects function negatively.^{19,20} However, Wylde et al. reported that there was insufficient evidence to draw firm conclusions about the association between any postoperative patient-related factors, such as function and chronic pain after TKA.²¹ Similarly, our results showed that there was no statistically significant relationship between the VAS and the HSS knee scores.

It is known that the psychological status of patients influences their perception of pain after TKA by focusing on the roles of depression and anxiety. Also, pain catastrophizing may be a consistent predictor of poor outcomes after TKA.²² According to the findings of our study, it was seen that the pain intensity and hospital anxiety-depression levels of pa-

tients were correlated. Similarly, many studies are reporting a statistically significant relationship between pain intensity and anxiety-depression levels. Lots of studies reported that pain has an inevitable relationship with anxiety-depression and patients with anxiety/depression symptoms have higher pain scores.¹⁶

When we examine the current publications, it is seen that there are many studies resulting that there is a relationship between functional status and anxiety and depression. Xu et al. reported a significant correlation between the postoperative functional status of patients who had undergone TKA and their anxiety and depression levels.²³ In the study conducted by Kılınç, as the physical activity levels of individuals in the postoperative period who had TKA increased, it was found that their pain decreased, their functionality increased, and their anxiety and depression levels decreased.²⁴ A previously published research by Scopaz et al. has shown that high levels of anxiety and depression affect function negatively.⁶ In our study, it was found that there was a moderate negative correlation between the function and anxiety-depression levels of the patients. It can be said that the increase in the depression-anxiety levels of the patients is related to the decrease in their functions. These results showed that although we consider the physical and psychological states of the patients separately, they are indeed related to each other. It is known that the presence of physical illness increases the risk of any psychiatric disorder and is mostly seen together with depression and anxiety.⁷ From a clinical perspective, research on these psychological factors is necessary because it helps us to identify factors warranting our attention when designing interventions to improve outcomes after TKA. According to a definition by World Health Organization, health is “a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity”.²⁵ As you can see, the holistic health approach includes many different components. If these components have any problem, the general health status may also be adversely affected.²⁶ The most significant limitation of our study is the small sample size and the lack of evaluations during the preoperative period.

Most studies identified that a higher baseline anxiety and depression level predicted a poorer outcome. Also, it is stated that higher pre-operative knee pain and poor function were consistent predictors of worse outcomes after surgery.^{27,28} A systematic review by Sorel et al. showed that perioperative interventions targeting psychological distress for TKA patients seem to positively affect postoperative outcomes such as pain, function, and quality of life.²⁹ Based on these, it can be thought that education about the operation, physiotherapy, and psychologi-

cal support in the preoperative period may have positive effects on the management of the disease in the postoperative period.

In conclusion, it is very important to determine the severity of symptoms such as pain, physical dysfunction, and anxiety-depression in TKA patients in the early postoperative period and to treat in time to prevent them from worsening the current situation by affecting each other. The success of TKA surgery is related to the effective postoperative treatment approaches, and the patient's compliance and willingness to this treatment program should be kept in mind.

Ethics Committee Approval: Our study was approved by the Ethical Committee of Muğla Sıtkı Koçman University (Date:09.22.2020, decision no:200002/3). This study was conducted in accordance with the declaration of Helsinki.

Conflict of Interest: No conflict of interest was declared by the authors.

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