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THE ROLE OF PREOPERATIVE FACTORS ON ACUTE POSTOPERATIVE PAIN AND PHYSICAL FUNCTION AFTER TOTAL KNEE ARTHROPLASTY

ORIGINAL ARTICLE

ABSTRACT

Purpose: Many preoperative factors can affect the pain and physical function complaints reported in the acute period after total knee arthroplasty (TKA). This study was planned to reveal the preoperative factors that may affect pain and physical function in the acute period of patients post-TKA.

Methods: Seventy patients (53 women, 17 men) with a mean age of 66.5±7.53 years were enrolled in this study. Before the surgery, the Hospital for Special Surgery Knee Scoring, a Visual Analog Scale, the Tampa Kinesiophobia Scale, the Hospital Anxiety and Depression Scale, the International Physical Activity Questionnaire Short Form and the Body Awareness Questionnaire were used to evaluate the patients. The Brief Pain Inventory and the Timed Up and Go Test were used for post-surgery assessments.

Results: Postoperative acute pain (PAP) was associated with preoperative kinesiophobia, anxiety, depression, and pain severity (r=0.684, p=0.000; r=0.424, p=0.000; r=0.329, p=0.005; r=0.259, p=0.030, respectively). Postoperative acute physical performance (PAPP) was associated with preoperative kinesiophobia (r=0.280 ; p=0.019). It was found that there was no relationship between preoperative body awareness and acute postoperative pain and physical performance (p>0.05). There was a significant difference in PAPP between inactive and inactive preoperative physical activity levels (p=0.000). There was a statistically significant difference between the PAP and PAPP between patients with preoperative knee pain duration of 5 years and under and patients with 6 years or more (p=0.025).

Conclusion: Through the assessment of the preoperative risk factors identified in this study, patients at higher risk of acute postoperative pain and poor physical performance can be identified.

Keywords: Acute Pain, Knee Arthroplasty, Physical Function, Preoperative Predictor, Recovery

TOTAL DİZ ARTROPLASTİSİ SONRASI AKUT POSTOPERATİF AĞRI VE FİZİKSEL FONKSİYON ÜZERİNDE PREOPERATİF FAKTÖRLERİN ROLÜ

ARAŞTIRMA MAKALESİ

ÖZ

Amaç: Total Diz Artroplastisi (TDA) sonrası akut dönemde bildirilen ağrı yakınmalarını ve fiziksel fonksiyonu etkileyebilecek preoperatif faktörler mevcuttur. Bu çalışma, TDA sonrası hastaların akut dönemde ağrı ve fiziksel fonksiyonuna etki edebilecek preoperatif faktörleri ortaya çıkarmak amacıyla planlandı.

Yöntem: Çalışmaya yaş ortalamaları 66,5 ± 7,53 olan 70 hasta (53 kadın, 17 erkek) dahil edildi. Ameliyat öncesi hastaları değerlendirmek için Hospital for Special Surgery Diz Skorlaması, Vizüel Analog Skalası, Tampa Kinezyofobi Ölçeği, Hastane Anksiyete ve Depresyon Ölçeği, Uluslararası Fiziksel Aktivite Anketi Kısa Formu ve Vücut Farkındalığı Anketi kullanıldı. Ameliyat sonrası değerlendirmeler için Kısa Ağrı Anketi ve Süreli Kalk ve Yürü Testi kullanıldı.

Sonuçlar: Postoperatif akut ağrı (PAA), preoperatif kinezyofobi, anksiyete, depresyon ve ağrı şiddeti ile ilişkili bulunurken (r=0,684, p=0,000; r=0,424, p=0,000; r=0,329, p=0,005; r=0,259, p=0,030, sırasıyla) postoperatif akut fiziksel performans (PAFP) preoperatif kinezyofobi ile ilişkili bulunmuştur (r=0,280, p=0,019). Preoperatif vücut farkındalığı ile PAA ve PAFP ile ilişkili olmadığı bulunmuştur (p>0,05). Preoperatif fiziksel aktivite düzeyi inaktif olanlar ile inaktif olmayanlar arasında PAFP açısından anlamlı fark bulunmuştur (p=0,000). Ameliyat öncesi diz ağrısı süresi 5 yıl ve altında olan hastalar ile 6 yıl ve üzerinde olan hastalar arasında PAA ve PAFP arasında istatistiksel olarak anlamlı bir fark bulunmuştur (p=0,025).

Tartışma: Bu çalışmada tanımlanan preoperatif risk faktörlerinin değerlendirilmesi yoluyla akut postoperatif ağrı ve kötü fiziksel performans riski daha yüksek olan hastalar belirlenebilir.

Anahtar kelimeler: Akut Ağrı, Diz Artroplastisi, Fiziksel Fonksiyon, Preoperatif Tahmin Edici, İyileşme

INTRODUCTION

Total Knee Arthroplasty (TKA) is a reliable treatment method that is considered as the gold standard in the treatment of late-stage osteoarthritis and provides function in a short time in patients who do not respond to conservative treatments (1). The primary objectives of TKA are to reduce pain, increase functionality, correct deformities in the knee and consequently, improve the patient's quality of life (2). However post-TKA some patients report significant reductions in knee pain and increased functionality, while others report ongoing or even worsening pain. In the first days after TKA, a delay in mobilization time may occur as a result of the lack of pain-reducing interventions. Delayed mobilization may lead to an increased risk of developing venous thrombosis, poor wound healing, prolonged hospital stay and psychological problems, and reduced patient satisfaction. In addition, long-term acute postoperative pain is an important risk factor in the development of chronic pain (3). Studies have reported that 15%-25% of patients with TKA need to identify related factors that may cause patient dissatisfaction (4). These findings emphasis the importance of identifying modifiable determinants with the potential to alleviate poorly managed acute postoperative pain and loss of function. When considering modifiable preoperative factors that may affect pain and physical performance after TKA, most of the studies in the literature are studies of patients in the subacute and chronic phases. In studies, postoperative subacute and chronic pain was associated with modifiable factors such as preoperative pain catastrophizing, anxiety, chronic pain intensity and knee pain (5-9). Studies have shown that acute postoperative pain and physical performance are associated with preoperative modifiable factors such as anxiety, depression, pain catastrophizing and high pain level. However, due to the heterogeneity of study methodologies and results, there is uncertainty regarding the relationships between the findings (10-13). No study has been found on preoperative fear of movement, body awareness, duration of chronic knee pain and physical activity levels that may affect postoperative pain and physical performance in the acute period.

People who are physically active and exercise before surgery have a shorter hospital stay after the operation. However, these recovery outcomes are debated in patients undergoing knee arthroplasty (14). Although the relationship between preoperative pain and postoperative acute pain is known in studies, it has not been investigated whether preoperative knee pain duration is related to postoperative acute pain and physical performance.

This study aimed to examine the relationship of pain and physical performance in patients who underwent TKA with preoperative movement fear, anxiety, depression, body awareness, and pain level at the time of interview. The study also aimed to investigate whether there is a difference between acute postoperative pain and physical performance of patients with different levels of preoperative physical activity and chronic knee pain duration.

METHODS

This is a cross-sectional study. The study was conducted between March and August 2019 at Süleyman Demirel University Faculty of Medicine, Department of Orthopedics and Traumatology, with 70 patients (53 women, 17 men) aged between 40-85 years who were planned to undergo TKA. The research was conducted in accordance with the Declaration of Helsinki. Informed consent was obtained from the patients through a preliminary form informing them about the study. Patients who had the ability to walk at least 10 meters before surgery, who could understand written and oral commands, and who will undergo unilateral TKA were included in the study. Patients who had previously undergone knee replacement surgery, were diagnosed with a psychiatric problem, with a known cancer history, having hip and ankle problems that would interfere with walking and evaluation, patients with cardiovascular and lung disease (chronic obstructive pulmonary disease, pacemaker use, heart failure), and morbidly obese patients were excluded from the study (10, 15, 16).

All patients were evaluated the day before the operation and on the 3rd day after the operation. First, patients were verbally informed about the purpose of the study and the evaluations to be conducted. Following this, they signed the 'Informed Consent

Form' in writing. Subsequently, the "Informed Voluntary Patient Form" was signed in writing. After collecting the preoperative demographic information and medical histories, pain intensity, fear of movement, anxiety and depression levels, physical activity status, and body awareness were evaluated. Three days after the surgery, pain intensity and physical performance were re-evaluated.

All patients were operated on by experienced surgeons with at least 5 years of TKA experience. A three-compartment cemented TKA protocol was applied using a medial parapatellar approach, without patella replacement. Primary TKA was performed on all patients and no patients were given simultaneous bilateral knee arthroplasty. During the 4-6-day hospital stay, the patients were managed with a standardized medical, pharmaceutical, and rehabilitation treatment protocol. Starting on postoperative day 1, patients were assisted with ambulation using a walker, supported by a physiotherapist, within their weight-bearing capacity. The goal of discharge related to functionality in the patient was an independent and safe ambulation on a flat and non-slippery floor with auxiliary walking devices (walker, tripod, cane, etc.). Before being discharged, the patients were given home exercise programs that they could do on the pain limit.

Preoperative Evaluation Methods

Knee Function

The HSS Knee Scoring is an area-specific questionnaire developed as a standard tool designed to evaluate outcomes in all knee disorders and especially in patients who underwent TKA. It includes 6 different categories: Pain, Function, Joint Mobility (ROM), Muscle Strength, Flexion Deformity, and Instability. Finally, there is the Extraction Score section. The highest HSS score is 100. If the score obtained is ≥85, it is classified as 'excellent', if 70-84, as 'good', if 60-69, 'moderate', and if ≤59 as 'bad'. The validity and reliability study of the Turkish version of the HSS Knee Scoring was carried out in patients who underwent TKA at least 6 months ago and were able to act independently (17).

Pain

The Visual Analogue Scale (VAS) was used to assess preoperative pain severity. Verbal or numerical scales with measurement grades of 0-10 are often used in an objective evaluation of pain, which is a VAS subjective complaint. Intervals for pain severity are <3 mild pain, 3-6 moderate pain, and >6 severe pain (18). The modified 0-10-point version of the VAS scale was found to be valid and reliable in patients who underwent TKA (19).

Kinesiophobia

The Tampa Kinesiophobia Scale (TKS) is an assessment survey commonly used to measure pain-related movement and fear of re-injury in patients at high risk for chronic muscular pain. The TKS has 17 items in the form of a checklist. The scale includes injury/re-injury and fear-avoidance parameters in work-related activities. A high score on the scale indicates that the person has a high kinesiophobia. Test-retest reliability of the scale was found to be excellent (20).

Anxiety and Depression

The Hospital Anxiety and Depression Scale (HADS) is a self-report scale consisting of anxiety and depression subscales. As a result of the study conducted in Türkiye, the cutoff score for the anxiety subscale is 10 and the cutting score for the depression subscale is 7. Those who score above these scores are considered at risk (21). The validity and reliability of the Turkish version of the scale were established by Aydemir et al. (22).

Physical Activity Level

The International Physical Activity Questionnaire-Short Form (IPAQ-SF) was used to determine the preoperative physical activity level IPAQ-SF consists of 4 separate sections and 7 items and provides information on the time spent walking and in moderate and vigorous physical activities. The time spent sitting in the last 1 week is recorded separately. The level of physical activity is calculated by the Metabolic Equivalent of Task [MET] method. After doing the score calculations with the MET method of the IPAQ-SF, which we used to determine preoperative physical activity levels in our study, we divided our sample group into Inactive (<600 MET-min/wk) and Active (≥ 600 MET-min/wk) (23, 24). The validity and reliability of IPAQ-SF in Turkish was determined by Saglam et al.(25).

Body Awareness

The Turkish version of the Body Awareness Questionnaire (BAQ) was used to assess patients' body awareness. The BAQ is an 18-item questionnaire developed to determine normal or abnormal sensitivity levels towards body composition and consists of 4 subgroups, namely, changes in the prediction of body responses, sleep-wake cycle, prediction at the onset of disease, pay attention to changes and reactions in the body process. The patient is asked to rate each expression in numbers between 1 and 7 points (1 point= 'The expression used is not true to me at all.' 7 points= 'The phrase used is completely true to me.'). The score range of the questionnaire is 18-126 points. High scores from the survey indicate that the person's body sensitivity is better BAQ was developed by Shields et al. in 1989 and was validated in Turkish by Karaca (26).

Postoperative Evaluation Methods

Acute Pain

In order to evaluate pain on postoperative day 3, the Brief Pain Inventory (BPI) was used. The BPI consists of 4 items related to pain severity (severity dimension) and 7 items related to pain inhibiting the person's daily activities (obstruction dimension). The severity dimension measures the most severe, mild, average, and interview pain in the last 24 hours. Pain severity is measured using a numerical pain scale (0–10) (0= no pain, 10= worst imaginable pain). The dimension of obstruction measures the degree to which the pain the patient feels in the last 24 hours interfering with their daily activities (emotional condition, walking, deep breathing and coughing exercises, sleep, and enjoyment of life). BPI was validated in Turkish by Dicle et al.(27, 28).

Acute Physical Performance

The physical performance of the patients on postoperative day 3 was evaluated using the Timed Up and Go (TUG) Test. The TUG Test can be safely applied as an indicator of balance, walking speed, functional ability, and lower extremity strength, and is an adequate performance-based measurement method evaluating functional changes in these patients (16, 29). While the patient was sitting on a chair, he was asked to get up from the chair, walk 3 meters as fast as possible, turn around, and get back on the seat. The time spent by the patient to complete the test was recorded. Shorter test times show better physical performance (30).

Statistical analysis

The G*Power program was used to determine the number of patients. The study results of Lindberg et al. were used (11) .In the power analysis performed before the study, our sample size was determined as 64 with 1% type 1 error and 90% power. Considering the possible data loss, it was decided to include a total of 70 people for the study. Statistical analyses were performed using IBM SPSS Statistics 20.0 (SPSS, Chicago, IL, USA), with the significance level set at 0.05. In the descriptive statistics related to continuous data, mean + standard deviation (SD), median, minimum, maximum values, and percentage values are given in dashed data. The Shapiro-Wilk test was used to examine the compliance of the data with normal distribution. Spearman correlation coefficient was used to examine the relationships between measurements. The correlation coefficient between 0.2-0.29 was considered weak, while the correlation coefficient between 0.30-0.49 was considered moderate, the correlation coefficient >0.50 was considered strong (31). The appropriateness of the data to normal distribution was tested in comparison of postoperative acute pain and physical performance of those with different levels of preoperative physical activity and chronic knee pain duration. A t-test was used in data that matched normal distribution and the Mann-Whitney U test was used in non-normally distributed data.

Ethical Consideration

To conduct the study, the ethics committee approval was obtained from the Directorate of Ethics for Clinical Research at Suleyman Demirel University Faculty of Medicine (Date: March 11, 2019; Number: 39474).

RESULTS

The mean age of the patients was 66.5 ± 7.53. Other demographic information about patients is summarized in Table 1.

The relationship of patients' preoperative TKS, HADS, BAQ, and VAS results with acute pain and

Table 1. Demographic Information of The Patients (n=70)

Variables		Mean ± SD / number	%
Age (year)		66.5 ± 7.53	
Height (cm)		160.4 ± 7.44	
Weight (kg)		80.8 ± 14.18	
BMI (kg/m^2)		31.37 ± 4.96	
HSS Total Score	Opere knee	56.45 ± 12.49	
	Non-opere knee	67.12 ± 13.13	
Gender	Female	53	75.7
	Male	17	24.3
BMI classification	Normal weight	6	8.6
	Overweight	21	30
	Obese (1st grade)	25	35.7
	Obese (2nd grade)	18	25.7
Educational status	Literate	7	10
	Primary school	53	75.7
	Secondary school	9	12.9
	High school	0	0
	University	1	1.4
Continuous drug use due to chronic disease or knee pain	Yes	65	92.9
	No	5	7.1
Previous (except for knee area) case of undergoing any surgical operation	Yes	53	75.7
	No	17	24.3
Opere knee	Right	33	47,1
	Left	37	52.9
Duration of pain caused by knee pain	<6 years	31	44.3
	≥ 6 years	39	55.7
Physical activity status	Inactives	41	58.5
	Actives	29	41.5
Presence of anxiety, according to HADS		32	45.7
Presence of depression, according to HADS		16	22.8

BMI: Body mass index, n: number of patients, HSS: Hospital for Special Surgery, HADS: Hospital Anxiety and Depression Scale

physical performance after surgery is shown in Table 2.

A moderate positive correlation was found between preoperative TKS scores and the worst pain in the last 24 hours (r=0.348, p<0.05) and average pain (r=0.415, p<0.001), and a strong positive correlation was found between preoperative TKS scores and pain intensity during the interview (r=0.684, p<0.001). A weak positive correlation was identified between preoperative TKS scores and TUG test durations (r = 0.280, p <0.05).

A moderate positive correlation was found between the preoperative HADS-A (r= 0.424, p<0.05) and HADS-D (r=0.329, p<0.05) scores of the patients and the postoperative pain intensity at the time of interview. It was found that there was no correlation between the preoperative BAQ scores of the patients and the worst postoperative pain and average pain felt in the last 24 hours, pain at the time of interview and TUG test durations (p>0.05). A weak positive correlation was found between preoperative VAS scores of patients and the worst pain severity in the last 24 hours (r= 0.259, p<0.05).

There was a statistically significant difference between acute postoperative TUG Test durations of

Table 2. Relationship of Patients with Acute Pain and Physical Performance After Surgery of TKS, HADS, BAQ Results Before Surgery

		TKS	HADS-A	HADS-D	BAQ	VAS
Pain Severity	r	0.348	0.138	0.009	0.196	0.259
-worst pain*	p	**0.003†**	0.253	0.944	0.104	**0.030†**
-average pain*	r	0.415	0.147	0.121	0.158	0.184
	p	**0.000†**	0.224	0.319	0.193	0.128
-pain at the time of the interview	r	0.684	0.424	0.329	0.214	0.182
	p	**0.000†**	**0.000†**	**0.005†**	0.075	0.132
TUG Test (sec)	r	0.280	0.206	0.200	-0.070	0.196
	p	**0.019†**	0.087	0.097	0.567	0.103

TKS: Tampa Kinesophobia Scale, HADS-A:Hospital anxiety and depression scale anxiety sub-score, HADS-D: Hospital anxiety and depression scale depression sub-score, BAQ: Body Awareness Questionnaire, VAS: Visual Analog Scale, *: in the last 24 hours, †: p<0.05, r: Spearman Correlation, TUG Test: Timed Up and Go Test

Table 3. Comparison of Acute Pain and Physical Performance Outcomes After Surgery of Patients with Different Levels of Physical Activity Before Surgery

	Physical activity status	n	Mean ± SD	Median(Min-Max)	p
worst pain*	Inactives	41	8.22±1.40	8 (5-10)	z=-1.293
	Actives	29	7.45±2.08	8 (2-10)	p=0.196
average pain*	Inactives	41	5.88±1.20	6 (4-9)	z=-0.855
	Actives	29	5.31±1.94	5 (0-8)	p=0.392
pain at the time of the interview	Inactives	41	4.49±2.54	5 (0-9)	t=0.127
	Actives	29	4.41±2.16	4 (0-9)	p=0.899
TUG Test (sec)	Inactives	41	64.0±26.6	59 (27-175)	z=-3.841
	Actives	29	45.31±18.04	40 (21-103)	**p=0.000†**

*: in the last 24 hours, n: number of patients, TUG Test: Timed Up and Go Test, SD: Standard Deviation, †: p<0.05, P: Mann-Whitney Test

patients with preoperatively inactive and active patients (p<0.05). The TUG Test duration of inactive patients was significantly higher than that of active patients. Details are shown in Table 3.

There was a statistically significant difference between the acute postoperative average pain in the last 24 hours, pain severity at the time of the interview, and TUG Test durations between patients

Table 4. Comparison of Acute Pain and Physical Performance Outcomes After Surgery with Patients with 5 Years and Under Preoperative Knee Pain Duration (Short Pain Duration) and Patients with 6 Years or More (Long Pain Duration)

	Pain duration classification	Mean ± SD	Median (Min-Max)	p
worst pain*	short pain duration	7.52±1.99	8 (2-10)	z=-1.415 p=0.157
	long pain duration	8.21±1.47	8 (5-10)	
average pain*	short pain duration	5.16±1.73	5 (0-9)	z=-2.245 **p=0.025**
	long pain duration	6.03±1.32	6 (2-8)	
pain at the time of the interview	short pain duration	3.77±2.32	4 (0-8)	z=-2,071 **p=0.038**
	long pain duration	5.0±2.30	5 (0-9)	
TUG Test (sec)	short pain duration	51.71±26.53	48 (21-175)	z=-2,130 **p=0.033**
	long pain duration	59.87±23.58	58 (27-149)	

*: in the last 24 hours, TUG Test: Timed Up and Go Test, SD: Standard Deviation, p: Mann-Whitney Test, p<0.05.

with preoperative knee pain duration of 5 years and under and patients with 6 years or more ($p<0.05$). Patients with preoperative knee pain duration of 6 years or more have significantly higher acute postoperative mean pain and pain intensity at the time of the interview. Details are shown in Table 4.

DISCUSSION

The results of our study provide valuable information in identifying the factors that cause delayed healing in the acute period after TKA. In this study, which was planned to determine the role of preoperative factors in acute pain and physical performance after TKA, postoperative acute pain was found to be related to kinesiophobia, anxiety, depression and pain intensity at interview, while postoperative acute physical performance was found to be related to preoperative kinesiophobia. In our study, a significant difference was found between the 'inactive' and 'active' groups in terms of acute postoperative physical performance. Similarly, it has been found that patients who previously received a preoperative exercise programme showed faster physical and functional recovery after surgery (32). Activity levels of patients can be increased with preoperative exercise programmes. Thus, postoperative pain levels and functional parameters of the patients may improve more in the postoperative period and the duration of hospital stay may be reduced.

Psychological factors play an important role in patient pain perception, rehabilitation compliance and patient outcomes, particularly in procedures requiring comprehensive rehabilitation such as total joint arthroplasty (33). In our study, a moderately significant relationship was observed between preoperative kinesiophobia and postoperative acute pain. Additionally, fear of movement was found to potentially have a negative impact on patients' postoperative physical function and recovery process. These findings highlight the necessity of considering psychological factors in postoperative pain management and functional recovery. In particular, assessing psychological factors such as kinesiophobia, which may limit movement, could contribute to a more effective rehabilitation process.

Post-TKA walking function shows significant improvement compared to pre-TKA values (34). In our study, it was observed that the increased fear of movement negatively affected patients' walking speed and that the time required to complete a safe walking distance increased due to reduced mobility. To enhance postoperative mobility, it is essential to thoroughly examine the factors that may influence physical performance. A systematic review highlights the significant role of psychological factors as preoperative predictors of improvements in pain intensity and physical function after TKA. This study supports the growing body of literature demonstrating the prognostic value of psychological factors in recovery outcomes (7). In this study, preoperative anxiety was found to be associated with postoperative acute pain and anxiety. However, since this study only examined associations, it is not appropriate to make direct generalizations about the effects of preoperative anxiety on postoperative pain management. Nevertheless, the literature suggests that changes in anxiety levels during the postoperative period may play a significant role in pain development. In this context, it is suggested that providing psychological support in the preoperative period may contribute to postoperative pain management and functional recovery (15, 35, 36).

However, in our study, no relationship was found between preoperative anxiety and depression and acute postoperative physical performance. In this study, anxiety scores of 58% and depression scores of 61% of patients with TKA were above the threshold value. In our study, this rate was 45% for anxiety and 22% for depression. Contrary to previous results, we believe that the lack of association between anxiety and depression and physical performance may be due to fewer patients showing symptoms of anxiety and depression above the threshold in the sample group in our study.

Patients with psychological problems such as anxiety, depression and kinesiophobia should be identified before surgery to prevent poor rehabilitation and surgical outcomes. In addition, early recognition and reduction of kinesiophobia may reduce the behaviour of avoiding physical activity due to pain. It may prevent the vicious cycle of pain-disability-pain that seems likely to occur in the future after surgery.

There exists no study in the literature evaluating body awareness in patients who underwent TKA. Erden et al. reported that pain and emotional condition in healthy people affect body awareness indirectly. It was found that patients who have good ability to identify the body and perceive the sensory, physiological, and physical stimulations of the body, that is, those with high body awareness, have reduced pain and less frequent depressive symptoms (37). In our study, no association was found between preoperative body awareness and acute postoperative pain and physical performance.

There are a limited number of standardized tools in Turkish for assessing body awareness. Although the BAQ demonstrates high validity and reliability, it assesses body awareness in a unidimensional manner and does not include components specifically associated with pain perception. This limitation may have contributed to the inability to detect a relationship between body awareness, pain, and physical performance. Additionally, considering that body awareness may vary in the postoperative period, the fact that our study assessed it only in the acute postoperative phase and did not examine its long-term effects may have contributed to the lack of an observed relationship. Furthermore, it has been noted that this questionnaire omits certain fundamental domains that could potentially capture both adaptive and maladaptive aspects of body awareness (38). This study also draws attention to the lack of this field in the literature.

Dash et al. investigated the relationship between preoperative walking ability and functional outcome and quality of life after TKA. They concluded that patients with an active preoperative lifestyle and good walking ability had significant improvements in functional ability in the early and late postoperative periods compared with patients with a sedentary lifestyle and poor walking ability (39).

In our study, patients who were inactive before surgery (41 patients) had significantly worse acute postoperative physical performance than active patients (29 patients). The reason for 58.5% of patients having an inactive lifestyle may be OA-related pain, which is the primary indication for TKA. As 55.7% of the patients were known to have had knee pain for more than 6 years, it is possible that they adopted a sedentary lifestyle due to pain.

Patients with chronic knee pain for longer periods of time have higher complication rates (40). Based on this information, we divided the patients based on preoperative chronic pain duration as '<6 years' (31 patients) and '≥ 6 years' (39 patients). The patient group with preoperative chronic pain duration of 6 years or more showed worse acute postoperative pain and physical performance results compared to the other group. Complications that develop after TKA and delays in functional improvements will increase the rate of hospital admission, which affects the success rate of TKA. Complications and early hospital admission rates are important in determining the success of TKA; therefore, as part of the strategy to prevent post-TKA complications, preoperative knee pain duration should also be taken into account.

In summary, modifiable preoperative factors were found to be associated with acute postoperative pain and physical performance in patients who underwent total knee arthroplasty. These results may be useful in designing interventions aimed at improving postoperative pain and physical performance.

Study Limitations and Future Perspective

The strength of our study is that it is the only study to comprehensively examine modifiable preoperative factors associated with acute postoperative pain and physical performance in patients undergoing TKA. However, due to the unequal gender distribution in the study sample and the inclusion criteria, the results cannot be generalized to all TKA patients. Additionally, the fact that surgical procedures were performed by different surgeons and that the dominance of the operated limb was not considered are other limitations of our study. Future studies should take into account limb dominance and the impact of surgical procedures on study outcomes. To minimize this effect, surgical procedures should be standardized. By using a larger sample size and a broader age range, the findings of studies can be generalized to a wider population. It is believed that this study may contribute to further research in the relevant field.

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