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**THE RELATIONSHIP OF COVID-19 FEAR WITH PREOPERATIVE ANXIETY
AND POSTOPERATIVE ANALGESIC REQUIREMENT IN TOTAL HIP AND KNEE
ARTHROPLASTY PATIENTS**

**Total Kalça ve Diz Artroplasti Hastalarının Covid-19 Korkusunun Ameliyat Öncesi
Anksiyete ve Ameliyat Sonrası Analjezik Gereksinimi ile İlişkisi**

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ABSTRACT

It was conducted to determine the relationship between fear of Covid-19 and preoperative anxiety and postoperative analgesic requirement in total hip and knee arthroplasty patients. This descriptive study was conducted with 331 patients scheduled for arthroplasty who were hospitalized in the orthopedic clinic of a hospital in eastern Turkey between March 2022-2023. Fear of covid-19, state anxiety inventory, and visual analogue pain scale were used. The mean age of the patients was 61.9±14.4 years, 52.0% had undergone total knee arthroplasty, and there was no relationship between Covid-19 fear score and state anxiety score. A positive significant correlation was found between opioid requirement and Covid-19 fear score on the first and second days after surgery. A weak positive correlation was found between non-steroidal anti-inflammatory drug (NSAID) requirement and Covid-19 fear score on the zero, first and second days after surgery. A weak negative correlation was found between paracetamol use and Covid-19 fear score on the first and second days. It was determined that the Covid-19 fear experienced by the patients before surgery was not associated with preoperative anxiety and increased the use of analgesics such as NSAIDs and opioids after surgery.

Keywords: Analgesic requirement, Anxiety, Arthroplasty, Fear of covid-19.

ÖZ

Total kalça ve diz artroplasti hastalarında Covid-19 korkusunun ameliyat öncesi anksiyete ve ameliyat sonrası analjezik gereksinimi ile ilişkisini belirlemek amacıyla yapıldı. Tanımlayıcı türdeki çalışma, Mart 2022-2023 tarihlerinde Türkiye'nin doğusunda bir hastanenin ortopedi kliniğinde artroplasti planlanmış 331 hastayla yapıldı. Çalışmada covid-19 korkusu, durumluk kaygı ölçeği ve vizüel analog ağrı skalası kullanıldı. Hastaların yaş ortalamasının 61.9±14.4 olduğu, %52.0'sinin total diz artroplastisi geçirdiği ve Covid-19 korku puanı ile durumluk kaygı puanı arasında ilişkinin olmadığı belirlendi. Covid-19 korku puanı ile opioid gereksinimi arasında ameliyatın birinci ve ikinci gününde pozitif yönde anlamlı ilişki belirlendi. Covid-19 korku puanı ile non-steroid antiinflamatuvar ilaç (NSAİİ) gereksinimi arasında ameliyatın sıfırncı, birinci ve ikinci gününde pozitif yönde zayıf ilişki saptandı. Parasetamol kullanımı arasında ise birinci ve ikinci gün negatif yönde zayıf ilişki saptandı. Ameliyat öncesi hastaların yaşadığı Covid-19 korkusunun ameliyat öncesi anksiyete ile ilişkili olmadığı ve ameliyat sonrası NSAİİ ve opioidler grubu analjezik kullanımını artırdığı saptandı.

Anahtar Kelimeler: Analjezik gereksinimi, Anksiyete, Artroplasti, Covid-19 korkusu.

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INTRODUCTION

Today, the most performed orthopedic surgeries include total hip arthroplasty (THA) and knee arthroplasty (TKA) (Süzen, Kızıltan & Güçlü, 2021). After these surgeries, patients experience pain, need for equipment during mobilization, infection, dislocation of the prosthesis, and re-operation (Erlenwein et al., 2017). For all these reasons, patients experience fear and anxiety after total hip and knee surgeries (Aşcı, 2019; Duivenvoorden et al., 2013; Mete & Avcı Işık, 2019).

During periods of epidemics, patients in the perioperative period may experience fear of contracting an infectious disease in addition to the problems of the surgery process. Covid-19 disease, which continues its epidemic effect with its new variants today, may negatively affect the psychological states of individuals in the perioperative period. Many studies have stated that Covid-19 symptoms are seen in a shorter time in individuals who have undergone surgery, and the death rates of patients infected with Covid-19 are pretty high (Kumar, Renuka, Kalaiselvan & Arunkumar, 2017; Lim, Kim & Kim, 2022; Wu & McGoogan, 2020). Studies have reported that the fear of being infected with the Covid-19 virus is an additional concern in patients undergoing surgery (Arpaci, Karataş & Baloğlu, 2020; Balkaya, Karaca, Yılmaz, & Ata, 2021; Soydan, Yanık, Uğraş, & Ayan, 2023). In addition, patients experience fear of being quarantined due to Covid 19, and they also experience fear of loneliness due to isolation (Arpaci et al., 2020; Kumar et al., 2017; Wu & McGoogan, 2020).

There are many studies in the literature showing that there is a high level of fear and anxiety before total hip and knee arthroplasty surgeries (Aşcı, 2019; Duivenvoorden et al., 2013; Mete & Avcı Işık, 2019). In addition, limited literature also reports that preoperative Covid-19 fear and anxiety increase in patients undergoing THA and TKA surgery (Brown et al., 2020). Anxiety and fear are also perceived as threats to the individual and initiate many pathological processes by causing a response in the neuroendocrine system, an increase in the release of catecholamines and cortisol, and a negative nitrogen balance (Dagli, Avcu, Metin & Kiyamaz, 2019). In this context, anxiety and fear before surgery cause difficulty in patients' adaptation to the disease, an increase in the rate of encountering additional diseases, an increase in the need for anesthetic drugs, a negative impact on the surgical procedure and recovery process, and an increase in the feeling of pain in the postoperative period.

Pain is a threat to the body and creates a stress response in the body. This response causes an increase in the release of catecholamines and cortisol in the neuroendocrine system, which in turn causes many problems such as increased blood sugar, negative nitrogen balance,

hypertension, tachycardia, susceptibility to infection, delayed wound healing, increased oxygen consumption and decreased intestinal motility (Acar, Acar, Demir & Eti Aslan, 2016).

Increasing pain sensation also requires more analgesics (Dagli, et al., 2019). These analgesics include paracetamol, non-steroid anti-inflammatory drugs (NSAID), and opioid group drugs (Acar et al., 2016). These drugs have many side effects. Paracetamol drugs cause gastrointestinal bleeding renal and liver failure; opioids cause nausea, vomiting and, respiratory depression, cognitive and behavioral changes; and NSAIDs cause gastrointestinal bleeding (Aydınak, Yalçın & Abudayyak 2018; Dagli et al., 2019). Acar et al. showed that fear experienced before surgery increases patients' need for analgesia after surgery (Acar et al., 2016). With the addition of the fear of Covid 19, in addition to the existing fear of surgery, there will be a need for more analgesics.

All these reasons reveal the importance of determining the relationship between preoperative fear of COVID-19 in THA and TKA patients and preoperative anxiety and postoperative analgesic need. Therefore, the study was conducted to determine the relationship between fear of Covid-19 and preoperative anxiety and postoperative analgesic requirement in patients planned for THA and TKA.

MATERIALS AND METHODS

The descriptive and relation-seeking study was conducted in the orthopedic clinic of a hospital in eastern Turkey between March 30, 2022, and March 30, 2023. Before the study, ethical and clinical permissions were obtained. Ethical permission from İnönü University Health Sciences Non-Interventional Clinical Research Ethics Committee (29.03.2022/No: 2022/3197) and clinical permission from Orthopedics and Traumatology Clinic (E-50745807-770-156990), where the research was conducted" To protect patients' rights in the research, verbal and written permission was obtained from them before the data collection phase by the principle of informed consent. Additionally, the research was conducted by the principles of the Declaration of Helsinki.

In the Orthopedics and Traumatology Clinic, THA and TKA procedures are performed on an average of 182 patients annually (in line with the data received during the active period of the pandemic). The study was conducted with adult patients hospitalized in this clinic for THA or TKA surgery, had no psychiatric diagnosis, no communication barriers, and participated in the study voluntarily. Patients who met the research criteria were selected from the universe by a simple random sampling method. That means participants have equal chances

to join the study. To calculate the sample size of the study, g-power 3.1.9.7 was used. According to the previous study (Erlenwein et al., 2017) the sample size was determined as 127 patients with a 95% confidence interval and a 5% margin of error using the sampling method with a known population. The study was completed with 331 patients due to the increase in the rate of surgical interventions due to the decrease in the effects of the pandemic.

A questionnaire form prepared by the researchers, a COVID-19 Fear Scale, and the State Anxiety Inventory (STAI) were used to collect data. Since it was reported that pain was experienced more intensely in the first 48 hours postoperatively, pain measurements and analgesic use were made within the first 48 hours. The first pain assessment was made immediately after the surgery when the effect of anesthesia wore off (day 0), the second measurement was made 24 hours after the surgery, and the third measurement was made at the 48th hour. Pain assessment was performed using the Visual Analogue Pain Scale (VAS). During these measurements, analgesic drugs were administered to the patients, and daily usage frequencies and amounts were recorded.

Data Collection Tools

Personal Information Form, the Covid-19 Fear Scale, the State Anxiety Inventory, and Visual Analogue Pain Scale were used in data collection.

Personal Information Form

There are 13 questions in the form to determine the patient's sociodemographic characteristics and analgesic requirements, such as age, gender and marital status, surgery experience, pain history, and the type, amount, and frequency of analgesics administered.

Covid-19 Fear Scale

The scale (five likert; 1: Strongly disagree; 5: Strongly agree) developed by Ahorsu et al. (2020) consists of 7 questions. The total score on the scale varies between 7 and 35. The level of fear is scored based on the answers given to the questions, and it is stated that the higher the score, the higher the fear of Covid-19 (Ahorsu et al., 2020). Turkish validity and reliability of the scale were conducted in 2021, and the Cronbach alpha coefficient was found to be 0.82 (Bakioğlu, Korkmaz & Ercan, 2021). In this study, the Cronbach alpha coefficient was found to be 0.91.

State Anxiety Inventory (STAI)

The scale requires the individual to understand how he feels under certain conditions and at a time and to mark one of the options (1: Not at all, 2: A little, 3: A lot, and 4: Completely) according to the intensity of his feelings at the moment he reads the items. The scale has 20 items and two types of expressions (direct and reversed expressions). Direct statements describe negative emotions and cover questions 3, 4, 6, 7, 9, 12, 13, 14, 17, 18. Reversed statements describe positive emotions and cover questions 1, 2, 5, 8, 10, 11, 15, 16, 19, 20. Answers with a value of 4 for direct statements and 1 for reversed statements indicate high anxiety. The total score on the scale varies between 20-80, a score between "20-39" indicates a mild level, a score between "40-59" indicates a medium level, a score between "60-79" indicates a high level, and a score of "80" indicates a panic anxiety level (Ni, Tsai, Lee, Kao & Chen, 2012; Öner & Le Compte, 1998). The Turkish adaptation of the scale was made in 1998, and its reliability was determined to be between 0.83 and 0.92 (Öner & Le Compte, 1998). The reliability coefficient of this study was found to be 0.90.

Visual Analog Pain Scale

The scale used to measure pain includes a 10 cm long line, which aims to explain pain with numbers. On one end of this line is 0 (no pain), and on the other end is 10 (most severe). Patients are asked to mark the place on this 10 cm line corresponding to the pain intensity they feel. 1-4 points are interpreted as mild pain, 5-6 points as moderate pain, and 7-10 points as severe pain (Tulunay & Tulunay, 2000).

Statistical Analysis

Package in data analysis Statistical Package for the Social Sciences IBM 25.0 program was used, and the results were evaluated with a 95% confidence interval and a significance level of $P < 0.05$. The normality of the distribution of data was tested using the Kolmogorov-Smirnov test. Percentage, mean, and standard deviation values were used to analyze demographic data. Pearson correlation tests were used to determine the relationships between scales.

RESULTS

The sociodemographic characteristics of the patients are shown in Table 1. It was determined that 31.4% of the patients were in the age group of 70 and over, 66.2% were women, 84% were married, and 48.6% were literate. 52.0% of the patients had undergone TKA surgery,

53.8% did not have a chronic disease, 51.1% were constantly taking medication, 83.1% had previous surgery experience, and 36% had severe pain in their previous surgery. It was determined that patients experienced pain (Table 1).

Table 1. Distribution of Sociodemographic Characteristics of Patients (N = 331)

Sociodemographic Characteristics	S	%
Age (Mean±SD)		61.92±14.43
Gender		
Woman	219	66.2
Male	112	33.8
Marital status		
Married	278	84.0
Single	53	16.0
Educational Status		
Illiterate	124	37.5
Literate	161	48.6
Primary education	36	10.9
High school	10	3.0
Diagnosis		
Total Knee Arthroplasty	172	52.0
Total Hip Arthroplasty	159	48.0
Chronic Disease		
There is	153	46.2
None	178	53.8
Presence of Continuously Used Medicines		
Yes	169	51.1
No	162	48.9
Surgery Experience		
There is	275	83.1
None	56	16.9
Experiencing Pain in Previous Surgery		
Yes	248	74.9
No	83	25.1
Pain Intensity Experienced in Previous Surgery		
Light	98	29.6
Disturbing	114	34.4
Severe	119	36.0

Mean: Average; SD: Standard Deviation

The average postoperative analgesic requirement scores of the patients are shown in Table 2. The patients' average paracetamol dosage score on the zero-day was 1.40 ± 0.880 , their opioid dose average was 0.86 ± 0.713 , and their NSAID dose average was 1.31 ± 0.721 (Table 2).

Table 2. Postoperative Analgesic Use Status of Patients

Analgesic Usage *	Postoperative Day 0		Postoperative Day 1		Postoperative Day 2	
	Min-Max	Mean ± SD	Min-Max	Mean ± SD	Min-Max	Mean ± SD
Paracetamol Use	0-3	1.40 ± 0.88	0-3	1.26 ± 0.72	0-3	1.13 ± 0.62
Opioid Use	0-3	0.86 ± 0.71	0-3	0.50 ± 0.64	0-2	0.40 ± 0.52
NSAID Use	0-3	1.31 ± 0.72	0-3	1.11 ± 0.70	0-3	0.89 ± 0.57

* Analgesics were recorded according to the frequency of use per day. Min-Max: Minimum and maximum values; Mean: Average; SD: Standard Deviation

The scores that the patients received from the scales are shown in Table 3. It was determined that the patient's state anxiety score was 39.39 ± 4.83 , their fear mean score was 14.81 ± 6.85 , and their first-day VAS mean score was 9.27 ± 1.13 (Table 3).

Table 3. Patients' Scores from the Scales

	Min-Max	Mean \pm SD
State Anxiety Score	27-51	39.39 \pm 4.83
Covid-19 Fear Score	7-33	14.81 \pm 6.85
Postoperative Day 0 VAS	5-10	9.27 \pm 1.13
Postoperative Day 1 VAS	3-10	7.64 \pm 1.47
Postoperative Day 2 VAS	1-9	6 \pm 1.74

Min-Max: Minimum and maximum values; Mean: Average; SD: Standard Deviation

Patients' preoperative Covid-19 fears and their anxiety are shown in Table 4. Pearson's difference between the two scales' correlation (r) value was -0.81. Accordingly, no statistically significant relationship was detected between the scale score averages ($p > 0.05$) (Table 4).

Table 4. Relationship between Covid-19 Fear Score and State Anxiety

Variables	Mean \pm SD	Covid-19 Fear Score	State Anxiety Score
Covid-19 Fear Score	14.81 \pm 6.85	1	
State Anxiety Score	39.39 \pm 4.83	-0.81	1

Mean: Average; SD: Standard Deviation; Pearson Correlation $p < 0.05$

The relationship between Covid-19 odor and postoperative analgesic requirement is shown in Table 5. Accordingly, while there is a weak positive relationship between fear of Covid-19 and opioids used on the first and second days after surgery and NSAID on the first day and first and second days, there is a negative significant relationship between paracetamol use on the first and second days was detected ($p < 0.05$) (Table 5).

Table 5. Relationship between Fear of Covid-19 and Postoperative Analgesic Requirement

Variables	Fear of Covid-19	Opioid Use			NSAID Use			Paracetamol Use		
		0 Day	1 Day	2 Day	0 Day	1 Day	2 Day	0 Day	1 Day	2 Day
Fear of Covid-19	1									
Opioid Use										
0 Day	.067	1								
1 Day	.179**	.569**	1							
2 Day	.140*	.480**	.741*	1						
NSAID Use										
0 Day	.159**	.186**	.193*	.058	1					
1 Day	.191**	.149**	.149*	.040	.553**	1				

2 Day	.196**	.118*	.124*	.054	.585**	.658**	1			
Paracetamol Use										
0 Day	.087	.158**	.056	-.032	.119*	-.045	.063	1		
1 Day	-.111*	.153**	-.097	.111*	.021	.184**	-.054	.653**	1	
2 Day	-.172**	.060	-.084	.145**	-.041	.248	.120*	.607**	.802*	1

Pearson Correlation *p<0.05, **p<0.01

DISCUSSION

THA and TKA patients who are reported to experience anxiety and fear before surgery (Aşçı, 2019; Duivenvoorden et al., 2013; Mete & Avcı Işık, 2019) may have increased anxiety levels and postoperative analgesic requirements due to fear of Covid-19. However, no study was found in the literature examining the effect of Covid-19 fear on preoperative anxiety and postoperative analgesic requirement in THA and TKA patients. Therefore, the study results were discussed with similar literature information.

It is reported in the literature that the preoperative Covid-19 fear level of patients scheduled for surgery is generally above the moderate level and that they are afraid of catching Covid-19 (Doğan, Kaplan Serin & Bağcı, 2021; Işıklı, Özkan & Buberka, 2022; Montalto et al., 2021). However, it is stated that patients during the surgery process experience a higher fear of Covid-19, especially on days when the pandemic is active, and that the epidemic causes other negative emotional states in patients scheduled for surgery (Doğan et al., 2021; Işıklı et al., 2022; Montalto et al., 2021). This study found that the preoperative Covid-19 fear levels of arthroplasty patients were below the moderate level (Table 3) and that the fear of Covid-19 was not associated with preoperative anxiety (Table 4). This is a pleasing result, but it does not change the fact that the fear experienced in the event of new epidemics may increase the level of anxiety. Because when the perceived danger disappears, the symptoms of fear disappear (Şahin, 2019). The fact that the study data were obtained when the effects of the Covid-19 pandemic began to decrease, many vaccines for Covid-19 were produced, and vaccination rates were high may be the reason for this result. What should not be forgotten is that new variants of the Covid-19 disease, which has caused the death of nearly seven million individuals, are still seen, and the possibility of an epidemic continues (WHO, 2024). In this context, the fact that other possible epidemics may occur in the future reveals the importance of the findings of this study.

It is reported in the literature patients experience intense pain after THA and TKA interventions (Aşçı, 2019; Baskan et al., 2020; Demir & Erdil, 2013; Liu et al., 2012). Similar to the literature, it was determined that patients in this study experienced intense pain in the postoperative period (Table 3). Severe pain experienced after hip and knee arthroplasty may cause delayed mobilization, inability to perform exercises effectively, and increased complications (Acar et al., 2016; Aşçı, 2019; Demir & Erdil, 2013; Gürarlan Baş et al., 2016; Liu et al., 2012; Meissner et al., 2008). This information reveals the importance of pain control in THA and TKA patients.

With this reported in the literature that fears experienced before surgery cause postoperative pain to be more intense and become chronic (Dagli et al., 2019; Lavernia, Alcerro & Rossi, 2020; Mete & Avcı Işık, 2019; Turksal, Alper, Sergin, Yuksel & Ulukaya, 2020). As the pain increases, the need for painkillers also increases (Acar et al., 2016; Dağlı et al., 2019). No study in the literature shows the effect of fear of COVID-19 on postoperative analgesic requirements in THA and TKA patients; however, it is reported that the need for analgesics before surgery increases (Farrow et al., 2023). In this study, similar to the literature, it was found that patients used high amounts of analgesics, especially on the zeroth day and the first day (Table 2), and it was determined that the use of opioid and NSAID analgesics increased after surgery as the patients' pre-operative COVID-19 fear level increased (Table 5).

The fact that these drugs used in high doses have many side effects (Aydınak et al., 2017) makes it necessary to identify and control factors that may affect the pain level of patients, such as fear, in order to reduce drug doses and frequency of use. Considering the adverse effects of intense pain (Acar et al., 2016; Aşçı, 2019; Ay & Alpar, 2010; Demir & Erdil, 2013; Gürarlan Baş et al., 2016; Meissner et al., 2008; Liu et al., 2012) and excessive analgesic use (Aydınak et al., 2017), this result is noteworthy as it shows the necessity of controlling the level of fear before surgery. It was found that there was a negative relationship between the increase in the level of fear of COVID-19 and the use of paracetamol medication, which was found as a different finding in this study (Table 5). Paracetamol group drugs have analgesic and antipyretic properties and are used for lower-level pain (Ennis, Dideriksen, Vægter, Handberg & Pottegård, 2016; Issa, Zayed & Habib, 2010). The use of opioids and NSAIDs primarily in the treatment of patients in this study group due to the intense pain experienced may explain the less use of paracetamol drugs.

CONCLUSION

It was determined that the patients had a below level of fear of Covid-19 before the surgery and that this fear was not related to preoperative anxiety. Along with this, it was determined that the fear of Covid-19 preoperative increased the use of opioids and NSAID group analgesics postoperative. These results show the importance of controlling patients' fear levels during the preoperative period.

In line with these results, it is recommended that surgical nurses who care for patients during the perioperative process should conduct a more comprehensive psychological evaluation, being aware of the additional anxiety and fear of patients during epidemic periods.

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