

Preoperative Surgical Fear, Anxiety, Depression, and Pain in Orthopedic Patients: A Cross-Sectional Comparison of Trauma and Elective Surgery

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Cite as: Kahraman HÇ, Bakar Kahraman B, Karamolla AS, Tanoğlu O, Yılmaz B. Preoperative surgical fear, anxiety, depression, and pain in orthopedic patients: a cross-sectional comparison of trauma and elective surgery. Forbes J Med. 2026;7:157-64

ABSTRACT

Objective: Orthopedic surgery patients may experience substantial physical and psychological burden, including pain, anxiety, depressive symptoms, and surgical fear, which may influence perioperative recovery. To compare preoperative surgical fear between trauma-related and elective orthopedic surgery patients and to examine associations of short- and long-term surgical fear with anxiety, depressive symptoms, and pain.

Methods: Consecutive patients aged ≥18 years undergoing trauma-related or elective orthopedic surgery at University of Health Sciences Türkiye, Fatih Sultan Mehmet Training and Research Hospital were enrolled. Participants completed the surgical fear questionnaire (SFQ), the hospital anxiety and depression scale (HADS), and the visual analog scale (VAS) one day before surgery.

Results: A total of 142 patients were analyzed (trauma, n=64; elective, n=78). Preoperative length of stay and VAS scores were higher in the trauma group. No statistically significant differences between groups were detected for short-term, long-term, or total SFQ scores. Short-term fear correlated with HADS anxiety ($p=0.480$, $q<0.001$), whereas long-term fear correlated with both HADS anxiety ($p=0.476$, $q<0.001$) and HADS depression ($p=0.435$, $q<0.001$). In multivariable analyses using HC3 robust standard errors, higher HADS anxiety and female sex were independently associated with greater short-term fear, whereas higher HADS anxiety and HADS depression were independently associated with greater long-term fear. Trauma/elective status was not independently associated with either of the fear dimensions.

Conclusion: Short- and long-term surgical fear were more strongly associated with psychological characteristics than with surgical indication. Anxiety was associated with both fear dimensions; female sex was associated with short-term fear, and depressive symptoms were associated with long-term fear. These findings support consideration of psychological assessment in preoperative orthopedic care.

Keywords: Trauma, arthroplasty, surgery, fear, anxiety, depression

Received: 13.04.2026

Accepted: 24.09.2026

Publication Date: 09.10.2026

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INTRODUCTION

Orthopedics and traumatology encompass a wide range of surgical procedures, and patients may experience substantial physiological and psychological stress throughout treatment and recovery. Factors influencing outcomes in orthopedic patients are not limited to implant selection, fracture characteristics, or surgical

technique. Pain, adherence to rehabilitation, patient satisfaction, and functional recovery may also be influenced by psychological factors. Orthopedic injuries can impose a considerable physical and psychological burden, contributing to pain, functional limitations, and impaired quality of life.^{1,2} Understanding the psychological burden associated with orthopedic trauma is therefore important for improving perioperative care and rehabilitation.³



Surgical fear includes short- and long-term concerns related to surgery, anesthesia, pain, postoperative adverse effects, complications, loss of independence, recovery, and unfavorable outcomes. The surgical fear questionnaire (SFQ) was developed to assess these dimensions systematically and has subsequently been adapted and validated in Turkish surgical populations.^{4,5} Identifying factors associated with greater preoperative surgical fear may help clinicians recognize patients who could benefit from additional psychological assessment or perioperative support.

Illness and surgical treatment may also contribute to anxiety and depressive symptoms. Pronounced preoperative anxiety has been associated with adverse perioperative experiences and poorer recovery-related outcomes.^{6,7} Pain may further interact with emotional distress and surgical fear, particularly in orthopedic patients in whom pain frequently represents a major component of the presenting condition. Previous studies have evaluated surgical fear in orthopedic and other surgical populations,⁸⁻¹⁰ but direct comparisons between trauma-related and elective orthopedic surgery remain limited.

We hypothesized that patients undergoing trauma-related orthopedic surgery would have higher short-term surgical fear than those undergoing elective orthopedic surgery because of the acute onset, uncertainty, and sudden functional impairment associated with traumatic injury. The primary objective of this study was to compare short-term preoperative surgical fear between patients undergoing trauma-related orthopedic surgery and those undergoing elective orthopedic surgery. The secondary objectives were to compare long-term surgical fear between the groups and to examine its associations with anxiety, depressive symptoms, preoperative pain, and selected demographic and clinical characteristics.

METHODS

Ethical approval was obtained from the Ethical approval was obtained from the University of Health Sciences Türkiye, Koşuyolu Yüksek İhtisas Training and Research Hospital Ethics Committee (decision no: 2026/04/1386, date: 24.02.2026), as our hospital did not have a local ethics committee. Participant recruitment began after ethical approval had been obtained. The study was conducted in accordance with the Declaration of Helsinki and written informed consent was obtained from all participants prior to participation in the study. All study data were anonymized and used solely for scientific purposes.

The inclusion criteria were age ≥ 18 years; sufficient cognitive ability to comprehend and respond to the study instruments; ability to read and understand Turkish; willingness to participate voluntarily; and an appropriate preoperative clinical condition to complete the data collection form, SFQ, hospital anxiety and depression scale (HADS), and visual analog scale (VAS).

The exclusion criteria were emergency surgery, including cases carrying the American Society of Anesthesiologists (ASA) physical

status “E” emergency modifier; age < 18 years; severe cognitive impairment or a neurological or psychiatric condition interfering with effective communication; inability to read or understand Turkish; refusal to participate; incomplete study scales; inability to undergo standard preoperative assessment because of clinical instability; and missing study data.

This single-center, cross-sectional, observational study included 142 consecutive adult patients undergoing trauma-related or elective orthopedic surgery at the Orthopedics and Traumatology Clinic between February 26, 2026, and April 30, 2026. All assessments were performed at a single time point, one day before surgery.

A standardized data collection form was used to record demographic and clinical characteristics, including age, sex, educational level, marital status, number of children, place of residence, occupation, income level, caregiver or companion status, previous hospitalization, previous surgery, chronic diseases, ASA physical status classification, length of preoperative hospital stay, and preoperative pain intensity. Pain intensity was assessed using a 0-10 VAS.

The SFQ, developed by Theunissen et al.⁴ and adapted into Turkish by Bağdigen and Karaman Özlü,⁵ is an eight-item instrument assessing short- and long-term surgical fear. Each item is scored from 0 to 10, resulting in a total score ranging from 0 to 80, with higher scores indicating greater surgical fear. Four items assess short-term fear related to the immediate surgical and early perioperative period, while four assess long-term concerns related to recovery, surgical outcomes, and possible long-term consequences.

The HADS was developed for the assessment of anxiety and depressive symptoms in medical populations while minimizing the contribution of somatic symptoms. Its validity and reliability have been established in the Turkish population.¹¹ The HADS consists of 14 self-report items divided into two seven-item subscales: HADS-anxiety (HADS-A) and HADS-depression (HADS-D). Each subscale ranges from 0 to 21, with higher scores indicating greater symptom severity.

SFQ, HADS, and VAS assessments were completed during hospitalization in the patients’ rooms under standardized conditions. In the elective surgery group, ASA classification was established before admission. In patients undergoing trauma-related surgery, ASA classification was determined during hospitalization following preoperative anesthetic evaluation. Preoperative length of hospital stay was defined as the interval from hospital admission to the day of surgery.

An a priori sample size analysis was performed using G*Power version 3.1. The calculation was based on the primary comparison of surgical fear between the trauma and elective groups. The sample size calculation was based on the between-group comparison of the primary short-term SFQ score. For a two-

sided comparison between two independent groups, assuming a medium standardized effect size (Cohen's $d=0.50$), an alpha level of 0.05, and statistical power of 80%, the required total sample size was 128 participants (64 per group). A larger sample was targeted to account for possible exclusions or incomplete data.

Statistical Analysis

Statistical analyses were performed using (version 24.0; IBM Corp., Armonk, NY, USA), with additional Python-based routines for robust inference, bootstrap confidence intervals (CIs), and false discovery rate adjustment. Continuous variables were assessed for normality and summarized as mean $\pm$ standard deviation or median (IQR), as appropriate; categorical variables were reported as n (%).

Between-group comparisons were performed using the Mann-Whitney U test for continuous variables and the chi-square test or, when required, exact tests for categorical variables. Rank-biserial correlations with bootstrap 95% CIs were reported as effect sizes. Associations among age, HADS-A, HADS-D, SFQ scores, and VAS were evaluated using Spearman correlation coefficients, with Benjamini-Hochberg correction applied to the 15 exploratory comparisons.

Separate multivariable linear regression models were constructed for short- and long-term surgical fear using age, sex, marital status, previous surgery, preoperative length of stay, trauma/elective status, HADS-D, HADS-A, and VAS as covariates. For regression analyses, sex was coded as female = 0 and male = 1; marital status as single = 0 and married = 1; surgical group as elective = 0 and trauma = 1; and previous surgery as none = 0 and one or more previous operations = 1. Regression assumptions were assessed using residual diagnostics, VIF and tolerance, the Ramsey RESET test, the Breusch-Pagan test, and Cook's distance. Because heteroscedasticity was detected in the long-term model, HC3 robust standard errors were used for both models. Sensitivity analyses included ASA classification and caregiver status. All tests were two-sided; $p < 0.05$ was considered statistically significant, while exploratory correlations were interpreted based on adjusted $q < 0.05$.

RESULTS

A total of 142 patients met the eligibility criteria and were included in the analysis, comprising 64 undergoing trauma-related orthopedic surgery and 78 undergoing elective orthopedic surgery.

Demographic and clinical characteristics are presented in Table 1. Significant between-group differences were observed in marital status, number of children, caregiver status, history of hospitalization, history of surgery, and ASA classification. In contrast, sex, education, place of residence, occupation, income level, and chronic disease status did not differ significantly between the groups.

Table 1. Comparison of demographic and clinical characteristics between the trauma and elective surgery groups

Variable	Trauma, n (%)	Elective, n (%)	p
Sex			0.145
Female	35 (54.7)	52 (66.7)	
Male	29 (45.3)	26 (33.3)	
Education level			0.222
Primary school	24 (37.5)	38 (48.7)	
Middle school	10 (15.6)	12 (15.4)	
High school	22 (34.4)	15 (19.2)	
Undergraduate degree	8 (12.5)	11 (14.1)	
Master's degree	0	2 (2.6)	
Marital status			<0.001
Single	34 (53.1)	15 (19.2)	
Married	30 (46.9)	63 (80.8)	
Number of children			0.020
None	26 (40.6)	16 (20.5)	
One child	10 (15.6)	13 (16.7)	
Two children	17 (26.6)	20 (25.6)	
≥ 3 children	11 (17.2)	29 (37.2)	
Place of residence			0.112
City	62 (96.9)	69 (88.5)	
District/town/village	2 (3.1)	9 (11.6)	
Occupation			0.050
Housewife	19 (29.7)	40 (51.3)	
Worker	6 (9.4)	7 (9.0)	
Self-employed	11 (17.2)	9 (11.5)	
Retired	10 (15.6)	13 (16.7)	
Unemployed	8 (12.5)	2 (2.6)	
Other	10 (15.7)	7 (8.9)	
Income level			0.671
Low	5 (7.8)	8 (10.3)	
Middle	57 (89.1)	69 (88.5)	
High	2 (3.1)	1 (1.3)	
Caregiver/companion			0.001
None	9 (14.1)	0	
Spouse	18 (28.1)	27 (34.6)	
Child	11 (17.2)	29 (37.2)	
Parent(s)	14 (21.9)	10 (12.8)	
Other	12 (18.8)	12 (15.4)	
History of previous hospitalization			<0.001
None	26 (40.6)	16 (20.5)	
Once	6 (9.4)	28 (35.9)	
Twice	9 (14.1)	11 (14.1)	
≥ 3 times	23 (35.9)	23 (29.5)	

Table 1. Continued			
Variable	Trauma, n (%)	Elective, n (%)	p
History of previous surgery			0.039
None	27 (42.2)	20 (25.6)	
Once	14 (21.9)	31 (39.7)	
Twice	23 (35.9)	27 (34.6)	
History of chronic disease			0.081
No	34 (53.1)	30 (38.5)	
Yes	30 (46.9)	48 (61.5)	
ASA classification			<0.001
ASA I	9 (14.1)	9 (11.5)	
ASA II	25 (39.1)	28 (35.9)	
ASA III	8 (12.5)	36 (46.2)	
ASA IV	22 (34.4)	5 (6.4)	
Data are presented as n (%). Pearson's chi-square test was used when assumptions were satisfied. Fisher's exact test or Fisher-Freeman-Halton exact testing was used for sparse tables. Exact/Monte Carlo testing was used for education level, place of residence, occupation, income level, and caregiver/companion status. A two-sided p<0.05 was considered statistically significant. ASA: American Society of Anesthesiologists			

Preoperative length of hospital stay was significantly longer in the trauma group than in the elective group [3 (2-3) vs. 1 (1-1) days, $p<0.001$], with a large rank-biserial effect size ($r_{rb}=0.838$, 95% CI 0.743 to 0.922). Preoperative VAS scores were also higher in the trauma group [7 (6-9) vs. 6 (4-7), $p=0.001$; $r_{rb}=0.322$, 95% CI 0.147 to 0.498].

No statistically significant between-group difference was detected in short-term surgical fear [23 (12-24) vs. 17 (10-25), $p=0.175$; $r_{rb}=0.132$, 95% CI -0.051 to 0.324], long-term surgical fear [20.5 (10.5-27) vs. 16.5 (11.5-24), $p=0.112$; $r_{rb}=0.155$, 95% CI -0.039 to 0.346], or total surgical fear [44 (28.25-50) vs. 34 (18-47), $p=0.095$; $r_{rb}=0.163$, 95% CI -0.030 to 0.354]. HADS-A, HADS-D, and total

HADS scores also did not differ significantly between the groups (Table 2).

In exploratory Spearman correlation analyses with Benjamini-Hochberg adjustment, HADS-D was positively associated with short-term surgical fear ($p=0.368$, $q<0.001$) and long-term surgical fear ($p=0.435$, $q<0.001$). HADS-A was positively associated with both short-term fear ($p=0.480$, $q<0.001$) and long-term fear ($p=0.476$, $q<0.001$). Short- and long-term surgical fears were strongly correlated ($p=0.739$, $q<0.001$).

The VAS score showed weak positive correlations with HADS-D ($p=0.190$, $q=0.030$), HADS-A ($p=0.322$, $q<0.001$), short-term fear ($p=0.198$, $q=0.025$), and long-term fear ($p=0.205$, $q=0.022$). Age was weakly associated with short-term fear ($p=0.206$, $q=0.022$) and with VAS score ($p=0.226$, $q=0.013$), whereas its association with HADS-A did not remain statistically significant after FDR adjustment ($p=0.160$, $q=0.067$) (Table 3).

Regression diagnostics showed no evidence of substantial multicollinearity, with VIF values ranging from 1.29 to 2.72 and tolerance values ranging from 0.367 to 0.775. The Ramsey RESET test did not indicate any relevant model misspecification for either short-term surgical fear ($p=0.676$) or long-term surgical fear ($p=0.514$). The maximum Cook's distance was 0.092 for the short-term model and 0.049 for the long-term model, indicating that there were no highly influential observations. The Breusch-Pagan test did not indicate heteroscedasticity in the short-term model ($p=0.273$), but did indicate heteroscedasticity in the long-term model ($p=0.036$); therefore, HC3 robust standard errors were used for both models.

The multivariable model for short-term surgical fear explained 37.6% of the variance ($R^2=0.376$; adjusted $R^2=0.333$). Higher HADS-A scores were independently associated with higher short-term surgical fear ($B=1.167$, $\beta=0.447$, HC3 SE=0.259, $p<0.001$, 95% CI 0.655 to 1.678). Male sex was associated with lower short-term surgical fear scores compared with female sex ($B=-4.879$, $\beta=-$

Table 2. Comparison of continuous clinical and psychological variables between the trauma and elective surgery groups					
Variable	Trauma (n=64), median (Q1-Q3)	Elective (n=78), median (Q1-Q3)	p	Rank-biserial r	95% CI
Age	56.5 (27.25-74)	61.5 (42-67.25)	0.925	-0.009	-0.225 to 0.199
Preoperative length of stay	3 (2-3)	1 (1-1)	<0.001	0.838	0.743 to 0.922
Depression score	9 (6-11)	8 (5-10)	0.083	0.168	-0.022 to 0.359
Anxiety score	9 (7-11.75)	8 (6-11.25)	0.163	0.136	-0.057 to 0.323
Total HADS score	19 (11-22.75)	17 (12-21)	0.161	0.137	-0.053 to 0.322
Short-term fear	23 (12-24)	17 (10-25)	0.175	0.132	-0.051 to 0.324
Long-term fear	20.5 (10.5-27)	16.5 (11.5-24)	0.112	0.155	-0.039 to 0.346
Total fear score	44 (28.25-50)	34 (18-47)	0.095	0.163	-0.030 to 0.354
VAS score	7 (6-9)	6 (4-7)	0.001	0.322	0.147 to 0.498
Group comparisons were performed using the Mann-Whitney U test. Rank-biserial correlation was used as the effect-size measure; positive values indicate higher ranks in the trauma group. CIs are bootstrap 95% confidence intervals. HADS: Hospital anxiety and depression scale, VAS: Visual analog scale, CI: Confidence interval					

0.247, HC3 SE=1.699, $p=0.005$, 95% CI -8.239 to -1.518), indicating higher adjusted short-term fear among women. Previous surgery, trauma/elective status, age, marital status, preoperative length of stay, HADS-D, and VAS were not significantly associated with short-term fear (Table 4).

The multivariable model for long-term surgical fear explained 31.9% of the variance ($R^2=0.319$; adjusted $R^2=0.272$). Higher

HADS-A scores ($B=1.118$, $\beta=0.371$, HC3 SE=0.337, $p=0.001$, 95% CI 0.451 to 1.785) and higher HADS-D scores ($B=0.651$, $\beta=0.228$, HC3 SE=0.289, $p=0.026$, 95% CI 0.080 to 1.223) were independently associated with increased long-term surgical fear. Trauma/elective status, sex, previous surgery, age, marital status, preoperative length of stay, and VAS were not significantly associated with long-term fear (Table 5).

Table 3. Correlations between age, psychological measures, surgical fear dimensions, and pain severity

Variable	1	2	3	4	5	6
1. Age	-					
2. Depression score	0.032	-				
3. Anxiety score	0.160	0.574**	-			
4. Short-term fear	0.206*	0.368**	0.480**	-		
5. Long-term fear	0.076	0.435**	0.476**	0.739**	-	
6. VAS score	0.226*	0.190*	0.322**	0.198*	0.205*	-

Data are Spearman's rho (ρ) coefficients. Significance was determined after Benjamini-Hochberg false discovery rate adjustment across the 15 unique pairwise correlations. * $q<0.05$; ** $q<0.01$. VAS: Visual analog scale

Table 4. Multivariable linear regression analysis of factors associated with short-term surgical fear

Variable	B	HC3 robust SE	β	p	95% CI
Age	0.003	0.055	0.006	0.957	-0.107 to 0.112
Male sex vs. female	-4.879	1.699	-0.247	0.005	-8.239 to -1.518
Married vs. single	-0.851	2.248	-0.042	0.706	-5.298 to 3.596
Previous surgery ≥ 1 vs. none	2.732	1.731	0.134	0.117	-0.692 to 6.156
Trauma vs. elective	3.940	2.478	0.204	0.114	-0.963 to 8.842
Preoperative length of stay	-1.245	0.908	-0.141	0.172	-3.040 to 0.550
HADS-D	0.204	0.257	0.082	0.429	-0.305 to 0.712
HADS-A	1.167	0.259	0.447	<0.001	0.655 to 1.678
VAS	-0.114	0.380	-0.028	0.765	-0.865 to 0.638

$R^2=0.376$; adjusted $R^2=0.333$. B: Unstandardized regression coefficient, β : Standardized regression coefficient, HC3 SE: Heteroscedasticity-consistent robust standard error, CI: Confidence interval, HADS-D: Hospital anxiety and depression scale-depression, HADS-A: Hospital anxiety and depression scale-anxiety, VAS: Visual analog scale. Reference categories: female sex, single marital status, no previous surgery, and elective surgery

Table 5. Multivariable linear regression analysis of factors associated with long-term surgical fear

Variable	B	HC3 robust SE	β	p	95% CI
Age	-0.053	0.066	-0.098	0.422	-0.183 to 0.077
Male sex vs. female	-0.366	1.881	-0.016	0.846	-4.086 to 3.354
Married vs. single	2.008	2.861	0.086	0.484	-3.652 to 7.667
Previous surgery ≥ 1 vs. none	2.779	2.080	0.118	0.184	-1.336 to 6.895
Trauma vs. elective	2.598	2.974	0.117	0.384	-3.284 to 8.480
Preoperative length of stay	-0.332	1.141	-0.032	0.772	-2.589 to 1.925
HADS-D	0.651	0.289	0.228	0.026	0.080 to 1.223
HADS-A	1.118	0.337	0.371	0.001	0.451 to 1.785
VAS	-0.071	0.400	-0.015	0.859	-0.863 to 0.720

$R^2=0.319$; adjusted $R^2=0.272$. B: Unstandardized regression coefficient, β : Standardized regression coefficient, HC3 SE: Heteroscedasticity-consistent robust standard error, CI: Confidence interval, HADS-D: Hospital anxiety and depression scale-depression, HADS-A: Hospital anxiety and depression scale-anxiety, VAS: Visual analog scale. Reference categories: female sex, single marital status, no previous surgery, and elective surgery

Sensitivity analyses that additionally adjusted for ASA classification and caregiver status did not materially alter the principal findings. Trauma/elective status remained not significantly associated with either short-term fear ($B=3.616$, $p=0.172$) or long-term fear ($B=1.365$, $p=0.672$). Female sex remained associated with higher short-term fear ($p=0.005$), and HADS-A remained associated with short-term fear ($p<0.001$). For long-term fear, HADS-A ($p=0.008$) and HADS-D ($p=0.014$) remained statistically significant. Previous surgical history was not significant in either sensitivity model ($p=0.115$ and $p=0.152$, respectively).

DISCUSSION

The principal finding of this study was that there were no statistically significant differences between patients undergoing trauma-related and those undergoing elective orthopedic surgery in short-term, long-term, or total preoperative surgical fear. In contrast, patients in the trauma group had substantially longer preoperative hospital stays and higher preoperative pain scores. The multivariable analyses further showed that HADS-A was independently associated with both short- and long-term surgical fear; that female sex was independently associated with greater short-term fear; and that HADS-D was independently associated with greater long-term fear. Trauma/elective status was not independently associated with either fear dimension.

Importantly, the absence of statistically significant between-group differences should not be interpreted as evidence that trauma and elective patients are equivalent with respect to surgical fear. The study was designed for a conventional two-group comparison and did not include a prespecified equivalence margin. The small rank-biserial effect sizes for short-term, long-term, and total surgical fear, along with their CIs, provide information on the magnitude and precision of the observed differences, but do not establish formal equivalence.

The demographic and clinical profiles of the trauma and elective groups differed substantially. Orthopedic trauma populations encompass a broad spectrum of injury mechanisms, age groups, and levels of systemic burden,¹²⁻¹⁵ whereas elective orthopedic populations commonly include older patients undergoing treatment for chronic degenerative conditions.^{16,17} In this cohort, there was no statistically significant age difference between groups, which may reflect the heterogeneous composition of the trauma group and the inclusion of both younger and older patients.

The two groups also differed in marital status, number of children, caregiver status, previous hospitalization, previous surgery, and ASA classification. Caregiver availability may differ between unplanned trauma-related admissions and planned elective surgeries because patients undergoing elective procedures have more opportunity to organize social support before hospitalization. Caregiver burden and the contributions of spouses and family members have previously been described in patients undergoing

treatment for hip fracture and in those undergoing elective joint replacement.¹⁸⁻²⁰ These baseline differences highlight the clinical heterogeneity of the two groups and support the use of adjusted analyses and sensitivity analyses, rather than interpretations based solely on crude group comparisons.

ASA distributions also differed markedly between groups. This difference may reflect variation in underlying systemic disease and case mix rather than the trauma/elective classification alone. ASA status has been associated with outcomes in orthopedic populations, including patients with hip fracture.²¹ Nevertheless, additional adjustment for ASA classification and caregiver status did not materially change the associations observed in the primary multivariable analyses.

Surgical fear is a multidimensional psychological response that reflects concerns regarding the immediate surgical process, recovery, and longer-term outcomes. Studies using the SFQ in different surgical populations have demonstrated substantial variation in fear according to patient characteristics, psychological burden, and surgical context.^{4,22-24} The present findings suggest that simply categorizing orthopedic surgery as trauma-related or elective may provide limited information regarding an individual patient's preoperative fear. Despite greater pain and longer hospitalization in the trauma group, trauma/elective status was not significantly associated with either fear dimension after adjustment.

HADS-A showed the strongest independent association with short-term surgical fear and was also independently associated with long-term surgical fear. This finding is consistent with previous evidence showing close relationships between preoperative anxiety, fear, worry, and perioperative psychological burden.^{6,7,24} Although anxiety and surgical fear are related constructs, the SFQ specifically captures fear directed toward surgical and recovery-related consequences, whereas HADS-A measures broader anxiety symptoms. Their independent clinical assessment may, therefore, provide complementary information.

Depressive symptoms showed a different pattern. HADS-D was not independently associated with short-term fear but was associated with long-term surgical fear. Long-term SFQ items focus more strongly on recovery, functional outcomes, and possible adverse consequences after surgery. Cognitive models of depression emphasize negative expectations, pessimistic appraisal, and increased focus on unfavorable future outcomes,²⁵ which may partly explain why depressive symptoms were more strongly associated with long-term than immediate surgical concerns. However, because both variables were measured at the same preoperative time point, the present study cannot establish directionality or causality.

Preoperative length of hospital stay differed markedly between the groups but was not independently associated with either dimension of surgical fear. Previous studies have shown that waiting periods immediately before surgery or in the operating

room may influence anxiety and surgical fear.²⁶ The variable examined in the present study represented the hospital stay from admission to surgery, rather than the waiting time in the operating area. These measures therefore reflect different aspects of the perioperative process. In elective arthroplasty pathways, changes in perioperative organization may also considerably shorten hospitalization.²⁷ A more detailed evaluation of waiting-related variables may be useful in prospective studies.

Surgical history was also not independently associated with short- or long-term fear when previous operations were analyzed as a clinically interpretable binary variable. Prior surgical exposure may have heterogeneous psychological effects. Familiarity with the surgical process may reduce uncertainty in some patients, whereas negative previous experiences may increase fear in others.^{10,22} The present data do not support treating previous surgery itself as an independent marker of increased surgical fear.

Female sex was independently associated with greater short-term, but not long-term, surgical fear. Sex-related differences in preoperative fear have been reported in surgical populations, although the magnitude and dimensions of these associations vary across studies.^{10,22} In the present study, the association was specific to short-term concerns, suggesting that sex-related differences may be more apparent for immediate fears surrounding surgery and anesthesia than for longer-term recovery-related concerns.

Pain showed weak bivariate associations with both fear dimensions and anxiety and depressive symptoms. However, VAS score was not independently associated with either short- or long-term fear in the multivariable models. Pain is an important component of the orthopedic perioperative experience and has been associated with psychological and postoperative outcomes,²⁸ but the present findings indicate that preoperative anxiety and depressive symptoms showed stronger adjusted associations with surgical fear than pain intensity in the multivariable models.

These findings have practical implications for preoperative assessment. Rather than relying solely on trauma or elective indications, pain severity, or previous surgical exposure to identify patients with greater surgical fear, clinicians may benefit from directly considering psychological symptoms. Structured preoperative education has been associated with reductions in anxiety in patients undergoing elective hip and knee arthroplasty,²⁹ and individualized education and psychological support may help reduce uncertainty and improve preparedness for surgery.

A multidisciplinary approach may be particularly relevant in orthopedic care, where physical injury, pain, function, social support, and mental health frequently interact. Reviews of orthopedic trauma care have emphasized the importance of integrating psychosocial assessment and support with conventional orthopedic treatment.^{3,30} The present findings suggest that such assessment should not be limited to trauma patients but should

be considered based on individual psychological needs across both trauma-related and elective surgical populations.

Study Limitations

This study has several limitations. Its single-center, cross-sectional design limits generalizability and precludes establishing causal or temporal relationships. The trauma and elective groups were clinically heterogeneous, and residual confounding may remain despite multivariable and sensitivity analyses. Detailed trauma characteristics, including mechanism and injury severity, were not available. Emergency cases were excluded, which may limit the applicability of the findings to more severe trauma populations. In addition, SFQ, HADS, and VAS were self-reported and assessed at a single preoperative time point. The study was powered to detect a medium between-group effect; therefore, smaller clinically relevant differences cannot be excluded. Other potentially important factors, including previous surgical experiences, social support, perioperative information needs, personality characteristics, and patient–physician communication, were not comprehensively assessed.

CONCLUSION

In this cross-sectional study, no statistically significant differences were detected in short-term, long-term, or total preoperative surgical fear between patients undergoing trauma-related orthopedic surgery and those undergoing elective orthopedic surgery. These findings should not be interpreted as demonstrating equivalence between the groups. Higher levels of anxiety symptoms were independently associated with both short- and long-term surgical fear. Female sex and depressive symptoms were independently associated with greater short-term and long-term fear, respectively. Trauma versus elective surgical status, surgical history, preoperative pain, and preoperative length of hospital stay were not independently associated with either of the fear dimensions after multivariable adjustment. These findings indicate that individual psychological characteristics may provide clinically relevant information beyond the surgical indication alone. Preoperative assessment of anxiety, depressive symptoms, and surgical fear may help identify patients who could benefit from individualized psychological support or preoperative education. Prospective longitudinal studies are required to determine whether these associations influence postoperative recovery and whether targeted interventions can improve clinical outcomes.

Ethics

Ethics Committee Approval: Ethical approval was obtained from the University of Health Sciences Türkiye, Koşuyolu Yüksek İhtisas Training and Research Hospital Ethics Committee (decision no: 2026/04/1386, date: 24.02.2026).

Informed Consent: The study was conducted in accordance with the Declaration of Helsinki and written informed consent was

obtained from all participants prior to participation in the study. All study data were anonymized and used solely for scientific purposes.

Footnotes

Authorship Contributions

Surgical and Medical Practices: H.Ç.K., Concept: H.Ç.K., B.B.K., Design: H.Ç.K., Data Collection or Processing: H.Ç.K., B.B.K., A.S.K., Analysis or Interpretation: B.B.K., O.T., B.Y., Literature Search: H.Ç.K., B.B.K., Writing: H.Ç.K., B.B.K.

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

Financial Disclosure: The authors declared that this study received no financial support.

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