

Evaluation of Preoperative and Postoperative Anxiety Levels of Patient Relatives in Patients Undergoing Anesthesia for Surgical Operation

Cerrahi Operasyon İçin Anestezi Uygulanacak Hastalarda, Hasta Yakınlarının Preoperatif ve Postoperatif Anksiyete Düzeylerinin Değerlendirilmesi

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ABSTRACT

Objective: Using the STAI anxiety scale, patient relatives; We aimed to evaluate preoperative, intraoperative and postoperative anxiety levels according to age, gender, familiarity levels, education, professions, anesthesia experience and type of surgery.

Methods: Preoperative, intraoperative and postoperative advice to the relatives of patients who will undergo surgery; The "STAI FORM TX-1" survey form, which is used to measure situational anxiety, was filled out according to the patient's relatives' age, gender, level of closeness with the patient, educational status, profession, anesthesia experience, type of surgery that the patient will undergo and their level of preoperative information.

Results: Each group is formed according to preoperative, intraoperative and postoperative patient age, gender, ASA, surgery type, surgery duration, anesthesia type, patient relative age, patient relative gender, past anesthesia experience, degree of closeness, frequency of meeting with the patient, education level and income level. When compared, there was a statistically significant difference in all groups except the group with patient age >74 and the group whose degree of closeness to the patient was the mother ($P < .05$). When all groups were evaluated within themselves, male gender was statistically significant for anxiety generation in terms of patient gender ($P < .05$).

Conclusion: It has been observed that there are multiple factors that can cause anxiety in patients' relatives. It has been observed that the intraoperative anxiety of patient relatives with high preoperative anxiety levels increases, and postoperatively, it decreases from preoperative levels.

Keywords: Anxiety, State-Trait Anxiety Inventory (STAI) scale, Patient relatives

Öz

Amaç: STAI anksiyete skalası kullanarak hasta yakınlarının; yaş, cinsiyet, yakınlık düzeyleri, eğitimi, meslekleri, anestezi deneyimleri, ameliyat türüne göre preoperatif, intraoperatif ve postoperatif anksiyete düzeylerini değerlendirmeyi amaçladık.

Yöntemler: Cerrahi operasyon olacak hastaların yakınlarına preoperatif, intraoperatif ve postoperatif; hasta yakınlarının yaşı, cinsiyeti, hasta ile olan yakınlık düzeyleri, eğitim durumları, meslekleri, anestezi deneyimleri, hastalarının olacağı ameliyat türü ve preoperatif bilgi edinme düzeylerine göre durumsal kaygıyı ölçmede kullanılan "STAI FORM TX-1" anket formu doldurtuldu.

Bulgular: Hasta yaşı, cinsiyeti, ASA, cerrahi tipi, cerrahi süresi, anestezi şekli, hasta yakını yaşı, hasta yakını cinsiyeti, geçmiş anestezi deneyimi, yakınlık derecesi, hasta ile görüşme sıklığı, eğitim durumu ve gelir düzeyine göre oluşturulan her bir grup preoperatif, intraoperatif ve postoperatif olarak karşılaştırıldığında hasta yaşı > 74 olan grup ve hasta yakınlık derecesi anne olan gruplar haricinde tüm gruplarda istatistiksel olarak

anlamli fark mevcuttu ($P < ,05$). Tüm gruplar kendi içinde değerlendirildiğinde hasta cinsiyeti açısından erkek cinsiyet anksiyete oluşturma için istatistiksel olarak anlamlı idi ($P < ,05$).

Sonuç: Hastaların yakınlarında anksiyeteye sebep olabilecek birden fazla faktörün olduğu görülmüştür. Preoperatif kaygı durumları yüksek olan hasta yakınlarının intraoperatif kaygılarının arttığı, postoperatif ise preoperatif düzeylerden aşağılara indiği görülmüştür.

Anahtar Kelimeler: Anksiyete, State-Trait Anxiety Inventory (STAI) skalası, Hasta yakını

INTRODUCTION

Preoperative evaluation is a crucial process for patients of all ages before undergoing surgery. This assessment identifies comorbidities prior to the operation, allowing for the establishment of optimal conditions for anesthesia during surgery and postoperative care. Additionally, it provides an opportunity to address abnormalities detected in laboratory tests of patients unaware of any underlying conditions. Preoperative evaluation offers insights into the potential interactions of the patient's current medications with anesthetics. Preoperative evaluation also guides the development of appropriate treatment strategies both before surgery and during the postoperative hospital stay. Furthermore, it serves to address preoperative concerns of patients and their families, thereby alleviating anxiety disorders to some extent.¹

Unresolved concerns that could lead to anxiety disorders may cause significant distress for patients' families. Such distress can result in unforeseen complications throughout the patient's hospital stay, from preoperative admission to discharge.² In some cases, heightened anxiety levels in patients and their families may even increase the patient's need for analgesia during hospitalization due to the underlying condition or the surgical procedure itself.³ Despite the similarities among anxiety, depression, apprehension, and fear, various surveys have been conducted to assess these emotional disorders in patients seeking hospital treatment.^{4,5} According to these surveys, anxiety-related issues are not limited to patients but also represent challenges for their families and healthcare providers, who must find ways to address or mitigate these problems.⁶

The anxiety levels of patients' families have been evaluated using the State-Trait Anxiety Inventory (STAI), developed by Spielberger. The STAI categorizes anxiety into two dimensions: state anxiety and trait anxiety.⁷ It comprises two separate scales, each consisting of 20 items. This inventory is self-administered and straightforward to apply. In our study, we utilized the state anxiety scale, which measures situational anxiety. The validity and reliability of this scale for use in Turkey were established by N. Öner in

1977. Anxiety levels for state anxiety (S-anxiety) are classified as follows: low anxiety <35 points, moderate anxiety 36–46 points, and high anxiety >47 points (Table 1).

This study aimed to evaluate the preoperative, intraoperative, and postoperative anxiety levels of patients' families whose relatives were undergoing surgery with anesthesia administration.

METHODS

Study Design

This study aimed to measure and compare the anxiety levels of patients' relatives in the preoperative, intraoperative, and postoperative periods. Measurements were taken during premedication in the anesthesia clinic in the preoperative period, while waiting in the surgical waiting area during the intraoperative period, and at the bedside in the postoperative period.

Study Population and Sample

Ethical approval for the study was obtained from the Atatürk University, Faculty of Medicine Ethics Committee on March 25, 2021 (Meeting No. 2, Decision No. 121). The study population included relatives (aged 18 years and older) of patients scheduled for elective or emergency surgical procedures under general or regional anesthesia in the Department of Anesthesiology and Reanimation between March 2021 and May 2021. The surgeries spanned various specialties, including Cardiovascular Surgery, Neurosurgery, ENT Surgery, General Surgery, Pediatric Surgery, Orthopedic Surgery, Urologic Surgery, Plastic and Reconstructive Surgery, Ophthalmic Surgery, and Obstetrics and Gynecology.

To ensure consistency, each questionnaire was completed by a single relative of each patient. If multiple relatives of the same patient completed questionnaires, the data were excluded. Relatives under 18 years of age or those who were illiterate were also excluded. All participants signed informed consent forms, which were documented. In the postoperative period, all patients were managed to achieve a Visual Analog Scale (VAS) pain score of ≤ 4 .

Table 1. Spielberger Anxiety State Scale: STAI FORM TX-1

	Not at all (1)	A little (2)	Very much (3)	Completely (4)
1 I'm feeling calm.				
2 I'm feeling secure.				
3 I'm feeling tense at the moment.				
4 I'm feeling regretful.				
5 I'm feeling peaceful.				
6 I'm not feeling cheerful.				
7 I feel worried for what's waiting for me.				
8 I'm feeling rested.				
9 At the moment, I'm anxious.				
10. I'm feeling comfortable.				
11 I'm feeling confident.				
12 At the moment, I'm feeling upset.				
13 I'm very angry.				
14 I'm feeling my nerves are very tense.				
15 I'm feeling relieved.				
16 At this moment, I feel content.				
17 At this moment, I'm nervous.				
18 I'm feeling baffled with excitement.				
19 I'm joyful.				
20 At the moment, I'm in a good mood.				

The translated version of the scale in Turkish that was adapted by N. Öner in 1977

The sample size was calculated based on a previous study by Taşdemir et al.⁸ using G-POWER software, with preoperative anxiety levels of 40.5 ± 12.5 and postoperative anxiety levels of 38.5 ± 12.0, a sample of 297 patient-relative pairs was determined to achieve 95% confidence and 80% power to detect a meaningful difference of 2 points.

A total of 312 patients were initially enrolled. However, 4 were excluded due to illiteracy, 2 were under 18 years of

age, and 2 others were excluded because their relationship to the patient was at a friendship level. Data from 304 patients were ultimately analyzed.

Data Collection Tools

Patient relatives were asked to complete questionnaires during three visits. The first questionnaire was administered in the preoperative period outside the examination room after premedication and consultation in the anesthesia clinic. The second was administered during the

intraoperative period, 10 minutes after the patient entered the operating room, in the waiting area. The third was completed in the postoperative period, 2 hours after the patient was transferred to their hospital bed from the operating room.

The questionnaires consisted of five sections:

1. Section 1: Demographic details of the patient, date of form completion, ASA score, clinical ward, diagnosis, type of surgery, duration of surgery, consent status, and planned anesthesia method.
2. Section 2: Demographic details of the patient's relative, including gender, relationship to the patient, frequency of interaction with the patient, education level, occupation, income status, and previous anesthesia experience.
3. Section 3: Preoperative STAI form.
4. Section 4: Intraoperative STAI form.
5. Section 5: Postoperative STAI form.

In the preoperative period, relatives completed sections 1 and 2 along with the preoperative STAI form. During surgery, they filled out only the intraoperative STAI form. In the postoperative period, the relatives completed the postoperative STAI form during bedside visits.

Statistical Analysis

Data were analyzed using SPSS version 20. Numerical data (IBM Corp., Armonk, NY, USA) were presented as mean \pm standard deviation, while categorical data were summarized as counts (n).

- For comparisons between two independent groups, the Independent Samples t-test was used if normality assumptions were met; otherwise, the Mann-Whitney U test was applied.
- For comparisons among more than two independent groups, ANOVA was used for normally distributed data, and the Kruskal-Wallis test for non-normally distributed data. Post-hoc analyses for ANOVA employed the Tukey test (for homogeneous variances) or Tamhane's T2 test (for non-homogeneous variances). Post-hoc tests for the Kruskal-Wallis test used the Kruskal-Wallis 1-way ANOVA (k samples) method.
- For dependent groups with repeated measures, Repeated Measures ANOVA was used for normally distributed data, and the Friedman test for non-normally distributed data. Post-hoc tests for Repeated Measures ANOVA used the Tukey or Tamhane's T2 tests based on variance homogeneity. Post-hoc analyses following the Friedman test utilized the Friedman 2-way ANOVA by ranks (k samples) method.

A p-value of $< .05$ was considered statistically significant.

RESULTS

The demographic data of 304 patients and their relatives, along with STAI form responses during the preoperative, intraoperative, and postoperative periods, were recorded and statistically compared.

Anxiety Scores Based on Patient Age:

- For patients aged 0–18 years, there was a statistically significant difference in anxiety scores between preoperative and postoperative, and intraoperative and postoperative periods in favor of the preoperative and intraoperative groups ($P < .05$). For patients aged 18–65 years, a statistically significant difference was observed across all groups ($P < .05$). For patients aged 65–74 years, a statistically significant difference was found between preoperative and intraoperative, and postoperative and intraoperative periods in favor of the intraoperative group ($P < .05$). For patients older than 74 years, no statistically significant difference was found among the groups ($P > .05$) (Table 2).

Anxiety Scores Based on Patient Gender

- For male patients, there was a statistically significant difference between preoperative and intraoperative, and postoperative and intraoperative periods in favor of the intraoperative group ($P < .05$). For female patients, a statistically significant difference was observed across all groups ($P < .05$) (Table 2).

Anxiety Scores Based on ASA Classification

- For ASA I patients, a statistically significant difference was observed across all groups ($P < .05$). For ASA II and III patients, a statistically significant difference was found between preoperative and intraoperative, and postoperative and intraoperative periods in favor of the intraoperative group ($P < .05$) (Table 2).

Anxiety Scores Based on Surgery Type

- For emergency surgeries, there was a statistically significant difference between preoperative and postoperative anxiety scores in favor of the preoperative group ($P < .05$). For elective surgeries, a statistically significant difference was observed across all groups ($P < .05$) (Table 3).

Anxiety Scores Based on Surgery Duration

- For surgeries lasting 0–30 minutes and 30–60 minutes, a statistically significant difference was observed between preoperative and postoperative anxiety scores in the preoperative group, and between intraoperative and

Table 2. Patient relative anxiety scores according to patient age, gender and ASA classification

Patients' age	n (number)	Preoperative Group	Intraoperative Group	Postoperative Group	P
0-18	22	44.77±8.80 ^b	48.64±11.94 ^a	37±9.48	<.001
18-65	215	39.26±10.27	43.59±10.94 ^a	36.86±10.02	<.001
65-74	46	38.46±8.68	47.5±10.73 ^a	37.41±9.77	<.001
>74	21	39±7.60	43.04±10.13 ^a	36.04±8.79	.239
Gender					
Male	132	39.47±8.85	46.48±10.10 ^a	38.4±9.56	<.001
Female	172	39.55±10.59	42.99±11.49 ^a	35.75±9.89	<.001
ASA					
I	143	40.35±10.04	45.08±11.04 ^a	36.72±9.79	<.001
II-III	161	38.78±9.66	44.01±11.03 ^a	37.06±9.88	<.001

Values are given as mean ± SD and n (number)

^aSignificant difference between intraoperative and other groups

^bSignificant difference between preoperative and postoperative groups

postoperative scores in the intraoperative group ($P < .05$). For surgeries lasting 60–90 minutes, 90–120 minutes, and over 120 minutes, a statistically significant difference was observed between preoperative and intraoperative, and postoperative and intraoperative periods in favor of the intraoperative group ($P < .05$) (Table 3).

Anxiety Scores Based on Anesthesia Type:

- For patients under general anesthesia, a statistically significant difference was observed across all groups ($P < .05$). For patients under regional anesthesia, a statistically significant difference was found between preoperative and intraoperative anxiety scores in favor of the intraoperative group ($P < .05$) (Table 3).

Anxiety Scores Based on Relative Age:

- For relatives aged 18–30 and 30–50 years, a statistically significant difference was observed across all groups ($P < .05$). For relatives older than 50 years, a statistically significant difference was observed between preoperative and intraoperative anxiety scores in favor of the intraoperative group ($P < .05$) (Table 4).

Anxiety Scores Based on Relative Gender:

- For male relatives, there was a statistically significant difference between preoperative and intraoperative, and postoperative and intraoperative periods in favor of the intraoperative group ($P < .05$). For female relatives, a statistically significant difference was found between

preoperative and postoperative scores in favor of the preoperative group, and between intraoperative and postoperative scores in favor of the intraoperative group ($P < .05$) (Table 4).

Anxiety Scores Based on Anesthesia Experience:

- Regardless of whether the relative had prior anesthesia experience, a statistically significant difference was observed across all groups ($P < .05$) (Table 4).

Anxiety Scores Based on Relationship to the Patient:

- For spouses and other relatives, a statistically significant difference was observed between preoperative and intraoperative, and postoperative and intraoperative periods in favor of the intraoperative group ($P < .05$). For fathers, a statistically significant difference was found between postoperative and intraoperative periods in favor of the intraoperative group ($P < .05$). For children, a statistically significant difference was observed across all groups ($P < .05$). For mothers, no statistically significant difference was found among the groups ($P > .05$) (Table 5).

Anxiety Scores Based on Frequency of Interaction with the Patient:

- For relatives who interacted with the patient daily, a statistically significant difference was observed across all groups ($P < .05$). For relatives who interacted weekly, a statistically significant difference was found between preoperative and intraoperative, and postoperative and

Table 3. Relative anxiety scores according to surgery type, surgical duration and anesthesia type

Surgery type	n (number)	Preoperative Group	Intraoperative Group	Postoperative Group	P
Urgent	13	32.15±6.34	33.08±8.92 ^a	29.92±4.87	<.001
Elective	291	39.85±9.86	45.02±10.85 ^a	37.21±9.87	<.001
Surgical Duration (minute)					
0-30	20	45.75±5.69 ^c	44.60±9.41 ^b	36.85±10.97	<.001
30-60	77	41.40±10.34	43.03±8.69 ^a	37.30±9.91	<.001
60-90	36	39.42±8.77	43.97±10.77 ^a	33.81±9.21	<.001
90-120	80	37.04±9.55	42.41±11.20 ^a	36.9±9.99	<.001
> 120	91	38.77±10.10	47.80±12.45 ^a	37.8±9.54	<.001
Anesthesia type					
General	272	39.31±9.91	44.42±11.13	36.68±9.74	<.001
Regional	32	41.28±9.38	45.25±10.28	38.75±10.42	.035

Table 4. Anxiety scores according to patient relatives' age, gender and anesthesia experience

Relatives' age	n (number)	Preoperative Group	Intraoperative Group	Postoperative Group	P
18-30	120	38.74±10.97	43.13±11.07 ^a	36.45±9.99	<.001
30-50	161	39.61±9.84	45.19±11.04 ^a	36.47±9.25	<.001
>50	23	42.91±6.11	46.96±10.26 ^b	42.30±11.51	<.001
Gender					
Male	207	38.72±9.81	44.9±10.9 ^a	37.20±9.69	<.001
Female	97	41.22±9.78	43.68±11.32 ^a	36.26±10.12	<.001
Anesthesia experience					
No	185	39.76±10.27	44.41±11.21 ^a	37.23±10.14	<.001
Yes	119	39.13±9.19	44.66±10.78 ^a	36.39±9.33	<.001

Values are given as mean ± SD and n (number)

^a Significant difference between intraoperative and other groups

^b Significant difference between intraoperative and postoperative groups

Table 5. Patient relative anxiety scores according to degree of closeness and frequency of occurrence

Degree of closeness	n (number)	Preoperative Group	Intraoperative Group	Postoperative Group	P
Spouse	62	37.92±10.01	43.94±10.87 ^a	36.13±9.69	<.001
Mother	11	47.18±10.48	45.27±9.21	36.82±8.35	.148
Father	18	44.33±9.59	47.06±12.59 ^b	37.28±9.25	<.001
Child	150	39.33±9.20	44.51±11.34 ^a	37.25±10.28	<.001
Other	63	38.81±10.46	44.22±10.47 ^a	36.75±9.46	<.001
Frequency of occurrence					
All days	239	39.41±10.04	43.46±10.95 ^a	36.84±10.27	<.001
Once a week	43	38.30±7.16	46.30±10.96 ^a	35.63±8.12	<.001
Once a month	22	43.09±11.86	52.41±8.51 ^a	40.05±7.09	<.001

Values are given as mean ± SD and n (number)

^a Significant difference between intraoperative and other groups

^b Significant difference between intraoperative and postoperative groups

Table 6. Anxiety scores according to the education level of the patient's relative and relative income

Education level	n (number)	Preoperative Group	Intraoperative Group	Postoperative Group	P
Elementary School	39	42.03±7.83 ^a	45.44±11.23 ^a	37.21±9.94	<.001
Middle School	43	42±9.58	49.42±9.29 ^b	40.63±8.79	<.001
High School	97	39.72±9.92	44.25±10.57 ^b	37.46±9.56	<.001
University	125	37.72±10.19	42.74±11.45 ^b	35.09±10	<.001
Relative income (Turkish Lira)					
0-5k	177	40.11±9.19	44.97±10.78 ^c	38.11±9.62	<.001
5k-10k	110	38.25±10.51	43.43±11.22 ^b	35.16±10.02	<.001
>10k	17	41.59±11.76	46.76±12.34 ^b	35.53±9.26	<.001

Values are given as mean ± SD and n (number)

^a Significant difference between pre-intraoperative and postoperative groups

^b Significant difference between intraoperative and other groups

^c Significant difference between intraoperative and postoperative groups

intraoperative periods in favor of the intraoperative group ($P < .05$). For relatives who interacted monthly, a statistically significant difference was found between postoperative and intraoperative periods in favor of the intraoperative group ($P < .05$) (Table 5).

Anxiety Scores Based on Education Level:

- For relatives with primary school education, a statistically significant difference was found between postoperative and intraoperative periods in favor of the intraoperative group ($P < .05$). For relatives with middle

school or university education, a statistically significant difference was observed between preoperative and intraoperative, and postoperative and intraoperative periods in favor of the intraoperative group ($P < .05$). For relatives with high school education, a statistically significant difference was observed across all groups ($P < .05$) (Table 6).

Anxiety Scores Based on Income Level:

- For relatives with low or middle income, a statistically significant difference was observed across all groups ($P < .05$). For relatives with high income, a statistically significant

difference was found between postoperative and intraoperative periods in favor of the intraoperative group ($P < .05$) (Table 6).

DISCUSSION

Preoperative evaluation is a mandatory procedure for patients undergoing surgery, aimed at mitigating potential anxiety disorders in patients and their relatives as much as possible.¹

Any thought that could induce distress during the patient's treatment may trigger anxiety in their relatives, potentially leading to undesirable complications throughout the hospitalization, from admission to discharge.²

In our study, we evaluated the anxiety levels experienced by relatives of patients undergoing anesthesia and surgery. Most studies in the literature focus on assessing anxiety levels in patients. However, studies investigating the anxiety levels of patient relatives are limited.

When examining the patient's age, our study found that relatives were most concerned about patients under 18 years old in preoperative, intraoperative, and postoperative periods. Anxiety scores for patients younger than 74 years increased intraoperatively and were lowest postoperatively. For patients older than 74 years, relatives exhibited nearly similar anxiety scores in all three periods. Lim et al.⁹ found anxiety scores around 60 for relatives of patients older than 70 years scheduled for surgery, while our study reported scores around 43 for the >74 age group. In contrast to our findings, Kaytancı¹⁰ observed higher anxiety levels among relatives of elderly patients. Çağırır¹¹ did not find any significant difference in anxiety scores among relatives of pediatric patients, but their study focused on patients under 12 years old. In our study, anxiety scores decreased as patient age increased.

Regarding patient gender, relatives expressed higher anxiety levels for male patients. For both genders, intraoperative anxiety scores were higher than preoperative and postoperative scores. Çağırır¹¹ also reported similar anxiety levels among patient relatives for both genders.

Examining ASA classification, there was no significant difference in anxiety scores between ASA I and ASA II-III groups during preoperative, intraoperative, or postoperative periods. However, intraoperative anxiety scores were significantly higher in both groups. Contrary to our findings, Mingir¹² observed that anxiety increased as ASA classification increased.

In terms of emergency versus elective surgery, our study revealed that relatives had higher anxiety scores for elective cases during all periods compared to emergency cases. This might be due to relatives of emergency cases already experiencing high anxiety levels upon hospital admission, or the longer waiting periods for elective cases. Latif et al.¹³, in contrast, found higher anxiety levels in emergency cases, though their study focused on patients' anxiety rather than their relatives.

For surgery duration, our study observed that shorter surgeries were associated with higher anxiety levels among relatives. Intraoperative anxiety scores were consistently higher across all surgery durations. No similar studies on surgical duration and relative anxiety were found in the literature.¹⁴

Regarding the type of anesthesia, relatives of patients undergoing regional anesthesia exhibited slightly higher, though not statistically significant, anxiety scores compared to those undergoing general anesthesia. Similarly, Jansen et al.¹⁵ reported higher anxiety scores for local anesthesia.

When analyzing relatives' age groups, intraoperative anxiety scores were higher than preoperative and postoperative scores across all age groups. Anxiety levels increased as relatives' age increased. No studies in the literature have directly assessed the correlation between relatives' age and anxiety regarding their patients' surgery. However, Türedi¹⁶ found that anxiety levels increased with relatives' age in a study involving ICU patients, consistent with our findings.

In terms of gender, male relatives exhibited higher intraoperative and postoperative anxiety scores, while female relatives had higher preoperative scores. No literature was found regarding the impact of gender on relatives' anxiety scores. However, Taşdemir et al.⁸ found that female patients exhibited higher preoperative and postoperative anxiety scores, aligning with our findings preoperatively but differing postoperatively.

Relatives with previous anesthesia experience exhibited lower preoperative anxiety scores compared to those without experience, though intraoperative scores remained high for both groups. Xavier et al.¹⁷ found higher anxiety scores in parents without prior anesthesia or surgical experience, differing from our findings.

Regarding the relationship to the patient, mothers had the highest preoperative anxiety scores, while fathers had the highest intraoperative scores. Across all relationships,

intraoperative anxiety scores were higher than preoperative and postoperative scores. Türedi¹⁶ similarly observed high anxiety levels among ICU patients' parents.

The frequency of patient-relative interaction also influenced anxiety levels; less frequent interaction correlated with higher anxiety scores. Across all interaction frequencies, intraoperative anxiety scores were highest. No related studies were found in the literature.

Concerning education level, anxiety scores decreased as the education level of relatives increased. Intraoperative anxiety scores were higher than preoperative and postoperative scores across all educational levels. In contrast, Çağiran¹¹ reported that higher education levels were associated with increased anxiety scores among mothers of pediatric patients.

Finally, income level influenced anxiety differently across periods. Preoperative and intraoperative anxiety scores increased with higher income, whereas postoperative anxiety scores decreased. Similar findings were reported by Çağiran et al.¹¹ and Alacacioğlu et al.¹⁸, who found that higher income levels correlated with increased preoperative anxiety but decreased postoperative anxiety.

CONCLUSION

Although the necessity of surgery is a well-known cause of anxiety, our study highlighted various factors influencing the severity, progression, and development of anxiety among patient relatives. These factors included the patient's age, gender, surgery type and duration, anesthesia method, ASA classification, and the relatives' demographics, socio-cultural background, and relationship to the patient.

Despite the multifactorial nature of anxiety, our findings, consistent with previous studies, indicate a decreasing trend in anxiety levels among patient relatives as the surgical process progresses. Given the complex etiology of anxiety, further research is needed to gain deeper insights and improve patient-relative support during the perioperative period.

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Hasta Onamı: Çalışma hakkında bilgi verildikten sonra tüm katılımcılardan yazılı bilgilendirilmiş onam alındı.

Hakem Değerlendirmesi: Dış bağımsız.

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