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ORIGINAL ARTICLE

Prevalence and factors associated with surgery anxiety in hospitalized patients: a point-prevalence study

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Abstract

Background Preoperative anxiety is a challenging problem in the preoperative care of patients. Identifying risk factors helps nurses provide psychological support during the pre-operative visit so that stress can be reduced.

Aims This study aimed to determine the prevalence of surgical anxiety and related factors in hospitalized surgical patients.

Methods This research was designed as a point-prevalence study. The study was completed with 223 patients hospitalized in the surgical clinics of a tertiary hospital in Turkey. Surgical anxiety questionnaire (SAQ) and State-trait anxiety inventory (STAI) were used for the assessment of anxiety.

Results Preoperative anxiety prevalence was 69.5% according to the SAQ and 49.3% according to STAI. Women, participants with no primary school education, those who were unemployed and had low income, those with no previous surgery, those living in fear of surgery, the participants who underwent major surgery and general anesthesia, and those who did not have knowledge about the surgical procedure and anesthesia had higher anxiety according to the two scales. A highly significant and positive correlation was found between total STAI and total SAQ.

Conclusion The importance of surgical anxiety for the health system, which affects two out of every three hospitalized patients, should not be underestimated. Therefore, national and global plans should be made to prevent and manage surgical anxiety.

Keywords Anxiety · Preoperative · Prevalence · Surgery

Introduction

Anxiety is defined as a state of tension, worry, anxiety, restlessness, uneasiness, a common sense of fear, or unexplained internal discomfort in response to a perceived threat [1]. Since surgical intervention is a traumatic treatment method that causes major life changes and is associated with bleeding, pain, or sometimes death, it causes anxiety in individuals [2]. A majority (60–70%) of patients develop high levels of anxiety before surgery [3, 4]. In the face of surgery, patients may experience varying levels of anxiety, from a mild sense of uneasiness to an extreme degree of panic [5]. Advanced and long-term anxiety causes an increase in sympathetic, parasympathetic, and hormonal stimuli, creating various psychological and physiological problems in the individual and delaying recovery [5, 6]. In the literature, surgical anxiety has been associated with increased postoperative pain, increased use of anesthetics and analgesics, delayed wound healing, increased risk of complications, prolonged hospital stay, and decreased patient satisfaction [3, 6–8].

The perioperative period is considered a stressful event that triggers specific emotional, cognitive, and physiological responses in patients awaiting surgery [9]. Preoperative anxiety gradually increases starting with the planning of the surgery and reaches its peak on entering the operating room [10]. Since anxiety is an emotional response influenced by social and individual factors, the incidence and degree of preoperative anxiety may vary in different patient populations [9]. Preoperative anxiety is a challenging problem in the preoperative care of patients. Identifying risk factors helps healthcare professionals provide psychological support during the pre-operative visit so that stress can be reduced. Therefore, it is important to determine the prevalence of surgical anxiety and its affecting factors in patient populations. Although there are studies conducted to determine surgical anxiety [11–13], the extent of preoperative anxiety

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in surgical patients in the Turkish population is not yet fully known. Therefore, the aim of this study was to evaluate the prevalence of preoperative anxiety and associated factors among surgical patients in a tertiary hospital.

Our research questions were as follows:

1. What is the prevalence of surgical anxiety in patients hospitalized in surgical clinics?
2. What are the factors associated with surgical anxiety of hospitalized patients in surgical clinics?

Material and methods

Study design and participants

This research was designed as a point-prevalence study. It was conducted in a 1050-bed tertiary hospital in a city in Turkey. On a typical day, all hospitalized patients aged 18 years and older were invited to participate in the study based on inpatient prediction models.

Inclusion criteria were being aged 18 years and over, being in the preoperative period, and agreeing to participate in the study. Exclusion criteria were (a) neuropsychiatric problems, (b) cognitive dysfunction and disability, (c) having emergency or critical conditions in the emergency department and intensive care units, (d) having emergency surgery, and (e) being in the postoperative period.

Data collection

On the day of data collection, a list was made of all inpatients aged 18 and over in surgical clinics. At initial contact, a verbal description of the study was provided, and written consent was obtained. Then, the anxiety scales were applied to the patients in the preoperative period. The data were obtained from electronic health records and interviews conducted by researchers in the patient rooms. Data were collected between 24 and 26 January 2023, since the patient interviews lasted approximately 15 – 20 min. The study invited 223 patients (Fig. 1). One surgery clinic nurse and one surgical specialist nurse visited the wards and performed the patient's surgery anxiety assessment. The team of two worked together to ensure the objectivity of the study. The surgical clinic nurse was trained by the researcher in data collection. Before starting data collection, the study team reviewed the data collection forms. Thus, by creating a common language, an attempt was made to ensure the reliability of the study.

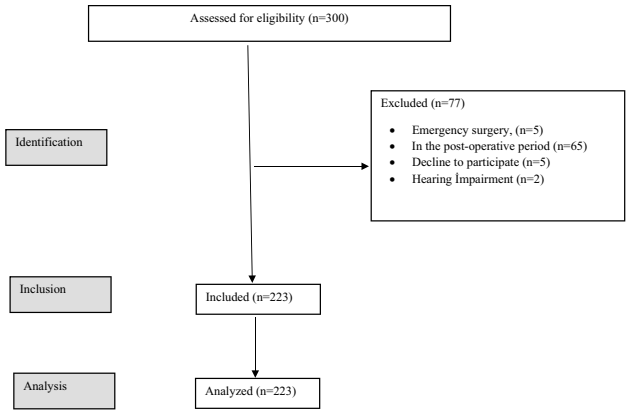

Fig. 1 Flow chart

Instruments

A questionnaire form and two different anxiety scales were used to assess surgical anxiety. The State-trait anxiety inventory (STAI), which provides a multidimensional and general evaluation, and the Surgical anxiety questionnaire (SAQ), which is surgery-specific, practical, and straightforward, were used to evaluate surgical anxiety.

Questionnaire form

The form consists of 13 questions that include age, gender, marital, educational, working, and income status of the individual, previous surgery, knowledge about the surgical and anesthesia procedures, the extent of the operation, surgery clinic type, type of anesthesia, and the state of fear associated with surgery. We classified anesthesia types into local and general. Types of anesthesia (regional and local) other than general anesthesia were classified as local anesthesia. We classified surgery types into minor or major surgery based on the European Surgical Association Delphi Consensus definition [14] and literature [15].

Surgical anxiety questionnaire (SAQ)

The SAQ, developed by Burton et al. [16] to evaluate the preoperative anxiety levels of patients, consists of a total of 17 items and four subdimensions. Turkish validity and reliability studies were performed by Topçu et al. [1]. The scale's subdimensions are concerns about health (6 items: Q7, Q9, Q10, Q11, Q12, Q13), concerns about recovery (4 items: Q14, Q15, Q16, Q17), concerns about surgical procedure (4 items: Q1, Q2, Q4, Q8), and concerns about

invasive procedures (3 items: Q3, Q5, Q6). The scale items are scored as 0 = "I am not anxious at all," 1 = "I am anxious a little," 2 = "I am partially anxious," 3 = "I am anxious a lot," and 4 = "I am extremely anxious," and high scores indicate high levels of anxiety. A minimum of 0 and a maximum of 68 points can be obtained from the scale. There is no cut-off point for the scale, and as the total score increases, it is interpreted as an increase in anxiety. The total Cronbach's alpha values of the scales were determined to be 0.91 [16] and 0.89 [1]. In this study, a Cronbach's alpha value of 0.90 was calculated.

State-trait anxiety ınventory (STAI)

The STAI, which was developed by Spielberger [17], was used in this study. Turkish validity and reliability study were performed by Oner and Le Compte [18]. The lowest score that can be obtained from the scale is 20, and the highest score is 80. A higher score indicates a high level of anxiety, and a small score indicates a low level of anxiety. Scale scores of 20 to 37, 38 to 44, and 45 to 80 were evaluated as low, moderate, and high anxiety levels, respectively [18, 19]. The Cronbach's alpha value for state anxiety is between 0.94 and 0.96 [18]. In this study, the Cronbach's alpha value was 0.958 for state anxiety.

Ethical considerations

Ethical approval was obtained from the institutional review board at the tertiary hospital (no.: 2023–01/02) with permission from the hospital management. The principles of the Declaration of Helsinki were applied throughout the study, and informed consent was obtained from the participants.

Statistical analysis

Analyses were performed using SPSS 23.00 software (IBM SPSS Statistics Standard Concurrent User ver. 23). Descriptive statistical analyses (mean, standard deviation, frequency, and percentage) were used to evaluate the data. The normality of the data was evaluated with the Kolmogorov–Smirnov (K-S) test, and the values of skewness and kurtosis were checked. Because the data met the parametric conditions, they were analyzed with the independent sample *t*-test for two independent groups and the *F*-test (ANOVA) for more than two groups. Correlation analysis was performed to examine the relationship between scales, and $p < 0.05$ was considered statistically significant.

Results

It is seen in Table 1 that the mean age of the patients was 56.17 ± 16.78, 54.3% were male, 79.8% were married, 55.2% were primary/secondary school graduates, 80.7% were unemployed/retired, and 83.9% had income equal to expenditure. Over a majority (78%) of patients were scheduled for major surgery, 55.2% were informed about the surgical procedure, 60.5% were informed about the anesthesia, 80.71% received general anesthesia, 21.1% were in the neurosurgery and general surgery clinics, 75.8% had previous surgery, and 75.3% had fear of individuals about surgery. According to both the STAI scale and SAQ, there was a significant difference between anxiety and age, gender, education level, working and income status, type of anesthesia, previous surgery, fear of individuals about surgery, surgery clinic type, and information about the surgical and anesthesia procedure ($p < 0.05$). A significant difference was found between the four subdimensions of the SAQ scale and educational status, the extent of the operation, surgery clinic type, and fear of individuals about surgery ($p < 0.05$).

In Table 2, the SAQ total score average was 40.66 ± 11.26; the STAI total score was 48.16 ± 16.31, which shows that 49.3% of the patients according to STAI and 69.5% according to SAQ experience anxiety. According to SAQ, it was determined that 25.1% of the patients had little anxiety, 5.8% had partial anxiety, 31.4% had a lot of anxiety, and 7.2% had extreme anxiety.

Table 3 shows the correlation between STAI and SAQ and SAQ subdimension scores. When the table was examined, a highly significant positive correlation was found between total STAI and total SAQ ($r = 0.769$; $p = 0.001$) total STAI and SAQ subdimensions ($r = 0.727$, $r = 0.784$, $r = 0.737$, $r = 0.741$; $p = 0.001$).

Discussion

To our knowledge, this article is the first national-level point-prevalence study to estimate the prevalence of surgery anxiety and influencing factors in hospitalized persons in Turkey. In addition, this study is the first to evaluate the prevalence of surgical anxiety in patients in all surgical clinics and the factors affecting them simultaneously. In this study, the prevalence of surgery anxiety in hospitalized patients was 49.3% preoperatively according to the STAI and 69.5% according to the SAQ, 25.1% of the participants had little anxiety in SAQ, 5.8% had partial anxiety, 31.4% had a lot of anxiety, and 7.2% had extreme anxiety. In Turkey, preoperative anxiety prevalence was 23 to 44% [7, 11–13]. In our study, the prevalence of surgery anxiety was

Table 1 Comparison of the demographic data of the patients with the total mean scores of surgical anxiety scales ($n=223$)

Characteristics				Health	Recovery	Surgical procedure	Invasive procedures	SAQ	STAI
		n	%	$X \pm SD$	$X \pm SD$	$X \pm SD$	$X \pm SD$	$X \pm SD$	$X \pm SD$
Mean age (years/$X \pm SD$)	56.17 ± 16.78								
Age (year)	18–64	153	68.6	15.47 ± 4.49	6.90 ± 3.33	10.47 ± 3.82	6.15 ± 2.60	40.20 ± 11.19	47.28 ± 15.72
	65 and over	70	31.4	15.22 ± 4.76	8.17 ± 3.15	10.81 ± 3.20	7.15 ± 2.74	42.67 ± 11.41	49.51 ± 13.75
t/P				0.358/.72	5.213/.04*	0.684/.495	6.06/.04*	7.89/.037*	9.71/.049*
Gender	Female	102	45.7	15.75 ± 4.46	8.14 ± 3.16	11.82 ± 3.34	6.86 ± 2.65	41.42 ± 11.02	49.28 ± 15.72
	Male	121	54.3	15.09 ± 4.64	8.03 ± 3.39	9.38 ± 3.87	6.38 ± 2.68	37.68 ± 11.80	38.51 ± 13.75
t/ P				1.085/.28	0.259/.79	8.906/.036*	1.324/.187	8.00/.047*	8.68/.001**
Marital status	Married	178	79.8	15.76 ± 4.32	8.21 ± 3.33	10.85 ± 3.65	6.58 ± 2.71	41.58 ± 10.60	43.64 ± 15.70
	Single	45	20.2	14.93 ± 5.24	7.57 ± 3.07	9.51 ± 3.42	6.66 ± 2.50	39.89 ± 11.77	42.01 ± 15.63
t/ P				1.427/.22	1.217/.22	1.316/.23	0.180/.857	1.13/.259	0.99/.074
Educational status	No primary school	39	17.5	16.02 ± 4.49	8.57 ± 3.35	11.89 ± 2.85	7.33 ± 2.82	43.66 ± 10.48	49.27 ± 17.10
	Primary/ secondary school	123	55.2	15.66 ± 4.80	7.76 ± 2.80	10.39 ± 3.58	6.60 ± 2.62	41.60 ± 11.03	43.02 ± 14.12
	High school	41	18.3	11.80 ± 4.07	5.5 ± 1.53	8.75 ± 4.57	5.4 ± 2.58	31.45 ± 9.75	40.03 ± 13.15
	University	20	9.0	12.39 ± 4.56	6.08 ± 3.28	7.58 ± 3.64	6.60 ± 2.67	40.06 ± 11.26	41.12 ± 13.50
F/P				5.35/.001**	5.48/.001**	3.68/.013*	2.39/.04*	5.4/.001**	5.68/.013*
Working status	Yes	43	19.3	13.88 ± 4.53	7.74 ± 3.63	9.93 ± 3.65	5.14 ± 2.52	37.30 ± 11.14	40.03 ± 13.80
	No	180	80.7	15.75 ± 4.51	8.16 ± 3.20	10.73 ± 3.63	6.81 ± 2.67	41.47 ± 11.17	43.02 ± 16.50
t/P				4.43/.02*	0.70/.486	1.30/.196	6.46/.02*	7.24/.03*	6.46/.02*
Income status	Less	31	13.9	14.64 ± 5.05	9.29 ± 3.67	11.00 ± 4.06	6.61 ± 2.37	43.54 ± 12.74	48.27 ± 17.10
	Equals	187	83.9	15.59 ± 4.51	7.94 ± 3.20	10.52 ± 3.56	6.59 ± 2.70	40.66 ± 11.02	42.02 ± 14.12
	More	5	2.2	12.40 ± 1.51	6.00 ± 1.87	10.20 ± 4.38	6.80 ± 3.83	35.40 ± 11.50	40.02 ± 15.12
F/P				1.68/.187	5.34/.037*	0.25/.776	0.02/.986	7.74/.045*	8.46/.017*
The extent of the operation	Major surgery	174	78.0	16.07 ± 4.55	8.42 ± 3.14	10.96 ± 3.31	6.80 ± 2.71	42.27 ± 10.72	46.88 ± 15.76
	Minor surgery	49	22.0	12.97 ± 3.76	6.87 ± 3.52	9.22 ± 4.39	5.89 ± 2.39	34.97 ± 11.40	40.57 ± 14.12
t/P				4.85/.001**	4.77/.007**	4.57/.012*	4.27/.026*	8.05/.001**	6.427/.001**
Type of anesthesia	General	180	80.71	15.83 ± 3.51	10.91 ± 3.34	11.83 ± 2.12	7.25 ± 2.05	45.83 ± 7.58	46.14 ± 15.68
	Local	43	19.29	15.36 ± 4.62	7.92 ± 3.21	10.51 ± 3.69	6.56 ± 2.70	40.37 ± 11.37	39.51 ± 12.70
t/P				0.43/.670	6.02/.010*	1.99/.06	1.09/.292	4.64/.030*	5.64/.001**
Previous surgery	Yes	169	75.8	13.55 ± 4.29	8.03 ± 3.23	10.54 ± 3.69	6.14 ± 2.69	38.64 ± 10.75	43.94 ± 16.14
	No	54	24.2	13.98 ± 4.50	8.24 ± 3.45	10.70 ± 3.48	6.75 ± 2.55	41.31 ± 11.37	44.71 ± 13.70
t/P				6.57/.01*	0.38/.701	0.288/.774	1.489/.140	8.563/.03*	5.163/.04*
Fear of individuals about surgery	Yes	168	75.3	13.56 ± 4.34	5.94 ± 2.55	6.78 ± 3.16	4.43 ± 2.05	43.92 ± 10.06	49.26 ± 14.45
	No	55	24.7	15.62 ± 5.09	8.05 ± 3.37	11.82 ± 2.83	7.31 ± 2.46	30.72 ± 8.63	31.78 ± 10.30
t/P				3.57/.001**	5.98/.001**	10.51/.001**	7.82/.001**	9.43/.001**	8.331/.001**
Surgery clinic type	General surgery	47	21.1	14.78 ± 3.93	7.95 ± 3.10	9.08 ± 3.22	6.68 ± 2.60	38.51 ± 10.11	35.78 ± 13.93
	Neurosurgery	41	18.4	16.56 ± 4.38	8.90 ± 2.94	11.85 ± 2.45	5.87 ± 1.91	43.19 ± 8.40	44.56 ± 14.38
	Orthopedics	47	21.1	15.29 ± 4.19	8.25 ± 2.97	10.68 ± 3.20	7.31 ± 2.67	41.55 ± 9.67	43.29 ± 14.19
	Plastic	6	2.7	22.16 ± 2.04	9.33 ± 1.21	16.33 ± 1.21	10.00 ± 2.00	46.66 ± 12.35	49.16 ± 5.44
	Urology	15	6.7	12.93 ± 4.65	5.60 ± 1.84	8.46 ± 3.60	5.46 ± 3.18	32.46 ± 11.35	32.93 ± 12.65
	Cardiovascular	16	7.2	17.12 ± 4.60	10.62 ± 3.99	12.50 ± 2.87	8.37 ± 1.99	48.62 ± 11.45	47.12 ± 14.20

Table 1 (continued)

	Chest	12	5.4	14.50 ± 3.60	9.33 ± 2.80	12.50 ± 2.74	6.50 ± 2.46	42.83 ± 8.36	44.50 ± 13.60
	ENT	27	12.1	12.40 ± 3.53	5.44 ± 2.51	8.40 ± 4.63	5.18 ± 2.48	31.44 ± 10.51	32.40 ± 13.53
	Oncological surgery	12	5.4	19.16 ± 5.44	8.91 ± 4.29	11.91 ± 3.11	6.66 ± 3.17	57.83 ± 5.15	51.16 ± 16.04
F/P				6.52/.001**	6.18/.000**	8.19/.000**	6.75/.000**	9.007/.001**	6.523/.001**
Information about the surgical procedure	Yes	123	55.2	14.96 ± 5.13	8.00 ± 3.49	9.93 ± 3.97	6.10 ± 2.52	38.99 ± 12.19	42.98 ± 15.57
	No	100	44.8	15.74 ± 4.03	8.15 ± 3.11	11.11 ± 3.26	7.01 ± 2.72	42.03 ± 10.28	46.06 ± 15.17
t/P				1.28/.201	0.34/.728	6.442/.015*	6.599/.010*	7.020/.04*	7.599/.020*
Information about the anesthesia	Yes	135	60.5	15.24 ± 4.20	8.05 ± 3.37	9.89 ± 3.98	6.19 ± 2.64	39.77 ± 12.12	42.98 ± 15.57
	No	88	39.5	15.62 ± 5.09	8.10 ± 3.24	11.02 ± 3.33	6.87 ± 2.66	43.25 ± 10.66	45.06 ± 15.17
t/P				0.61/.544	0.11/.918	8.29/.02*	7.87/.04*	8.025/.04*	8.379/.030*

SAQ Surgical anxiety questionnaire, *STAI* State-trait anxiety inventory

** $p < .01$

higher than in other studies. This may be due to hospitalization, social differences, or social changes experienced by the patient during the pandemic. A meta-analysis evaluated 14,652 surgical patients in 17 countries and found that the universal preoperative anxiety prevalence was 48% [20]. Studies conducted in Europe have shown that the prevalence of preoperative anxiety among patients undergoing surgery varies from 27 to 80% [9]. Hellstadius et al. reported that 34% of participants had pre-surgical anxiety, 15% of them had mild anxiety, 14% had moderate anxiety, and 5% had severe anxiety [21]. In a study conducted in a tertiary hospital in Nigeria, it was reported that 51% and 90% of surgical patients had significant preoperative anxiety, respectively [22]. The results of our study, similar to the literature, reveal the importance of surgery anxiety in hospitalized patients. Healthcare professionals should not ignore surgery anxiety, which affects approximately two in three patients.

Many validated and reliable tools based on different conceptual approaches have been developed to enable anxiety identification [1]. Although anxiety has wide-ranging effects, the wide variety of instruments and the absence of a gold standard cause problems specific to surgery anxiety identification and management [9]. In our study, the STAI, which offers a multidimensional evaluation of state anxiety, and the SAQ scale, which is easy to use and practical for admitted patients, were used to determine surgery anxiety. In the study, 155 patients were found to have surgery anxiety according to evaluation with the SAQ, and 110 patients

Table 2 The total score averages of the STAI, SAQ, and SAQ subdimensions

Scales		$X \pm SD$	Min	Max
SAQ total score		40.66 ± 11.26	20	68
SAQ subdimensions	Concern about health	15.39 ± 4.56	6	24
	Concern about recovery	8.08 ± 3.28	4	16
	Concern about surgical procedure	10.48 ± 3.64	4	16
	Concern about invasive procedures	6.60 ± 2.67	3	12
STAI total score		48.16 ± 16.31	20	80
		n	%	
SAQ	I am not anxious at all	68	30.5	
	I am anxious a little	56	25.1	
	I am partially anxious	13	5.8	
	I am a lot anxious	70	31.4	
	I am extremely anxious	16	7.2	
STAI		110	49.3	

SD standard deviation, *SAQ* Surgical anxiety questionnaire, *STAI* State-trait anxiety inventory

Table 3 Correlation scores between STAI and SAQ and SAQ subdimensions

		SAQ	Health	Recovery	Surgical procedure	Invasive procedures	STAI
SAQ	*r*	1	0.774	0.777	0.726	0.777	0.769
	p		.001**	.001**	.001**	.001**	.001**
Health	*r*	0.774	1	0.799	0.710	0.756	0.727
	p	.001**		.001**	.001**	.001**	.001**
Recovery	*r*	0.777	0.799	1	0.709	0.767	0.784
	p	.001**	.001**		.001**	.001**	.001**
Surgical procedure	*r*	0.726	0.710	0.709	1	0.736	0.737
	p	.001**	.001**	.001**		.001**	.001**
Invasive procedures	*r*	0.777	0.756	0.767	0.736	1	0.741
	p	.001**	.001**	.001**	.001**		.001**
STAI	*r*	0.769	0.727	0.784	0.737	0.741	1
	p	.001**	.001**	.001**	.001**	.001**	

SAQ Surgical anxiety questionnaire, *STAI* State-trait anxiety inventory

** $p < .01$

according to the STAI scale. When comparing the ease of application between STAI and SAQ in the hospital setting, we found that SAQ was easiest and required only 5 to 10 min. Nevertheless, we cannot claim that it was sufficient for the accurate classification of surgery anxiety. That said, the SAQ scale is a valuable screening tool because it is a specific scale for assessing surgical anxiety. STAI can be used in cases where the level of state anxiety also affects surgical anxiety and a comprehensive evaluation is required.

Anxiety is a universal normal response to invasive and life-threatening procedures such as surgery and anesthesia [23, 24]. However, it is very important to identify and manage situations that cause surgical anxiety. There are many physical, psychological, and social factors associated with surgery anxiety. In our study, female sex, age, education level, working status, income status, type of surgery and anesthesia, the extent of the operation, anesthesia and surgery with lack of information, and fear of individuals about surgery were associated with a higher risk of surgery anxiety.

Sex has been reported in many studies to be an influential factor and a predictor that had a positive significant correlation with preoperative anxiety, with female sex being associated with higher levels of anxiety [3, 13, 25–27], and our study confirms this. According to these findings, it can be said that females are frailer than males in terms of surgical anxiety. The reason for this may be the cultural structure. As a matter of fact, it is culturally seen as a weakness for men to report their feelings of pain and fear, and therefore male patients can tend to hide their true feelings. In addition, females more easily express their anxiety than men and separation from the family affects women more.

Our study revealed that being 65 and over is a factor that affects surgery anxiety. Individuals aged 65 and over had a significantly higher level of anxiety about recovery and invasive procedures. This may be due to the comorbid diseases that increase with age, the decrease in the resistance to the procedures, and the decrease in the healing capacity of these individuals. There are different results in the literature on the relationship between age and surgical anxiety. While some of the studies argue that there is a positive relationship between increasing age and anxiety [28], there are studies that indicate a negative relationship [29]. In addition, a study reported that age is not a risk factor for preoperative anxiety [30].

In this study, patients with no primary education had significantly higher anxiety levels. In addition, it was determined that the anxiety levels of these patients related to health, recovery, surgery, and invasive procedures were significantly higher. It has been reported in many studies that low education level is a factor contributing to surgical anxiety [3, 13, 31]. This finding can be interpreted as the fact that individuals with low education levels have limited awareness of anesthesia and surgery, limited access to health information, and limited capacity to interpret the information they obtain.

In this study, it was determined that surgery and anesthesia type were other factors affecting surgical anxiety. In the study, participants receiving general anesthesia had higher preoperative anxiety levels, and the difference between the groups was statistically significant ($p < 0.05$). Studies have reported that patients with spinal/local anesthesia had a significantly lower incidence and severity of preoperative anxiety than those under general anesthesia [10, 11, 13].

Maheshwari et al. reported that the prevalence of preoperative anxiety was significantly higher in patients who received general anesthesia (97.18%) compared with those who received regional anesthesia (51.81%) for elective cesarean section [32]. In this study, the preoperative

anxiety level of the participants undergoing major surgery was higher than those undergoing minor surgery. In addition, it was determined that the anxiety levels of these patients related to health, recovery, surgery, and invasive procedure were also significantly higher. In a study evaluating patients undergoing major general surgery, it was determined that the majority of patients experienced high to very high levels of anxiety preoperatively [25]. Similarly, other studies have emphasized that major surgery is a factor that increases anxiety [3, 13, 24]. Major surgical interventions are mostly performed under general anesthesia. Therefore, this finding can be interpreted as patients are more concerned about the size of the surgery, loss of control due to general anesthesia, its effects on vital organs, death, non-recovery after surgery, and returning to daily life.

In this study, it was determined that the anxiety level of unemployed patients and patients with less income status was significantly higher than the others. Another study confirmed this result [3]. This result may be due to the fact that the patients could not afford to pay for the treatment costs.

Especially large and complex surgical interventions are an important factor that increases surgical anxiety in patients. In this study, the anxiety level was evaluated according to the surgical clinics with five clinical conditions with the highest anxiety level, oncological surgery, plastic, cardiovascular, neurosurgery, and chest surgery, respectively. It can be said that patients experience more anxiety in surgical procedures that are performed on cancer-related surgical procedures or in vital organs such as the heart, brain, and lungs, and in surgical procedures that affect the aesthetic appearance. In addition, it was determined that the anxiety levels of these patients related to health, recovery, surgery, and invasive procedure were also significantly higher. The risks of these surgeries cause patients to feel insecure. In a qualitative study, it was determined that patients experience intense anxiety due to the possibility of being diagnosed with cancer [33]. In a study, it was determined that more than 80% of patients undergoing heart surgery experienced moderate to high levels of anxiety [31]. Determining the risky group in terms of anxiety before surgery may provide an advantage for process management. Indeed, a study from Korea found that the STAI score was useful for predicting hemodynamic responses during anesthesia induction in non-cardiac surgical patients [34]. Moreover, patient-reported preoperative anxiety independently predicted the risk of mortality and major morbidity in patients aged > 70 years undergoing cardiac surgery [35]. A systematic review and meta-analysis, including 16 studies and 236.595 patients undergoing cardiac surgery, revealed that perioperative anxiety is associated with increased postoperative mortality [36]. It is expected from nurses to identify stressors that may cause anxiety throughout the surgical process, to know and diagnose the anxiety levels of individuals against stressors, to plan appropriate nursing interventions, to implement these planned interventions, and to evaluate and interpret the results of [22].

It was determined that the anxiety level of the patients who had no previous surgery experience was significantly higher, and the mean of the SAQ scale health-related subdimension anxiety was significantly higher. Studies have stated that surgical experience is a factor that reduces preoperative anxiety [3, 20].

In this study, it was determined that lack of information about surgery and anesthesia was a factor that increased the level of anxiety in patients. In addition, it was determined that the patients who did not receive information about the surgery had a significantly higher level of anxiety about surgery and the invasive procedure. Other studies have reported that those who do not have knowledge about the surgical procedure have higher anxiety levels [3, 13, 16]. In a study, it was emphasized that there is an inversely proportional relationship between the information received about the surgery and their anxiety levels; therefore, all the information they need should be provided with a personalized intervention [31]. Indeed, in a study, it was reported that good communication and comprehensive preoperative counseling can alleviate mental stress and reduce moderate to severe anxiety in patients [37]. The anesthesiologist's visit, the surgeon's consultation, and the surgery nurse's attention are indispensable for health professional-patient communication prior to surgical procedures and offer many opportunities to fill information gaps and alleviate anxiety. One study showed that providing information to patients with audio recording prior to cardiac surgery improved patients' knowledge and perception of control over their health status, thereby reducing anxiety and depression [38]. In today's world where technology is highly developed, informing patients about surgery with telehealth applications before hospitalization can be advantageous for patients and health professionals. Future studies need to evaluate the effectiveness of this application.

In our study, it was determined that the level of surgical anxiety was significantly higher in patients who experienced fear of surgery compared to those who did not. In addition, it was determined that the anxiety levels related to health, recovery, surgery, and invasive procedure of the patients who experienced fear were also significantly higher. In a study, it was determined that fear of surgery and anesthesia increases the level of anxiety [13]. Studies have reported that preoperative anxiety of patients is related to uncertainty about the future, inability to fulfill daily routines, economic losses, as well as fear of death, anxiety about anesthesia, postoperative pain, fear of physical disability, and waking up during surgery [11, 13].

Strengths and limitations

Our findings are significant for public health. This study reveals most of the risk factors that cause surgery anxiety. Nurses worldwide will continue to be exposed to increasing surgery anxiety among patients with increased surgical procedures with population growth. Therefore, a comprehensive understanding of surgery anxiety is important, and this study contributes to understanding and draws attention to the importance of surgery anxiety. We must seek effective interventions in future studies to prevent these conditions to reduce the burden of surgical anxiety and the risk of anxiety-related complications.

In the point-prevalence study, it was impossible to evaluate all patients in 1 day; however, the study was completed in 2 days. The absence of emergency patients may not fully reflect the prevalence of surgery anxiety in preoperative patients. A significant limitation of the study was its design. A cross-sectional design does not allow for full identification of the factors that affect surgery anxiety development.

Conclusions

Our results supported the importance of surgery anxiety in the health management of preoperative patients. Surgery anxiety is common with a prevalence of 49.3–69.5% among hospitalized preoperative patients. This study does not provide precise data on the preference or superiority of the SAQ and STAI in assessing surgery anxiety. However, the SAQ, which includes questions about surgical anxiety, determined the number of patients with surgical anxiety at a higher rate. Surgery anxiety scales can be chosen depending on the clinical setting (time, resources, staff, etc.) and the purpose of the anxiety assessment. This research showed that surgery anxiety was associated with sex, age, education level, working status, income status, type of surgery and anesthesia, the extent of the operation, anesthesia and surgery with lack of information, and fear of individuals about surgery were associated. Early assessment of surgery anxiety on admission is essential to optimizing patient care. Preoperative anxiety is potentially modifiable, and identifying these patients may provide an opportunity to increase psychological comfort and thereby improve postoperative outcomes [35]. If preoperative anxiety is not well managed, it has a limiting effect on the patient's perception of the information that should be given to the patient before the operation, as well as causing changes in vital signs, delaying the operation, and increasing the possibility of postoperative complications. The importance of a good psychological evaluation and preparation before surgery is emerging and should be done routinely. National and global interventions targeting these components can help prevent surgery anxiety from causing adverse health outcomes and potentially reverse it. There is a need for studies in which surgical anxiety is determined individually and appropriate interventions are planned, and studies evaluating the effectiveness of this on the level of preoperative anxiety and the postoperative recovery process are needed.

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Data availability On request.

Code availability Not applicable.

Declarations

Ethics approval This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Research Ethics Committee of Sivas Cumhuriyet University (No:2023–01/02).

Informed consent Informed consent was obtained from all individual participants included in the study.

Conflict of interest The author declares no competing interests.

Research involving human participants and/or animals This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Research Ethics Committee of Sivas Cumhuriyet University (No:2023–01/02).

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