Pain Management Nursing 24 (2023) 521–527

Contents lists available at ScienceDirect

Pain Management Nursing

journal homepage: www.painmanagementnursing.org

Original Research

The Effect of Preoperative Pain Fear on Postoperative Pain, Analgesic Use, and Comfort Level

Ayşe Topal Hançer*, Pervin Köksel

From the Faculty of Health Sciences Nursing Department, Sivas Cumhuriyet University, Sivas, Turkey

ARTICLE INFO

Article history:
Received 2 December 2022
Received in revised form 22 June 2023
Accepted 26 June 2023

ABSTRACT

Background: Preoperative assessment of pain fear could provide essential information for improving perioperative care and could be the first step toward targeted pain management.
Aims: The aim of this study is to determine the effect of preoperative pain fear on postoperative pain, analgesic use, and comfort level.
Method: This cross-sectional study was conducted with 201 patients in the general surgery service between January 2022 and March 2022. A sociodemographic questionnaire, Visual Analog Scale (VAS), pain fear, and general comfort scales were used for data collection. Correlation analysis was performed to examine the relationship between scales, and $p < .05$ was considered statistically significant.
Results: The mean age of the individuals participating in the study was 51.22±15.89 and 69.2% of them were women. The average score of pain fear was 63.77±21.47, and the average score of the VAS was 7.63±1.82 after the surgery before analgesics and 5.06±1.58 six hours after surgery. The mean comfort level was 132.88±9.26. A significant and positive correlation was detected between the total pain fear and the VAS score, analgesic use, and comfort level ($p < .05$).
Conclusions: In this research, findings demonstrated that as the patients' pain fear increased, postoperative pain severity and amount of analgesia increased. Providing pain management with analgesics increases comfort in patients, but it may cause secondary problems in patients who use high-dose analgesics. Therefore, reducing pain fear, which is one of the main factors in pain, is essential in pain management.

Although surgical procedures are controlled traumas, approximately 50-90% of patients experience fear before surgery (Kılınc & Ozer, 2017; Ruhaiyem et al., 2016). Fear of surgery is associated with many conditions but, the primary reason is the fear of experiencing pain (Celik & Edipoglu, 2018; Kılınc & Ozer, 2017; Ruhaiyem et al., 2016). Post-surgery pain is inevitable. In cases where the measures for pain are insufficient and the pain of the patients cannot be relieved, the quality of life of the individual decreases, daily life activities and social interactions are impaired, the length of hospital stay is prolonged, and the death rates increase (Dikmen & Ziyai, 2022). Relief of pain is therefore a fundamental human right. In particular, pain previously experienced by patients and not effectively managed can trigger pain fear more often in subsequent surgeries (Meulders & Bennett, 2018). According to the Gate Control Theory, the individual's psychological state, anxiety, and fears can activate pain stimuli and lead to the perception of pain (Unver & Turan, 2018). Fear related to pain has been operationalized as constructs distinct from, yet interacting with and affected by, pain (Wright & McNeil, 2021). Therefore, fear and anxiety are important considerations in both acute and chronic pain. Pain fear can affect the individual response to surgical intervention and postoperative pain management (Wang et al., 2019). Higher pain levels also negatively affect the process of coping with pain. To decrease postoperative pain, patients may limit mobilization and not perform activities, such as deep breathing and coughing exercises (Cremeans-Smith, 2018; Kaya & Ozlü, 2019). This situation may adversely affect the health of patients and cause not only an increase in complications but additional analgesic needs. In studies, it was determined that there is a positive relationship between the use of pain medications and the severity of the pain; therefore, effectively and efficiently measuring fear and anxiety associated with pain in healthcare settings is critical for identifying vulnerable patients (Luo et al., 2022; Wright & McNeil, 2021).

Although patients' reactions to surgery and disease vary from person to person, increased levels of fear in the preoperative pe-

* Address correspondence to Ayşe Topal Hançer, Sivas Cumhuriyet University Faculty of Health Sciences, Nursing Department, Yenisehir Neighborhood, Kayseri Street, Sivas, 58140, Turkey.
E-mail address: ays-topal@hotmail.com (A. Topal Hançer).

https://doi.org/10.1016/j.pmn.2023.06.008
1524-9042/

riod may adversely affect compliance with the treatment plan, duration of treatment, and quality of life. In addition, high postoperative pain scores and ineffective management of the pain cause decreased patient satisfaction and comfort, as well as increased patient complications and costs (Tadesse et al., 2022). In this context, as pain and the fear of pain are closely related, understanding the patient's reasons for the fear of pain is essential and should be utilized in developing plans of care.

Nurses and doctors are health professionals who work together in the care of patients, in the assessment of pain levels, and in their management. Health professionals should screen to detect pain fear in patients before surgery, be aware of the pain fear, and implement supportive strategies to increase patients' ability to cope with pain and improve the quality of patient surgical care (Rajput & Vadivelu, 2021; Unver & Turan, 2021). A preoperative assessment which includes postoperative fear of pain is essential to plan an effective pain management regimen. In preparing this study, the lack of evidence associating the fear of pain with actual pain levels, analgesic use, and comfort levels supported our goals of studying this forgotten phenomenon. Therefore, this study was conducted to determine the effect of preoperative pain fear on postoperative pain, analgesic use, and comfort level. This exploration was accomplished through the following research questions:

Research Question 1: What are the levels of fear of pain in patients undergoing surgery?

Research Question 2: How does the level of pain fear vary according to demographic and clinical variables?

Research Question 3: What is the association between pain fear and postoperative pain level in surgical patients?

Research Question 4: What is the association between pain fear and analgesic use in surgical patients?

Research Question 5: What is the association between pain fear and comfort level in surgical patients?

Methods

Study Design and Sample

This research had a descriptive-cross-sectional design. The study sample included 201 patients who received treatment between January 1st 2022 to March 30th 2022 at the general surgery department of a university hospital. The university hospital is a tertiary care center. All patients who met the criteria for participation in the study within the specified period were invited to the study. The inclusion criteria were as follows: (a) being 18 years or older, (b) volunteering to participate in the study, (c) graduating from elementary school (5-12 ages), (d) having no visual or hearing impairments, (e) no psychological or cognitive barriers which could impair communication, (f) undergoing elective surgery. The exclusion criteria were as follows: (a) any patients with physical or cognitive barriers to communication, (b) patients who did not voluntarily accept the study requirements. Figure 1 shows the number of patients included in the study. A total of 12 patients who did not complete the questionnaire during the study were excluded from the study. The study was completed with a total of 201 patients.

Data collection

All patients who agreed to participate in the study were instructed about the study details before obtaining their written consent. Data were collected after informed consent was obtained from the patients. For data security and confidentiality, only the first letters of the patients' names and surnames were used in the survey forms, and the full name was not written. The questionnaires were completed the researcher by reading them to the patients through face-to-face interviews, which took approximately 30 minutes for each patient.

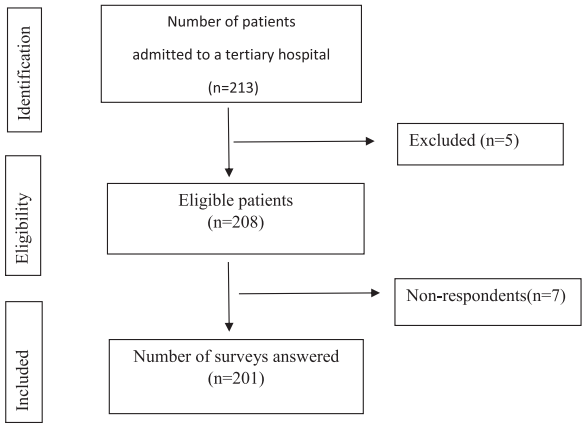

Figure 1. Flow chart of study.

Data were collected using a sociodemographic questionnaire, VAS, pain fear, and general comfort scales. The pain fear scale and sociodemographic questionnaire were presented to the patients the day before surgery. Then, the general comfort scale was given to the patient to complete at the 6th hour of the operation day for evaluating the surgical process. In addition, the pain levels of the patients were evaluated with the VAS scale on arrival to the ward after surgery and at the 6th hour postoperatively. The total analgesic doses administered on the first and second postoperative days were recorded by the investigators. No intervention was made to the patients other than the ward routine. In the ward, after the postoperative pain levels of the patients are evaluated with VAS, ordered routine analgesics are administered; however, fear of pain is not evaluated in the service routine. According to the VAS, it is evaluated as 'mild' at the level of 1-3, 'moderate' at the level of 4-7, and 'severe' at the level of 8-10. Service routine drug treatment is carried out according to the World Health Organization analgesic ladder (Anekar et al., 2023).

Instruments

Sociodemographic questionnaire

The form was created by the researchers in line with the literature (Ju et al., 2019; Tamer, 2018; Unver & Turan, 2018) and included a total of 15 questions on patients' sociodemographic information, type of current surgery, trauma history, previous surgery experience, severe pain experience, knowledge about the surgery, obtaining information about the surgery from the health personnel, the preoperative mood of the patient, whether the patient had a coping method to reduce pain fear and the type and amount of analgesics used on the 1st and 2nd postoperative days.

Postoperatıve pain fear scale

The Postoperative Pain Fear Scale, developed by Unver and Turan (2021), allowed for a quick evaluation of the patient's preoperative fear of pain postoperatively. This uni-dimensional scale has 10 items without any reverse expressions. Patients rate the level of their fear of pain in relation to the items on the scale by selecting one of the values ranging from 0 (not at all afraid) to 10 (very afraid). The lowest possible total score is 0 and the highest possible total score is 100. A high score on the preoperative evaluation suggests that the patient has a high fear of postoperative pain. The Cronbach's alpha coefficient value of the scale was determined as 0.91 (Unver & Turan, 2021). In this study, Cronbach's Alpha value of 0.96 was calculated.

General comfort scale

The General Comfort Scale was developed by Kolcaba (2003) to identify the comfort-related needs of patients and assess nursing practices designed to provide and improve physical ease and well-being. Turkish validity and reliability study was carried out by Kuguoglu & Karabacak (2008). The scale was created based on a taxonomic structure to comprise three levels and four dimensions of the theoretical components of comfort. The scale is a 4-point Likert-type scale consisting of 48 items and comfort dimensions, namely, physical (12 items), psychospiritual (13 items), environmental (13 items), and sociocultural (10 items) dimensions. In terms of level, comfort is categorized as "relief (15 items)," "ease (17 items)," and "transcendence (15 items)." There are positive and negative items on the scale, and negative items are evaluated by reverse coding. A minimum of 48 and a maximum of 192 points can be obtained from the scale. On the scale, scores between 0-48 indicate low comfort, 49-96 moderate comfort, 50-144 good comfort, and 145-192 high comfort. The Cronbach's alpha coefficient value of the scale was determined as 0.85 (Kuguoglu & Karabacak, 2008). In this study, Cronbach's Alpha value of 0.908 was calculated.

Visual Analog Scale (VAS)

The level of pain was measured with a VAS. In the literature, the VAS is frequently used in diagnosing the severity of pain (Lee et al., 2003). Patients were asked to rate their pain on a scale of 0-10. If the value given was zero, it was considered "No Pain", whereas if the value given was 10, it was considered "Unbearable Pain".

Ethical consideration

This research was approved by the local University Ethics Committee (2021-10/36) and the hospital (93596471-010.99-E.3021). All patients were informed about the nature of the study and written informed consent was obtained. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Statistical analysis

The data obtained in the study were evaluated with the SPSS 23.00 program. 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 $p < .05$ was considered statistically significant.

Results

Table 1 shows the comparison of the demographic data of the patients with the total mean scores of pain fear and comfort scales. In Table 1, the mean age was 51.22±15.89, 69.2% were female, 36.8% were elementary school graduates (1-5 years), 50.2% had at least one chronic disease, 72.6% had a history of previous surgery, 76.6% had severe pain experience, 56.2% did not receive any information about the surgery from the health personnel, 44.3% had preoperative fear stated, and 53.2% of them used an application to reduce their fear before the surgery. Type of surgery, sex, education, presence of chronic disease, history of surgery, the experience of severe pain, knowledge about the surgery, lack of education from a health professional, experiencing preoperative fear, and making a practice to reduce pain fear before surgery had significant mean differences ($p < .05$). It was also determined that those who received tramadol (opioid) 100 mg intravenously (IV) on the first postoperative day and 100 mg IV dexketoprofen (nonsteroidal anti-inflammatory: NSAID) on the second postoperative day had significantly higher mean scores on the fear of pain and comfort scale ($p < .05$).

In Table 2, the mean scores of the VAS, comfort, and pain fear scales are given. The mean preoperative pain fear scale total score was 63.77±21.47, the mean pain VAS on arrival to the ward after surgery was 7.63±1.82, the mean VAS at the postoperative 6th hour was 5.06±1.58, and the mean 6th-hour postoperative comfort total score was 132.88±9.26.

Table 3 demonstrates the strongly positive significant relationship between pain fear, VAS, and analgesia in the immediate postop periods and day 1. A moderately significant positive correlation was found between pain fear and 6th-hour postoperative comfort and the amount of analgesic used on day 2 ($p < .001$). In addition, a positive and moderately significant relationship was found between general comfort and the amount of analgesic used on days 1 and 2 ($p < .05$).

Discussion

Surgery causes pain and fear in patients in general (Dueñas et al., 2016). Although many factors cause fear of surgery, one of the most important factors is the fear of experiencing pain (Kılınc & Ozer, 2017; Ruhaiyem et al., 2016). Although pain fear is a very important indicator, studies on this subject are very limited. Therefore, this study was conducted to determine the effect of preoperative fear on postoperative comfort, pain, and analgesic use. In addition, it was also aimed to raise awareness of this issue.

Postoperative pain is a subjective phenomenon and subjective experience (Ju et al., 2019; Tamer, 2018). Therefore, pain and fear of experiencing pain are strongly influenced by personal parameters such as genetics, sex, social and cultural factors, type of surgery, duration, quality of post-operative care, and past pain experience (Michaelides & Zis, 2019; Sommer et al., 2010). The early detection of pain fear may contribute to more effective intervention and postoperative pain management (Corke, 2013). In this study, when examined in terms of the type of surgery, the total mean score of pain fear was found to be significantly higher in those who had stoma opening and closing surgery. It may have increased pain fear because the stoma is mostly opened after major surgical operations, such as those involved in the treatment of colon cancer, and it creates a necessary life change in individuals and limitations in function. In a study, it was reported that fear of pain is associated with limitations in function (LeMay et al., 2011). In the literature, it has been stated that patients who will undergo major surgery experience higher fear (Kovářová & Zeleníková, 2020).

In this study, the total mean scores of pain fear were found to be significantly higher in the female sex than in the male sex. In addition to the studies in the literature reporting that sex does not affect fear of surgery (Schnabel et al., 2012), there are many studies stating that pain fear is higher in females (Bağdigen & Ozlü, 2018; Kovářová & Zeleníková, 2020; Ruhaiyem et al., 2016). Sociocultural appreciation of high pain tolerance and cultural beliefs (i.e., men do not experience pain) may have led to this difference in adulthood. It may also be due to the fact that women express their emotional states more easily than men (Savk et al., 2022).

In our study, it was determined that as the education level increased, the pain fear decreased significantly. In a study that was similar to our study, most of the patients with low education levels had a fear of experiencing moderate-to-severe pain (Ustunel & Erden, 2022). Acar et al. (2016) found that educational levels determined the patient's ability to cope with pain and subsequently their pain treatment was effectively increased. The present

Table 1
Comparison of the Demographic Data of Patients with the Total Mean Scores of Pain Fear and Comfort (n = 201).

Characteristics	*n*	%	Pain Fear x ±SD	Comfort x ± SD
Mean age (years/ x ±SD) 51.22±15.89	Min=19	Max=91		
Type of current surgery				
Hernia	47	23.4	69.85±21.41	133.82±10.10
Cholecystectomy	67	33.3	57.26±20.09	129.47±8.11
Hemorrhoidectomy	12	6.0	57.16±15.02	133.25±5.52
Breast Mass	20	10.0	82.30±16.95	140.20±6.59
Anal fissure	2	1.0	76.00±16.95	140.00±6.59
Rectum cancer	4	2.0	82.00±20.78	133.50±2.88
Thyroidectomy	22	10.9	58.09±13.65	134.72±10.66
Pilonidal Sinus	4	2.0	39.00±9.23	130.50±7.50
Appendectomy	6	3.0	49.00±16.56	123.33±0.51
Lipoma	2	1.0	32.00±9.27	118.00±2.88
Mesenteric İschemia	2	1.0	50.00±15.08	152.00±2.67
Stomach cancer	3	1.5	41.00±10.02	128.00±3.88
Stoma Opening/closing	10	5.0	87.20±15.65	137.00±5.53
F/p			3.272/**.001**	2.903/**.001**
Sex				
Female	139	69.2	68.75±19.93	134.00±9.21
Male	62	30.8	52.61±20.74	130.37±8.96
t/p			5.158/**.001**	2.627/**.010**
Marital status				
Married	176	87.6	64.49±21.76	132.94±9.40
Single	25	12.4	58.72±18.91	132.44±8.42
t /p			1.400/.171	0.275/.785
Education status				
Literate	22	10.9	72.63±25.42	136.00±10.86
Elementary school (5-12 ages)	74	36.8	64.68±21.23	134.16±9.50
Secondary school	40	19.9	65.45±17.59	132.02±10.58
High school	45	22.4	59.40±19.22	130.68±6.47
University	20	10.0	57.15±26.91	131.35±8.16
F/p			3.631/**.001**	2.607/**.001**
Chronic disease				
No	100	49.8	56.73±14.75	132.00±8.95
DM	15	7.5	61.24±23.76	131.33±7.11
HT	29	14.4	67.75±19.79	132.51±10.21
DM and HT, CAD	30	14.9	72.03±20.05	137.23±8.24
ARF/CRF	9	4.5	65.80±15.51	129.20±6.83
Cancer	6	3.0	74.83±21.43	135.83±6.58
CAD	12	6.0	57.83±12.67	126.83±9.14
F/p			2.502/**.001**	2.187/**.001**
Working status				
Yes	31	15.4	56.16±23.50	130.29±7.93
No	170	84.6	65.16±20.85	133.35±9.43
t/p			1.994/.053	1.915/.062
Trauma history				
Yes	18	9.0	70.66±15.13	133.16±8.16
No	183	91.0	63.09±21.91	132.85±9.39
t/p			1.430/.154	0.154/.879
Have you had surgery before?				
Yes	146	72.6	67.96±19.40	134.16±8.65
No	55	27.4	52.65±22.87	129.47±10.04
t/p			4.403/**.001**	3.063/**.003**
Severe pain experience				
Yes	154	76.6	70.22±18.17	134.75±8.85
No	47	23.4	42.65±17.66	126.72±7.90
t/p			9.300/**.001**	5.927/**.001**
Does she/he know about her surgery?				
Yes	134	66.7	59.11±22.55	130.27±8.31
No	67	33.3	73.08±15.49	138.08±8.92
t/p			4.558/**.001**	5.985/**.001**
The status of getting information from the health professional				
Yes	88	43.8	56.59±22.13	129.19±7.53
No	113	56.2	69.37±19.25	135.75±9.50
t/p			4.372/**.001**	5.304/**.001**
What is the mood before the surgery?				
Mood calm	49	24.4	37.89±12.42	126.69±6.16
Anxious	61	30.3	63.62±14.98	131.68±8.66
Fearful	89	44.3	78.12±15.15	137.14±9.08
Tired	2	1.0	64.00	131.00
F/p			8.797/**.001**	3.458/**.001**

(*continued on next page*)

Table 1 (*continued*)

Characteristics	*n*	%	Pain Fear x ±SD	Comfort x ± SD
Is there a coping method used to reduce pain fear?				
Yes	107	53.2	59.63±24.10	131.90±8.78
No	94	46.8	68.48±16.95	133.98±9.72
t/p			2.973/**.003**	1.585/**.015**
Type and amount of analgesic used on the first day in postoperative				
Dexketoprofen 50mg	34	16.9	35.17±9.25	125.88±6.76
Dexketoprofen 100 mg	40	19.9	46.50±11.34	127.27±8.19
Tramadol 100 mg	127	63.2	87.03±10.66	139.19±7.36
F/p			27.957/**.001**	5.408/**.000**
Type and amount of analgesic used on the second day in postoperative				
Dexketoprofen 50 mg	132	65.7	54.93±18.05	130.76±8.84
Dexketoprofen 100 mg	69	34.3	80.68±16.92	136.92±8.75
t/p			9.801/**.001**	4.706/**.001**

DM = diabetes mellitus; HT = hypertension; CAD = coronary artery disease; ARF = acute renal failure; CRF = chronic renal failure; *F* = ANOVA; *t* = independent sample t-test.
Bold values indicate statistical significance.

Table 2
Scales Total Score Averages.

	x ± SD	Min	Max
Preoperative pain fear total score mean	63.77±21.47	22	100
On arrival to the ward after surgery VAS mean	7.63±1.82	3	10
6th hours postoperatively VAS mean	5.06±1.58	2	8
6th hours postoperatively comfort total score mean	132.88±9.26	115	153

VAS; Verbal Analog Scale.

Table 3
Correlation Analysis Between Pain Fear, on Arrival to the Ward After Surgery VAS, 6th Hours Postoperatively VAS, Comfort, First Day Analgesic Amount, and Second Day Analgesic Amount.

		Pain fear	On arrival to the ward after surgery VAS	6th hours postoperatively VAS	6th hours postoperatively comfort	First day analgesic amount	Second day analgesic amount
Pain fear	*r*	1	0.949	0.935	0.537	0.888	0.571
	p		**.001**	**.001**	**.001**	**.001**	**.001**
On arrival to the ward after surgery VAS	*r*	0.949	1	0.952	0.515	0.912	0.610
	p	**.001**		**.001**	**.001**	**.001**	**.001**
6th hours postoperatively VAS	*r*	0.935	0.952	1	0.499	0.916	0.610
	p	**.001**	**.001**		**.001**	**.001**	**.001**
6th hours postoperatively comfort	*r*	0.537	0.515	0.499	1	0.551	0.316
	p	**.001**	**.001**	**.001**		**.001**	**.001**
First day analgesic amount	*r*	0.888	0.912	0.916	0.551	1	0.476
	p	**.001**	**.001**	**.001**	**.001**		**.001**
Second day analgesic amount	*r*	0.571	0.610	0.610	0.316	0.476	1
	p	**.001**	**.001**	**.001**	**.001**	**.001**	

Bold values indicate statistical significance.

study supported these findings and indicated that fear was reduced when education regarding the surgery was provided by the healthcare professional. According to Gurlek et al. (2013), patients who were informed about pain management before surgery experienced less pain fear. According to our findings, it can be said that obtaining information about the treatment process from the health personnel before the operation reduces the fear of pain by eliminating the feeling of uncertainty in patients, thus revealing the importance of preoperative information in pain management.

In this study, pain fear was found to be significantly higher in patients with multiple chronic diseases such as diabetes, cancer, hypertension, and coronary artery disease. In particular, individuals who experience constant pain due to multiple chronic diseases may have an increased sensitivity to pain, which may cause more pain fear in these individuals. Our findings supporting this were that those who had had a surgery in which they experienced severe pain, had a feeling of fear before surgery, and did not take any action to reduce fear before surgery had significantly higher levels of pain fear. There are studies reporting contradictory results in patients with previous surgery and fear of pain. Some studies reported that patients with a previous surgery knew what to expect and their fear of pain was decreased (Göl, 2019; Temiz & Ozer, 2015); however, other studies reported the opposite (Corke, 2013; Kovářová & Zeleníková, 2020; Unver & Turan, 2018; Zeb et al., 2019). The pain fear increases with the formation of pain memory due to painful experiences in the past which could not be effectively managed, and the thought that these pains will be experienced again. Severe pain, which remains in the memories of the patients from their previous surgery, may be replaced by the pain fear in patients who will undergo surgery again. According to the Gate Control Theory, fear facilitates the transmission of pain to the brain, leading to a decrease in the pain threshold and an increase in sensitivity to pain (Phelps et al., 2021). The inability of the patients to cope with the feeling of fear before the operation may have caused the pain fear.

In this study, a positive and significant relationship was found between pain fear, VAS, and analgesia in the immediate postop periods and on days 1 and 2. It was determined that the use of opi-

oids and NSAIDs on the first postoperative day in patients with high pain fear and the doses of NSAIDs (dexketoprofen 100 mg) drug use on the second postoperative day were found to be significantly higher. In addition, in this study, a moderately significant and positive correlation was found between the amount of analgesia applied on the first day and the amount of analgesia applied on the second day. In similar studies, it was determined that patients with high levels of anxiety and fear also had high pain levels and needed more analgesics in the postoperative period (Astepe, 2018; Kovářová & Zeleníková, 2020; Robleda et al., 2014; Tadesse et al., 2022; Yılmaz et al., 2014). According to these results, pain fear is an important factor paving the way for experiencing pain in the postoperative period. Therefore, it can be said that patients with pain fear need more analgesic drugs (opioids) after surgery, and pain management becomes more difficult in these patients.

Considering the recovery time from anesthesia, comfort level was evaluated at the 6th hour after surgery so that the patients could easily answer the postoperative questions. In this study, the increase in pain level due to pain fear caused the patients to use higher levels of analgesic drugs. In addition, in the correlation analysis, there was a positive and significant relationship between the rate of analgesic drug use and the level of comfort. It is thought that the significant increase in comfort levels in the postoperative 6th hour in patients with high pain fear was due to effective pain management in parallel with increased use of analgesics. According to these results, it can be said that the patient's pain score and comfort level are closely related. In a previous study, reducing the level of pain with early postoperative care applied to the patient increased comfort level (Oren, 2018). However, increased use of analgesics may cause secondary problems in patients. Patient comfort, which is a concept traditionally associated with the art of nursing, is a very complex, individual-specific, and holistic concept (Kuguoglu & Karabacak, 2008). Today, comfort is an important parameter in quality health care. In addition, receiving health care with high comfort is one of the most basic rights of patients. Although there are different factors affecting comfort in patients, our study results draw attention to the relationship between pain level and comfort. For this reason, fear of pain that causes increases in pain levels should be determined and interventions should be made to reduce fear before surgery. To increase comfort in patients with high preoperative fear, pain management should be provided in accordance with the level of pain in the perioperative period.

Limitations

This study had several limitations. First, the study was only conducted in one center, and therefore, the results might not be generalizable to other geographic regions. Second, comfort level was evaluated six hours after surgery to allow the anesthetic effect to wear off. In this process, analgesic administration may have affected comfort level. Third, pain was only measured with the VAS instrument, and no other instruments were used. Finally, although examining various types of surgery was a strong factor in the study, analyzing more than one type of surgery together may have reduced the emphasis of the results. Therefore, further studies should be conducted to investigate the effects of preoperative pain fear in a single operation on levels of postoperative pain and analgesics used.

Conclusions

In this study, a significant and positive relationship was detected between postoperative pain level and analgesic use in patients with high preoperative pain fear. It was determined that the use of opioid drugs on the first postoperative day and NSAIDs on the second day increased in patients with high pain fear. Comfort level was also found to be significantly higher in patients who used high levels of analgesic medication due to pain fear. The mean total score of pain fear was significantly higher in patients who were going to undergo major surgery, had a history of surgery in the past and experienced severe pain, did not have information about the surgery, did not receive information from the health personnel about the surgery, expressed fear about the surgery, and were of the female sex. This study provides new evidence on the effect of pain fear on patients' pain, analgesic use, and comfort level, and calls for the development and implementation of effective measures to evaluate and address pain fear in nursing practice.

Implications for Nursing Practice

It can be said that an increase in pain fear increases pain level and analgesic drug use in patients in direct proportion. In particular, the use of drugs, such as opioids in increased doses, may cause secondary problems in patients. Thus, preoperative assessment of pain fear could provide essential information for improving perioperative care and could be the first step toward targeted pain management. Nurses should question each patient's pain history, take a detailed pain history, and routinely determine the level of pain fear with a reliable scale in the preoperative period. Nursing interventions reducing the patient's pain fear can reduce the severity of pain. Determining the situations causing pain fear and using appropriate patient-specific interventions that increase their ability to cope with pain may contribute to decreased rates of analgesic consumption and increase comfort in the postoperative period. We recommend the evaluation of interventions appropriate to the fear levels of patients in future studies. There is a need for studies with a high level of evidence that include nursing interventions in this regard. Identifying patients' pain fears before surgery can help reduce unwanted pain expectations and increase patients' ability to cope with pain.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

The authors would like to thank the patients who participated in the study and the statistician expert.

Ethics committee approval for this study was received from Sivas Cumhuriyet University Non-Interventional Clinical Research Ethics Committee (Decision No: 2021-10/38). The statistics were checked prior to submission by an expert statistician (E-mail: sbardakci@cumhuriyet.edu.tr).

References

Acar, K., Acar, H., Demir, F., & Eti Aslan, F. (2016). Determining the incidence of postsurgical pain and amount of analgesic use postsurgical pain and analgesic. *Acıbadem University Health Sciences Journal, 2*, 85–91.

Anekar, A. A., Hendrix, J. M., & Cascella, M. (2023). *WHO Analgesic Ladder*. Treasure Island (FL): StatPearls Publishing [Internet].

Astepe, B. S. (2018). The relationship between preoperative anxiety level and postoperative pain in patients with cesarean delivery. *Kocaeli Medical Journal, 7*(3), 64–69.

Bağdigen, M., & Ozlü, Z. K. (2018). Validation of the Turkish version of the surgical fear questionnaire. *Journal of Perianesthesia Nursing, 33*(5), 708–714.

Celik, F., & Edipoglu, I. S. (2018). Evaluation of preoperative anxiety and fear of anesthesia using APAIS score. *European Journal of Medical Research, 23*(1), 1–10.

Corke, P. (2013). Postoperative pain management. *Australian Prescriber, 36*(6), 202–205.
Cremeans-Smith, J. K. (2018). Fear of pain and the frequency with which healthy individuals engage in physical activity. *International Journal of Sport and Exercise Psychology, 16*(3), 300–312.
Dikmen, Y., & Ziyai, N. Y. (2022). Pain. In M. Kara-Kaşıkçı, & E. Akın (Eds.), *Basic Nursing: Fundamentals, Concepts, Principles, Practices* (pp. 383–403). Istanbul: Istanbultip Bookstore Publishing.
Dueñas, M., Ojeda, B., Salazar, A., Mico, J. A., & Failde, I. (2016). A review of chronic pain impact on patients, their social environment and the health care system. *Journal of Pain Research, 9*, 457–467.
Göl, S. (2019). *Investigation of the relationship between pain and comfort levels of patients who underwent lumbar disc herniation surgery*. İnönü University/Institute of Health Sciences Master's thesis.
Gurlek, Ö., & Yavuz, M. (2013). Application cases of preoperative education of patients by nurses working in surgical clinicals. *Journal of Anatolian Nursing and Health Sciences, 16*, 8–15.
Ju, W., Ren, L., Chen, J., & Du, Y. (2019). Efficacy of relaxation therapy as an effective nursing intervention for postoperative pain relief in patients undergoing abdominal surgery: A systematic review and metaanalysis. *Experimental and Therapeutic Medicine, 18*(4), 2909–2916.
Kaya, M., & Ozlü, Z. K. (2019). The determination of the telationship between the perception of surgical fear and social support in patients who undergoing elective surgery. *Journal of Anatolia Nursing and Health Sciences, 22*(4), 281–290.
Kılınc, M., & Ozer, A. (2017). Fear of going under general anesthesia: A cross-sectional study. *Saudi Journal of Anaesthesia, 11*(1), 128–130.
Kolcaba, K. (2003). *Comfort Theory and Practice: A Vision for Holistik Health Care and Research*. New York: Springer Publishing Company.
Kovářová, K., & Zeleníková, R. (2020). Hodnocení strachu u pacientů před plánovanou operací. *Prakt Lek, 100*(5), 240–244.
Kuguoglu, S., & Karabacak, U. (2008). Turkish version of the general comfort questionaire. *Journal of Istanbul University Florence Nightingale School of Nursing, 16*(61), 16–23.
Lee, J. S., Hobden, E., Stiell, I. G., & Wells, G. A. (2003). Clinically important change in the visual analog scale after adequate pain control. *Academic Emergency Medicine, 10*(10), 1128–1130.
LeMay, K., Wilson, K. G., Buenger, U., Jarvis, V., Fitzgibbon, E., Bhimji, K., & Dobkin, P. L. (2011). Fear of pain in patients with advanced cancer or in patients with chronic noncancer pain. *Clinical Journal of Pain, 27*(2), 116–124.
Luo, Y., He, J., Bao, L., Meng, H., Hu, C., & Chen, Q. (2022). Fear of pain as a predictor for postoperative pain intensity among the patients undergoing thoracoscopic surgery. *Pain Research & Management, 2022*, 1–6.
Meulders, A., & Bennett, M. P. (2018). The concept of contexts in pain: Generalization of contextual pain-related fear within a de novo category of unique contexts. *Journal of Pain, 19*(1), 76–87.
Michaelides, A., & Zis, P. (2019). Depression, anxiety and acute pain: Links and management challenges. *Postgraduate Medicine, 131*(7), 438–444.
Oren, B. (2018). Factors affecting the comfort and anxiety level of patients who underwent thoracic surgery. *Journal of Health Science and Profession, 5*, 324–332.
Phelps, C. E., Navratilova, E., & Porreca, F. (2021). Cognition in the chronic pain experience: Preclinical insights. *Trends in Cognitive Sciences, 25*(5), 365–376.
Rajput, K., & Vadivelu, N. (2021). Acute pain management of chronic pain patients in ambulatory surgery centers. *Current Pain and Headache Reports, 25*(1), 1–12.
Robleda, G., Sillero-Sillero, A., Puig, T., Gich, I., & Baños, J. E. (2014). Influence of preoperative emotional state on postoperative pain following orthopedic and trauma surgery. *Revista Latino-Americana de Enfermagem, 22*, 785–791.
Ruhaiyem, M. E., Alshehri, A. A., Saade, M., Shoabi, T. A., Zahoor, H., & Tawfeeq, N. A. (2016). Fear of going under general anesthesia: A cross-sectional study. *Saudi Journal of Anaesthesia, 10*(3), 317–321.
Savk, A., Kebapçı, E., & Özcan, S. (2022). Determination of disease perception and anxiety level in preoperative surgery patients. *The Journal of Tepecik Education and Research Hospital, 32*(1), 85–92.
Schnabel, A., Poepping, D. M., Gerss, J., Zahn, P. K., & Pogatzki-Zahn, E. M. (2012). Sex-related differences of patient-controlled epidural analgesia for postoperative pain. *Pain, 153*(1), 238–244.
Sommer, M., de Rijke, J. M., van Kleef, M., Kessels, A. G., Peters, M. L., Geurts, J. W., Patijn, J., Gramke, H. F., & Marcus, M. A. (2010). Predictors of acute postoperative pain after elective surgery. *Clinical Journal of Pain, 26*(2), 87–94.
Tadesse, M., Ahmed, S., Regassa, T., Girma, T., Hailu, S., Mohammed, A., & Mohammed, S. (2022). Effect of preoperative anxiety on postoperative pain on patients undergoing elective surgery: Prospective cohort study. *Annals of Medicine and Surgery, 73*, Article 103190.
Tamer, L. K. (2018). *Investigation of postoperative pain experiences in surgical patients and the quality of care provided to the patient in pain control*. Eastern Mediterranean University Master's thesis.
Temiz, Z., & Ozer, N. (2015). Comparison of postoperative pain intensity with four different pain scale. *Journal of Anatolia Nursing and Health Sciences, 18*(4), 245–251.
Unver, S., & Turan, F. N. (2018). Turkish validity and reliability study of fear of pain questionnaire-III. *Pain: The Journal of the Turkish Society of Algology, 30*(1), 18–27.
Unver, S., & Turan, F. N. (2021). Development of a new and simple postoperative pain fear scale for elective surgeries in adult patients. *Medical Bulletin of Haseki, 59*(4), 273–279.
Ustunel, F., & Erden, S. (2022). Evaluation of fear of pain among surgical patients in the preoperative period. *Journal of Perianesthesia Nursing, 37*(2), 188–193.
Wang, X., Baeken, C., Fang, M., Qiu, J., Chen, H., & Wu, G. R. (2019). Predicting trait–like individual differences in fear of pain in the healthy state using gray matter volume. *Brain Imaging and Behavior, 13*(5), 1468–1473.
Wright, C. D., & McNeil, D. W. (2021). Fear of pain across the adult life span. *Pain Medicine, 22*(3), 567–576.
Yılmaz, Y., Durmuş, K., İnal, F., Daşkaya, H., Çiftçi, T., Toptaş, M., & Vahpoğlu, A. (2014). The effects of preoperative and postoperative anxiety on postoperative pain and analgesic consumption in septoplasty. *Dicle Medical Journal, 41*(2), 288–293.
Zeb, A., Hammad, A. M., Baig, R., & Rahman, S. (2019). Pre-operative anxiety in patients at tertiary care hospital, Peshawar. *South Asian Research Journal of Nursing and Healthcare, 2*, 76–80.