

# The Relationship between Preoperative Pain Beliefs and Postoperative Pain Levels in Surgery Patients

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## Abstract

**Aim:** This study was conducted to determine the relationship between preoperative pain beliefs and postoperative pain levels in patients undergoing elective surgery.

**Methods:** This descriptive and cross-sectional study was conducted at Cukurova University Balcalı Hospital between July and September 2024 with 115 patients who met the inclusion criteria. The data of the study were collected using the Personal Information Form, Visual Assessment Scale (VAS) and Pain Beliefs Scale (PAS). Independent samples t-test was used for normally distributed data, Kruskal Wallis and Mann Whitney-U tests were used for non-normally distributed data, and Pearson correlation coefficient was calculated to determine the relationship between pain beliefs and the pain they experienced.

**Results:** The average score of the patients in the organic beliefs sub-dimension of the scale was  $2.43 \pm 0.60$ , and the average score in the psychological beliefs sub-dimension was  $2.39 \pm 0.63$ . It was determined that the average score of the patients in the organic beliefs sub-dimension was affected by surgical experience, and the average score in the psychological beliefs sub-dimension was affected by the ASA scores. It was determined that there was a positive relationship between organic beliefs and psychological beliefs, and a negative relationship between psychological beliefs and postoperative pain severity.

**Conclusion:** It can be said that patients believe that pain is both psychological and organic, and that as the severity of pain decreases, their belief that pain is psychological increases. Preoperative assessment of patients' pain beliefs and implementation of individualised education and support programmes to strengthen psychological beliefs may play an important role in reducing postoperative pain severity.


**Keywords:** Surgery, pain, pain beliefs, nurse

## 1. Introduction

Pain is defined by the International Organization for the Study of Pain as "an unpleasant sensory and emotional experience that can be defined by existing or potential tissue damage"<sup>1,2</sup>. Postoperative pain is defined as a stressful experience, as well as physical pain, for patients that begins after surgical trauma and is related to the incision location, width and type. Postoperative pain, which is acute and multidimensional, is a very challenging situation in postoperative patient management. Despite increasing efforts and policies to improve pain management in surgical patients, more than 80% of patients undergoing surgical procedures have been found to experience postoperative pain. It is reported that almost 75% of these patients experience moderate to severe postoperative pain<sup>3-6</sup>.

For this reason, in addition to evaluating and managing patients' pain, cultural and religious differences should also be taken into account. Nurses should be able to recognize and evaluate pain in order to reduce post-surgical pain and improve outcomes<sup>7</sup>.

Pain beliefs, which play an important role in perceived pain, appear as a situation related to how the person makes sense and interprets the common views, attitudes, judgments and events in the society in which he lives. Patients with negative pain beliefs experience more pain in the postoperative period and find pain management interventions less effective<sup>8</sup>. Pain beliefs; It can be defined as cognitions or thoughts about the cause of pain, its meaning, or appropriate treatments for pain. Such beliefs may be personally or culturally adopted<sup>9</sup>. Pain beliefs, an important concept in pain management, reveal how patients perceive pain. These beliefs are divided into two: psychological and organic. While organic beliefs show that pain is caused by tissue damage, trauma or other physical factors, psychological beliefs reveal that pain is related to psychological factors such as depression and anxiety. What patients believe and do about their pain generally affects their actual experiences, functionality, ability to cope with pain, attitudes towards pain, and treatment processes<sup>10-12</sup>. Developing treatment strategies to improve pain beliefs in the preoperative period is very important in order to effectively manage pain in the postoperative period. In this context, sur-

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gical nurses who comprehensively assess pain and explore pain beliefs are likely to provide quality pain management and treatment, contributing to the end of preventable pain<sup>8-13</sup>.

It is thought that correcting patients' false beliefs about pain will contribute positively to effective pain management. This study was conducted to evaluate the relationship between preoperative pain beliefs and postoperative pain severity in surgical patients.

## 2. Materials And Methods

This research was conducted in a descriptive and cross-sectional manner with the aim of determining the relationship between preoperative pain beliefs and postoperative pain levels in surgical patients.

The population of the research is Çukurova University It consists of patients who apply to Balcalı Hospital Health Application and Research Center to undergo surgery in the urology clinic. The sample of the study was calculated with G\*Power 3.1.9.7 according to the reference source.<sup>10</sup> According to the power analysis correlation, the medium effect size ( $d = 0.3$ ) was calculated with a margin of error of 0.05 and a power of 0.90 and was determined as 112. The sample of the study consisted of 115 patients who volunteered to participate in the research and met the inclusion criteria within the relevant date range in which the research was planned to be conducted.

### Criteria for inclusion in the research:

- ✓ Being literate,
- ✓ Being 18 years or older,
- ✓ Being conscious,
- ✓ Ability to understand and speak Turkish and not have hearing or visual impairment,
- ✓ Having undergone elective surgery
- ✓ Agreeing to participate in the research.

Data were collected using the 'Personal Information Form' created by the researcher by scanning the literature, the 'Visual Assessment Scale' (VAS) and The Pain Beliefs Questionnaire (PBQ) to evaluate pain.

The 'Personal Information Form' created by the researcher in line with the literature includes 11 questions regarding the patients' socio-demographic, disease-related and pain-related characteristics (age, gender, marital status, educational status, employment status, chronic disease, surgical experience, pain levels, etc.). contains<sup>1,14</sup>.

### Visual Analog Scale (VAS)

Visual Analog Scale (VAS), used to measure pain, consists of a scale that is evaluated by making markings on a 100 mm or 10 cm vertical or horizontal line, at one end of which there is no pain, and at the other end, where there is the most severe pain. When using the VAS developed by Price et al. (1983), patients are informed that they should mark any area according to the presence and severity of pain among the determined points<sup>15</sup>. 1-4, 5-6 and 7-10 indicate mild, moderate and severe pain. VAS scores immediately after the surgery were not evaluated because some of the patients were still under anesthesia and some received analgesia before leaving the surgery. VAS evaluation was performed at the 8th, 16th and 24th hours.

### The Pain Beliefs Questionnaire (PBQ)

The Pain Beliefs Questionnaire (PBQ) was developed by Edwards et al. in 1992 to evaluate beliefs about the cause and treatment of pain. In our country, the validity and reliability of the scale was determined by Berk in 2006 and adapted to Turkish. The Pain Beliefs Questionnaire measures the source and consequences of pain in two different ways: psychological and organic. These are organic beliefs consisting of 8 items and psychological beliefs consisting of 4 items.

- Organic Beliefs: Articles 1, 2, 3, 5, 7, 8, 10, 11,
- Psychological Beliefs: Includes items 4, 6, 9, 12<sup>16-18</sup>.

Patients are asked to mark the item that best suits them out of 6 options ranging from 1st "never" to 6th "always". Scores vary between 1 and 6 for each item.

In the reliability study conducted by Edwards et al., the Cronbach Alpha coefficient was found to be 0.71 for the organic beliefs subtest and 0.73 for the psychological beliefs subtest<sup>1,5,19</sup>. In our research, the Cronbach Alpha coefficient was found to be 0.69 for the organic beliefs subtest and 0.62 for the psychological beliefs subtest. Research data was collected through face-to-face interviews between July and October 2023. Between the data collection dates, patients who would undergo surgery who met the sampling inclusion criteria were met and informed about the purpose of the study. Before collecting data, patients were informed by the researcher about the purpose and method of the research. It was explained to the patients that the information obtained within the scope of the research would be kept confidential and would be used only for scientific study purposes. Verbal consent was obtained from the patients before the research. Then, the Personal Information Form, Visual Analog Scale and The Pain Beliefs Questionnaire were filled in when the patients felt comfortable, in a way that would not affect the treatment and care processes. Data collection took approximately 10 minutes. The patients were then thanked for participating in the study.

**Table 1**

### Distribution of patients' demographic characteristics

	X ± SD	Min-Max
Age	53.37±15.08	18-75
Pain level	3.27±2.04	0-10
	n	%
Gender		
·Woman	53	46.1
·Male	62	53.9
Marital status		
·Married	93	80.9
·Single	22	19.1
Education level		
·Primary education	62	53.9
·Secondary education	32	27.8
·University	21	18.3
ASA score		
·ASA I	66	57.4
·ASA II	49	42.6
Anesthesia Type		
·General anesthesia	91	79.1
·Local anesthesia	24	20.9
Surgical Experience		
·Yes	84	73.0
·No	31	27.0
More pain than expected		
·Yes	48	41.7
·No	67	58.3

\*n:number, %:percentage, X:mean, SD:Standard deviation, Min:Minimum value, Max:Maximum value

**Table 2**  
Scale sub-dimension and total score averages of the patients

	X ± SD	Min-Max	Scale Min-Max
Organic Beliefs	2.43±0.60	1-4.1	1-6
Psychological Beliefs	2.39±0.63	1-4	1-6

\*n:number, %:percentage, X:mean, SD:Standard deviation, Min:Minimum value, Max:Maximum value

**Table 3**  
Comparison of patients' sociodemographic data and scale subscale score averages

	Organic Beliefs X̄ ± SD	Psychological Beliefs X̄ ± SD
Gender		
·Woman	2.41±0.52	2.36±0.60
·Male	2.45±0.67	2.41±0.66
Test	t=0.367 p=0.714	t=0.428 p=0.669
Marital status		
·Married	2.43±0.59	2.41±0.64
·Single	2.42±0.64	2.30±0.63
Test	MW-U=1019.000 p=0.997	MW-U=920.000 p=0.457
Education level		
·Primary education	2.41±0.55	2.46±0.51
·Secondary education	2.30±0.47	2.32±0.67
·University	2.67±0.85	2.30±0.87
Test	KW=4.395 p=0.111	KW=0.444 p=0.801
ASA score		
·ASA I	2.41±0.66	2.29±0.69
·ASA II	2.46±0.51	2.53±0.54
Test	t=-0.426 p=0.671	t=-2.127 p=0.036
Anesthesia Type		
·General anesthesia	2.44±0.56	2.42±0.62
·Local anesthesia	2.38±0.74	2.28±0.68
Test	t=0.448 p=0.665	t=0.986 p=0.327
Surgical Experience		
·Yes	2.51±0.61	2.43±0.63
·No	2.21±0.52	2.29±0.64
Test	t=2.386 p=0.019	t=1.074 p=0.285
More pain than expected		
·Yes	2.39±0.39	2.45±0.60
·No	2.46±0.72	2.35±0.66
Test	t=-0.681 p=0.497	t=0.889 p=0.376

\*X: mean, SD: Test statistic value using standard deviation, t: t test in independent groups, KW: Kruskal Wallis analysis, MW-U: Mann Whitney-U test

Statistical analysis of the data obtained was made using the SPSS 22 (Statistical Package of Social Science) package program. Descriptive statistics were used during the evaluation of the data. Independent samples t-test was used for normally distributed data, Kruskal Wallis and Mann Whitney-U tests were used for non-normally distributed data, and Pearson Correlation coefficient was calculated to determine the relationship between pain beliefs and the severity of pain experienced. The results were evaluated at the α=0.05 significance level.

In order to conduct the research; Approval from the ethics committee of a university (Decision no: 135/40 Date: 14.07.2023) and necessary institutional permissions were obtained from the hospital where the research was conducted. Within the scope of the research, patients were given information about the research, the purpose of the research was explained, and verbal consent was obtained from the patients indicating that they agreed to participate in the research. Patients were informed that their choice to participate in the study and the research results would not affect their treatment/care. The research was conducted in accordance with the Declaration of Helsinki.

### 3. Results

The average age of the patients was 53.37±15.08%, 53.9% were male, 80.9% were married, 53.9% were primary school graduates, 57.4% were ASA 1, 73% were It was determined that 0 patients had surgical experience, 79.1% received general anesthesia, and 58.3% did not experience more pain than expected. The pain level experienced by the patients was found to be 3.27±2.04 (Table 1).

The average score of the patients from the organic beliefs sub-dimension of the scale was 2.43±0.60, and the average score from the psychological beliefs sub-dimension was 2.39±0.63 (Table 2).

It was determined that the average score of the patients in the organic beliefs sub-dimension was due to surgical experience, and the average score of the patients in the psychological beliefs sub-dimension was statistically significantly different compared to their ASA scores (p < 0.05) (Table 3).

It was determined that there was a positive relationship between organic beliefs and psychological beliefs, and a negative relationship between psychological beliefs and postoperative pain severity (p < 0.05) (Table 4).

**Table 4**  
Relationship between postoperative pain level and pain beliefs

		Organic Beliefs	Psychological Beliefs	Pain Level
Organic Beliefs	Pearson	1.000	0.310**	-0.133
	p	.	0.001	0.156
	N	115	115	115
Psychological Beliefs	Pearson		1.000	-0.225*
	p		.	0.015
	N		115	115
Pain Level	Pearson			1.000
	p			.
	N			115

\*α significance level was taken as 0.05, p: used test statistic value, N: number

## 4. Discussion

Pain experience varies widely among patients. Pain beliefs can be defined as cognitions or thoughts about the problem of pain<sup>9</sup>. Although modifiable, the fundamental characteristics of beliefs can make them difficult to identify and target; because beliefs are not always rational, that is, they can persist even after the facts are presented<sup>12</sup>. The findings obtained as a result of the analysis of the research data were discussed in the light of the relevant literature. The findings examined emphasize the importance of taking pain beliefs into account in the preoperative period.

The average score of the patients in the organic beliefs sub-dimension of the scale was  $2.43 \pm 0.60$ , and the average score in the psychological beliefs sub-dimension was  $2.39 \pm 0.63$ . Disceken and Kose reported that patients who underwent abdominal surgery and had high-intensity pain in the first 24 hours postoperatively had higher organic and psychological pain beliefs<sup>10</sup>. Both this study and the studies in the literature suggest that pain beliefs may have an active role in the pain experienced by surgical patients, and that learning the pain beliefs of surgical patients, as well as implementing nursing interventions to correct false and negative pain beliefs, can help surgical nurses provide effective postoperative pain control<sup>1,5,10</sup>. The fact that organic and psychological beliefs scores vary according to studies suggests that pain beliefs arise from variables such as medical diagnosis, location of pain, severity of pain, and age.

In the literature, postoperative pain; It is stated that the patient's personal characteristics, education, culture, beliefs about pain, knowledge and experience, preoperative preparation process, type of surgery, location, duration, complications, anesthetic techniques applied, and the nature and quality of the postoperative period are affected<sup>3,5,20</sup>. In the study, it was determined that the average score of the patients in the organic beliefs sub-dimension was affected by surgical experience, and the average score in the psychological beliefs sub-dimension was affected by the ASA scores. This finding shows that there is a significant relationship between patients' pain beliefs and ASA scores. Possibly, patients with high ASA scores focus more on pain to cope with more serious health problems, which may have an impact on their organic beliefs. These results highlight the importance of considering psychological and medical factors together when assessing patients' pain perception and management. These differences are closely related to the way patients perceive pain and the meaning they attribute to pain<sup>21</sup>.

Health professionals should determine patients' pain-related beliefs in the preoperative period, understand patients' beliefs, and adapt pain management strategies accordingly. In the study, a positive moderate relationship was found between organic beliefs and psychological beliefs, and a negative low level of relationship between psychological beliefs and postoperative pain level. It is stated in the literature that there is a significant relationship between the severity of pain and organic pain beliefs and that organic pain beliefs and psychological pain beliefs affect each other. Studies show that patients with negative pain beliefs experience more pain in the postoperative period<sup>8,22-25</sup>. In Bağcı's study on transplant patients, which is one of the limited studies examining pain beliefs in surgical patients, it is reported that both psychological and organic pain beliefs of patients with high pain levels are parallelly high<sup>14</sup>. In their study on the subject, Babadağ and Alparslan reported that the level of pain is affected by the relationship between organic and psychological beliefs about pain<sup>26</sup>. In the study conducted by Ursaavaş and Yaradılmış, it was stated that there was no relationship between the level of pain experienced after total knee and hip replacement surgery and pain beliefs<sup>11</sup>. Despite this, although there are studies on pain in urological surgery in the literature<sup>27</sup> no study has been found that specifically reveals the characteristics that affect pain beliefs.

### 4.1. Limitations of the research

The findings obtained are limited to the answers given by the patients participating in the research. It is important to regularly evaluate pain belief levels. It would be useful to organize training sessions to increase their awareness on this issue. Conducting interpretive qualitative research as well as comprehensive survey-type research in scientific studies will enable the subject to be examined in depth.

## 5. Conclusion

As a result, it appears that urology patients' pain beliefs in the preoperative period have a significant effect on postoperative pain level. It was concluded that patients believed that the pain had both psychological and organic origins. In addition, it can be said that patients with a high belief that the pain is of psychological origin have lower pain level. For this reason, surgical nurses should focus on understanding and improving patients' pain beliefs and developing new approaches. In this context, it may be recommended that surgical nurses determine the factors affecting patients' pain beliefs with larger and different sample groups and provide counseling to improve their pain beliefs.

### Statement of ethics

Ethical approval was obtained from the Cukurova University Faculty of Medicine Clinical Research Ethics Committee and the study was conducted by the principles of the Declaration of Helsinki (Decision no: 135/40 Date: 14.07.2023).

### Source of Finance

The authors declare that they have received no financial support for this study

### Conflict of interest statement

The authors declare that they have no conflict of interest.

### Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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