

Investigating Relationships Between Pain, Comfort, Anxiety and Depression in Surgical Patients

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Abstract

BACKGROUND/AIMS: The aim was to investigate the relationships between levels of pain, comfort, anxiety and depression in patients undergoing surgery.

MATERIALS AND METHODS: This study is of descriptive analytic design. The universe of the study consisted of the patients in the surgical wards of two hospitals in western Turkey who had undergone surgery. The study sample comprised 245 patients. The Shapiro-Wilk normality test was used to assess normal distribution. Number, percentage, t-test, ANOVA and correlation analysis were used to evaluate the data of the study.

RESULTS: The patients' mean pain and comfort score was 3.46 ± 1.71 , 4.27 ± 0.59 . The mean score for anxiety was 10.64 ± 3.59 and the mean depression score was 8.51 ± 2.90 . A weak, negative correlation was found between the patients' anxiety and comfort levels, while there was a weak but positive correlation between their anxiety and pain levels. A weak and negative correlation was found between comfort and pain levels.

CONCLUSION: The result of the study was the finding that the patients' levels of pain were low and their comfort levels were good. It was determined that the tendency of patients to anxiety and depression was mild. Providing effective pain control will positively contribute to the patient's anxiety, depression and comfort during the postoperative period. Preoperative music therapy and postoperative back massage can be recommended.

Keywords: Pain, comfort, anxiety, depression, postoperative

INTRODUCTION

The aim of surgery is to free patients from defects and deformities, ensure the continuation of organ functions, reduce mortality rates, eliminate pain and raise the level of quality of life. However, surgical interventions bring about psychological, physical and social traumas that create a stress response in the patient.¹ Because of this, depending on the degree to which an individual feels threatened, surgery can lead to problems such as anxiety and depression.² This creates a potential for

complications, increases the intensity of the pain perceived by the patient and extends the period of stay in the hospital.³ Postoperative pain is related to the mediators secreted from the incision site. The intensity of pain however varies depending upon the patient, the surgical intervention, the equipment used, the position of the patient, and the effectiveness of pain control.^{4,5} It has been found that most patients experience moderate to severe pain postoperatively.^{3,6,7} In one study, 86% of patients who underwent surgery experienced post-operative pain, and 75% of those who reported pain defined the severity

To cite this article: Karacabay K, Savcı A, Kabu Hergül F. Investigating Relationships Between Pain, Comfort, Anxiety and Depression in Surgical Patients. Cyprus J Med Sci 2022;7(1):40-47

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Received: 29.01.2020
Accepted: 12.04.2020



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as moderate to post-operative period.⁸ On the first postoperative day, it was reported that pain scores were highest after obstetric and orthopedic/traumatic procedures, but high scores after common small surgical procedures such as appendectomy, cholecystectomy, hemorrhoidectomy, tonsillectomy, and some laparoscopic procedures.³ Insufficient pain control causes delayed mobilization and increases morbidity and mortality in the event of complications.^{9,10} Furthermore, postoperative pain is known to be an important parameter that reduces the patient's level of comfort.¹¹⁻¹³ Kolcaba¹⁴ defines comfort as a concept that has physical, sociocultural, psychospiritual and environmental dimensions. Health is the state at which all of these dimensions are in alignment and nurses try to make an effort to improve these aspects of well-being.

Nurses provide aim to provide a holistic and humanistic approach to identifying and treating an individual's present and potential problems in terms of the person's physiological and psychosocial needs. In surgical patients, effective pain control and maintaining comfort is one of the most important responsibilities of the surgical nurse.^{7,15} Many different approaches are used for pain control, pharmacological and nonpharmacological. While drugs are used to treat the somatic dimension of pain, non-pharmacological methods aim to treat the affective, cognitive, behavioral and sociocultural dimension of pain.^{16,17} Nonpharmacological interventions are effective not only in pain control, but also in relieving anxiety and increasing the comfort of the patient. These interventions are relaxation techniques, taking attention in another direction, music, imagination, massage, positioning, transcutaneous electrical nerve stimulation (TENS), etc. Additionally, therapeutic touch and chat are also effective interventions.^{9,16,18}

Studies have indicated that music therapy is effective in reducing pain and anxiety.^{19,20} It was determined that listening to the music preferred by the patient in the preoperative period reduces the anxiety of the patient and regulates the hemodynamic parameters. It was also found to increase patient satisfaction in the postoperative period.²¹ In the study by Demir and Saritas²², it was found that back massage applied to patients after liver transplantation had a positive effect on life findings. Additionally, the pain scores of the patients who were massaged were determined to be lower and their comfort levels were higher.

There are different studies examining the pain of patients undergoing surgical intervention in the nursing literature, the use of analgesics in pain control and the role of the nurse,^{4,15} the relationship of pain with anxiety, satisfaction, comfort and activity.^{3,5,12} However, no study investigating the relationship between pain, comfort, anxiety and depression has been found in all surgical clinics. This is an investigation into the relationships between levels of pain, comfort, anxiety and depression in patients undergoing surgical interventions.

Research Questions

What are the levels of pain, comfort, anxiety and depression of patients undergoing surgery?

Is there a relationship between pain, comfort, the tendency of anxiety and the tendency of depression of patients undergoing surgery?

MATERIALS AND METHODS

Design

The study is of descriptive analytic design.

Sample and Setting

The universe of the study consisted of the patients who had undergone surgery and were hospitalized in the surgical wards of two hospitals in western Turkey. The study sample comprised 245 patients of the ages 18 and over, who were at least in their second postoperative day and were time- and place-oriented. Individuals who were being provided mechanical ventilation support or had hearing loss was not included in the study.

Sample Size

A power analysis at a confidence interval of 0.05 and 90% power was performed in the light of the literature and it was found that the sample size would have to consist of at least 230 individuals [Power Analysis and Sample Size (PASS) software]. Against the possibility that there would be data loss, the study was conducted with 245 individuals who comprised the sample.

Instruments

The data for the study were collected with a Patient Information Form, the Brief Pain Inventory, the Perianesthesia Comfort Questionnaire, and the Hospital Anxiety Depression Scale.

Patient Information Form: This form consisted of 10 questions on the individual's age, gender, education, diagnosis, surgery, the clinic where the individual was hospitalized, the patient's previous experience with hospitalization and surgery, and of notations on how many days the patient had been in the hospital and how days had passed after surgery.

Brief Pain Inventory (BPI): Cleeland and Ryan²³ developed this inventory. Dicle et al.²⁴ carried out the validity and reliability study of the Turkish version of the inventory. The BPI contains four questions on the intensity of pain and seven questions on the effect of the pain on various functions (general activity, emotional state, walking, interpersonal communications, sleep, taking pleasure out of life). Each item is assessed on the basis of 0–10 points. Cronbach's alpha coefficient for pain intensity was found to be 0.79; the effect of pain on the various functions was 0.80. It has been reported that BPI is a valid and reliable instrument that can be used to assess postoperative pain

intensity.²⁴ The Cronbach Alpha coefficients for pain intensity for this study were 0.82, the effect of pain on the various functions were 0.85.

Perianesthesia Comfort Questionnaire (PCQ): Kolcaba and Wilson²⁵ developed and Üstündağ and Aslan²⁶ carried out the validity and reliability study of the Turkish version of the questionnaire. The instrument contains 24 items that query the individual's self-concept and feelings reflecting thought processes before and after the surgical intervention. Each statement in the instrument receives a response on a Likert-type scale ranging from 1–6. The highest possible score on the scale is 144, the lowest is 24. Lower scores indicate that comfort is at a poor level, higher scores that comfort is at a good level. Üstündağ and Aslan²⁶ conducted the Turkish validity and reliability study and found a Cronbach's alpha coefficient of 0.83. In this study, the Cronbach alpha value was found to be 0.84.

Hospital Anxiety and Depression Scale (HADS): Zigmond and Snaith²⁷ developed this scale. Aydemir et al.²⁸ adapted to Turkish and its validity and reliability were tested. Anxiety and depression are the headings of its subscales. The aim of the scale is not to make a diagnosis but to quickly screen individuals with physical illness to identify risk groups in terms of anxiety and depression. The scale can also be used in the assessment of changes in the emotional state of a patient. The scale is made up of 14 items, seven of which explore the symptoms of depression and seven the symptoms of anxiety. The responses are assessed in Likert form and are scored on a scale of 0–3. The lowest possible score an individual can receive from both subscales is 0; the highest is 21. The cut-off points on the Turkish version of the scale is 10 for the anxiety subscale (HADS-A) and seven on the depression subscale (HADS-D). Accordingly, individuals scoring above these points are accepted as being at risk.²⁸ The Cronbach Alpha coefficients for this study were 0.83, for anxiety and 0.87 for depression.

Data Collection

The authors collected the data for the study through face-to-face interviews with consenting participants in their rooms after their surgery. Data from each individual were collected in approximately 15–20 minutes.

Statistical Analysis

Data analysis was performed electronically using the Statistical Package for the Social Sciences (SPSS) for Windows 22.0 (SPSS IBM Corp.; Armonk, NY, USA). Calculations were made at a 95% level of confidence. The Shapiro-Wilk normality test was used to assess normal distribution. Numbers, percentages, the t-test, ANOVA and correlation analysis were employed. The level of statistical significance was set at $p < 0.05$.

Ethics Statement

Ethics committee approval for the study was obtained from the Ethics Committee of Pamukkale University (decision no: 2017/50265, date: 01.08.2017) and from the institution where the study was conducted. The participants in the study were informed about the research and their written consent was taken.

RESULTS

The mean age of the study participants was 54.77 ± 17.49 years. The mean number of their postoperative days was 3.46 ± 1.59 and the mean duration of their hospitalization was 6.31 ± 4.70 days. Of the patients, 46.5% ($n=114$) were female; 69.2% ($n=145$) had an elementary school education. Of the participants, 24.9% ($n=61$) were patients in the general surgery department. The patients who had a previous history of hospitalization represented 77.2% ($n=190$); 66.3% ($n=163$) had a history of prior surgery (Table 1).

The patients' mean pain score was 3.46 ± 1.71 ; their mean comfort score was 4.27 ± 0.59 . The mean score for anxiety was 10.64 ± 3.59 and that for depression was 8.51 ± 2.90 . It was found that 65.7% ($n=161$) of the participants tended toward anxiety; 38.4% ($n=94$) tended toward depression. While the participants' worst pain in the last 24 h was at a level of 4.62 ± 2.48 , the least level of pain stood at 2.18 ± 1.76 . The area of life which was most affected by their pain in the last 24 h was routine work (in and outside of the house), the ability to walk, and their level of general activity. The mean percentage of pain relief the participants had pain therapy in the last 24 h was 60.20 ± 23.45 percent and the analgesics most resorted to in the departments was nonsteroidal anti-inflammatory drugs and opioid drugs were among the drugs least administered. A statistically significant difference was found between gender and the mean scores anxiety and of pain and the subscales of the pain scale (general activity, emotional state, ability to walk and routine working level) ($p < 0.05$) (Table 2).

A statistically significant difference was observed in the comparison between the departments and the pain and comfort mean scores ($p < 0.05$). The highest level of pain was felt in the orthopedics department; the lowest level of pain was in the cardiothoracic department. When the departments and comfort levels were compared, the lowest level of comfort was found in the Otorhinolaryngology-Ophthalmology department while the highest level of comfort was in the cardiothoracic department. In the comparison of the departments and tendencies toward anxiety and depression, it was found that the patients in the cardiothoracic surgery department displayed the lowest scores in anxiety and the highest scores in depression. The department where the tendency toward anxiety was the highest was the

Table 1. Distribution by participants' sociodemographic and descriptive features (n=245)		
Variables		
Age	54.77±17.49	
Postoperative hospitalization (days)	3.46±1.59	
Duration of hospitalization (days)	6.31±4.70	
	Number (n)	Percentage (%)
Gender		
Female	114	46.5
Male	131	53.5
Education		
Literate	47	19.2
Elementary school	145	69.2
High school	34	13.9
University	19	7.8
Department		
General surgery	61	24.9
Orthopedics and traumatology	60	24.5
Cardiothoracic surgery	48	19.6
Neurosurgery	21	8.6
Otorhinolaryngology-ophthalmology	17	6.9
Urology	38	15.5
Surgical history		
Yes	163	66.5
No	82	33.5
Hospitalization history		
Yes	190	77.2
No	55	22.8
n: number.		

urology department. The department with the lowest tendency toward depression scores was the general surgery department ($p>0.05$) (Table 2).

There was a negative and weak correlation between the patients' ages and their tendency toward depression ($p<0.005$, $r=-0.238$). A positive and weak correlation was found between the patients' duration of hospitalization and their tendency toward depression ($p<0.001$, $r=0.238$). There was a negative and weak correlation between the postoperative hospitalization and pain ($p<0.005$, $r=-0.190$), a positive and weak correlation between postoperative hospitalization and the tendency toward anxiety ($p<0.05$, $r=0.141$), and a positive and weak correlation between postoperative hospitalization and the tendency toward depression ($p<0.05$, $r=0.160$) (Table 3).

A weak, negative correlation was found between the patients' anxiety and comfort levels ($p<0.001$, $r=-0.241$), while there was a weak but positive correlation between their anxiety and pain levels ($p<0.001$, $r=0.324$). Furthermore, a weak and negative correlation was found between comfort and pain levels ($p<0.001$, $r=-0.269$).

DISCUSSION

The result of the study was the finding that the patients' levels of pain were low and their comfort levels were good. It was determined that the tendency of patients to anxiety and depression was mild. Insufficient post-operative pain control reduces the comfort and satisfaction of patients.⁵ This can result in patients' tendency to anxiety and depression. We observed that the patients had tendencies toward both anxiety and depression. The stay in the hospital, chronic illnesses, and factors such as the inability to fulfill one's roles can lead surgical patients into anxiety and depression.²⁹ This is because surgical interventions are traumas that have a biological, psychological and social impact on the individual; they disrupt the integrity of the body, make individuals dependent and encompass the fear of the unknown.² In our study, the anxiety levels of the female patients were higher than the males and difference was statistically significant ($p<0.05$). This suggests that female patients are more affected because of interruptions in their gender-related roles brought about by the surgical process. Simultaneously, changes in perceptions of body image caused by surgical interventions may be another factor that raises anxiety levels among female patients.

Table 2. Comparison of patients' pain, comfort, anxiety and depression levels according to variables

Variables	Pain*	Comfort	Anxiety	Depression
X ± SD	3.46±1.71	4.27±0.59	10.64±3.59	8.51±2.90
Gender				
Female	3.80±1.77	4.24±0.57	11.14±3.76	8.80±2.75
Male	3.17±1.61	4.29±0.62	10.22±3.39	8.25±3.01
p-value	0.004	0.502	0.046	0.139
t	-2.916	0.672	-1.994	-1.474
Surgical history				
Yes	3.61±1.80	4.28±0.56	10.78±3.64	8.53±2.74
No	3.18±1.48	4.25±0.66	10.37±3.50	8.47±3.21
p-value	0.048	0.701	0.398	0.883
t	1.987	0.385	0.847	0.147
Hospitalization history				
Yes	3.50±1.76	4.23±0.58	10.84±3.55	8.62±2.77
No	3.37±1.55	4.39±0.64	9.92±3.71	8.05±3.71
p-value	0.602	0.120	0.097	0.203
t	0.583	-1.573	1.666	1.276
Departments				
General surgery	3.32±0.22	4.41±0.06	10.62±3.92	7.86±3.09
Orthopedics	4.13±0.20	4.16±0.07	11.06±3.39	8.43±2.87
Cardiothoracic surgery	3.06±0.24	4.46±0.08	9.58±3.49	9.14±2.45
Neurosurgery	3.09±0.19	3.89±0.12	9.85±2.39	8.66±2.70
Otorhinolaryngology-ophthalmology	3.58±0.42	3.97±0.13	11.05±4.17	8.52±3.42
Urology	3.31±0.31	4.32±0.11	11.63±3.52	8.78±3.00
p-value	0.018	0.000	0.103	0.336
F	2.793	4.959	1.855	1.147

*Average pain in the last 24 hours, SD: standard deviation.

Significant values are shown in bold.

An effective assessment and correct management of postoperative pain is important in preventing complications and increasing comfort levels.¹³ Our study indicated that the mean pain score of the patients in the last 24 h was at a low level. Studies in the literature report different results for the pain levels of surgical patients as there are many influencing factors.^{6,7,13} It has been found that most patients experience moderate to severe pain postoperatively.^{3,6,7} We found in our study that pain levels of women were significantly higher than men and that individuals with a surgical history had significantly higher pain levels than those that did not ($p < 0.05$). Acar et al.⁴ too have reported that women's pain levels are higher than men's. There is no clear distinction in the literature about the reasons for the differences in the perception of pain by men and women. However, it has been asserted that the higher level of complaints of pain among women compared to men is related to satisfaction.³⁰ Gender roles can also affect reactions toward pain,³¹ and normal hormone fluctuations in women, it is reported, can increase sensitivity toward pain.³² If effective pain control is achieved, it is suggested, the individual's tolerance

of future pain increases.³³ It was found in our study that levels of pain varied depending upon the department and that the pain levels of patients in the orthopedics department were significantly higher than in the other clinics ($p < 0.05$). Çavdar and Akyüz¹⁸ too have reported high levels of pain among patients after orthopedics, cardiothoracic and upper gastrointestinal surgery. In a study by Murray and Retief³⁴, it was reported that the incidence of pain in those undergoing abdominal and lower extremity surgery is high. A study by Savcı and Bilik³⁵ with orthopedic patients reveals that postoperatively the participants had experienced the severest pain they had ever felt and that they had difficulty moving because of their pain. In our study as well, the areas in which patients felt the most pain in the last 24 h were in the ability to walk and their general levels of activity. It was determined that the majority of the patients recovered from pain with pain treatment. It was found that the medications most used for pain control are nonsteroidal anti-inflammatory analgesics (NSAIs) and weak opioid analgesics. Other studies have reported the postoperative use of mostly NSAIs for pain control at a considerably low rate (13%), with a minimum dose

Table 3. Correlation of patients' pain, comfort, anxiety and depression levels according to age, duration of hospitalization, postoperative hospitalization

Variables	Pain*	Comfort	Anxiety	Depression
Age				
p-value	0.151	0.085	0.881	0.002
r	-0.092	-0.110	0.010	-0.236
Duration of hospitalization				
p-value	0.010	0.162	0.168	0.000
r	-0.152	-0.901	-0.088	0.238
Postoperative hospitalization				
p-value	0.003	0.406	0.028	0.012
r	-0.190	0.053	0.141	0.160
*Average pain in the last 24 hours. Significant values are shown in bold.				

of opioids. The use of a multimodal method was recorded as only 13%.^{6,36} It was reported in another study as well that while NSAIDs were preferred for treating slight pain, the opioid group of drugs were used in moderate to severe pain.³⁷ Considering the most recent evidence, the combined administration of analgesics with a central and peripheral effect is recommended. In this context, it is reported further that a multimodal pain management approach specific to the surgical procedure would be appropriate in improving postoperative healing.³⁸ Although there have been developments in the physiology and control of pain, it is reported that sufficient levels of postoperative pain control have not been achieved. Uncontrolled postoperative pain can lead to sleep problems and physical dysfunction, adversely affecting the recovery of the patient. It may in fact delay discharge from the hospital and functional healing.^{9,10} Postoperative pain management requires a multidisciplinary team approach and encompasses defining and treating the pain as well as undertaking interventions for care.¹⁵

A patient's experiencing pain, being in the hospital and undergoing a surgical procedure are factors that have an adverse impact on comfort.^{11,13} In our study, we found that the mean comfort score of our participants was at a good level. Good levels of comfort have also been reported in studies that have assessed the comfort levels of patients undergoing various types of surgery.^{5,39} The most important factor impacting patients' expectations in their postoperative care is effective pain control, which in turn has a positive effect on their perception of comfort. In our study, we found that males had a higher level of comfort than females but the difference was not statistically significant ($p > 0.05$). Similar results have been indicated in the literature.^{26,39} The reason for the lower comfort level of female patients may stem from the higher levels of pain they were found to be experiencing.

It was observed in our study that there was no significant difference between the participants' comfort mean scores and

their surgical histories ($p < 0.05$). On the other hand, patients who did have previous surgical experiences were found to have higher comfort levels. Some studies have indicated positive, some have reported negative effects of surgical experience on comfort.^{26,39} This suggests that individuals that have had a positive experience with surgery will tend to better manage their surgical procedure and this will therefore have a positive impact on their perceived levels of comfort. The fact that we found a negative and significant correlation between the patient's age and the tendency toward depression may be associated with the individual's coping skills. However, a positive relationship was found between the patients' duration of hospitalization and their tendency toward depression. This result may have stemmed from the failure to quickly achieve the independence of the patient, which is one of the most important outcomes expected from healthcare. Additionally, a negative, significant correlation was found between the postoperative hospitalization and pain and a positive, significant correlation between anxiety and the tendency toward depression (Table 3). Our study furthermore indicated a negative correlation between comfort and pain levels. Studies reveal inverse correlations between the severity of pain and comfort levels.³⁹ Findings indicating that pain is the most important parameter reducing comfort in the physical sense are supported by the results of our own study.¹¹ It has also been found however that anxiety is a factor that increases feelings of pain while pain in turn increases anxiety. It has been asserted that individuals who are emotionally healthy feel moderate-severe pain to a lesser extent than emotionally unhealthy individuals. It has been reported that when there is anxiety, the increase in the secretion of endorphins also affects the perception of pain.¹⁸ In our study as well, we found a significant correlation between pain and anxiety. There was a negative, significant correlation between anxiety and comfort. In a study by Ören² in which the factors influencing levels of comfort and anxiety among patients who had undergone surgery were assessed, the author reported a negative and significant correlation between

comfort and anxiety. It has also been reported that anxiety is also an important factor that reduces a patient's psychospiritual comfort following surgery.^{11,25}

Limitations of the Study

This study has some limitations. The study sample comprised from two state hospital and was nonrandom; therefore, the findings are not generalizable to all patients.

CONCLUSION

As a result, it has been determined that the pain levels of patients undergoing surgical interventions are at good levels because of the approach to pain control developed in recent years. Although patients still display slight levels of anxiety and a tendency toward depression, comfort levels have been found to be good. The patient's surgical history, age and gender affect these parameters. In the nursing care given to surgical patients, the patient should be approached with a holistic outlook and all factors adversely affecting the patient's comfort (pain, anxiety, environmental conditions, etc.) should be well managed to support the healing period. The type of surgical procedure the patient has previously undergone and particularly the patient's individual qualities should be considered in pain management. It is important that in line with evidence-based practices, the right analgesics are administered and the level of pain is assessed at appropriate intervals with a valid assessment tool. We believe that achieving pain control will make a positive contribution to the state of a patient's anxiety, depression and comfort while nursing care.

MAIN POINTS

- Pain levels of patients undergoing surgical interventions are at good levels because of the approach to pain control.
- Although patients still display slight levels of anxiety and a tendency toward depression, comfort levels have been found to be good.
- A weak, negative correlation was found between the patients' anxiety and comfort levels while there was a weak but positive correlation between their anxiety and pain levels.
- A weak and negative correlation was found between comfort and pain levels.

ETHICS

Ethics Committee Approval: Ethics committee approval was obtained with the decision dated 2017 August 01, and the protocol number of GO 2017/50265 of the Pamukkale University Non-Invasive Clinical Researches Assessment Commission to conduct the research (decision no: 2017/50265, date: 01.08.2017).

Informed Consent: The participants in the study were informed about the research and their written consent was taken.

Peer-review: Externally-peer reviewed.

Authorship Contributions

Concept: K.K., A.S., Design: K.K., A.S., Supervision: K.K., Data Collection and/or Processing: A.S., K.K., F.K.H., Analysis and/or Interpretation: A.S., K.K., F.K.H., Literature Search: A.S., K.K., F.K.H., Writing: K.K., A.S., Critical Review: K.K., A.S.

DISCLOSURES

Conflict of Interest: The authors declare no conflict of interest.

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

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