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The effect of postoperative pain on comfort in patients undergoing abdominal surgery

Ganime Esra Soysal, Ebru Celebi

Department of Nursing, Faculty of Health Sciences, Bolu Abant Izzet Baysal University, Bolu, Turkey

ORCID of the author(s)

GES: https://orcid.org/0000-0002-8291-4310
EC: https://orcid.org/0000-0003-2874-7395

Corresponding Author
Ganime Esra Soysal
Bolu Abant Izzet Baysal University, Faculty of Health Sciences Department of Nursing, Gölköy Campus, Bolu, Turkey
E-mail: ganimeesrasoysal@gmail.com

Ethics Committee Approval
The study was approved by the Bolu Abant Izzet Baysal University Clinical Researches Ethics Committee (No: 2021/247, Date: October 26, 2021).
All procedures in this study involving human participants were performed in accordance with the 1964 Helsinki Declaration and its later amendments.

Conflict of Interest
No conflict of interest was declared by the authors.

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Abstract

Background/Aim: Postoperative pain management aims to reduce pain intensity and improve patient comfort. This study was conducted to investigate the effects of postoperative pain on the well-being of patients undergoing abdominal surgery.

Methods: This research was designed as a prospective, descriptive study. The study was conducted on 94 patients who underwent abdominal surgery in general surgery. Patients over 18 years of age, who volunteered to participate in the study and who did not need intensive care were included in the research. Postoperative pain and comfort levels of the patients were analyzed. Descriptive information from the patients was used in the first part of the study and the Perianesthesia Comfort Questionnaire (PCQ) was used in the second part. The visual pain scale (VAS) was used to assess pain.

Results: The mean age of the patients was 54.7 (15.7) years; 54.3% of the patients were male; 76.6% were smokers; and the mean body mass index was 29.3 (6.3). Half of the patients underwent open and half underwent laparoscopic surgery, with 90.4% receiving general anesthesia. Patients were hospitalized an average of 3.5 (3.3) days after surgery**.** Patient comfort was at a good level, according to the PCQ. Whether they received local or general anesthesia did not affect their PCQ scores; however, pain was less in patients who received local anesthesia. Fasting time before surgery did not affect mean PCQ scores, but patients who fasted longer before surgery reported less pain. There were no differences in patients' mean scores on the PCQ scale and pain scores. The correlation between the mean PCQ and pain scales showed no significant relationship (r=-0.073, *P*=0.485).

Conclusion: The absence of a significant correlation between the mean PCQ scale and the pain scale indicates no meaningful association between these variables.

Keywords: postoperative pain, patient comfort, surgery, pain management

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Introduction

Pain is commonly described as "an unpleasant sensory and emotional experience associated with or described as actual or potential tissue damage" [1]. Pain is subjective and is characterized by the fact that each individual learns early in life through injury that the experience is unpleasant and, therefore, inherently both emotional and sensory. The process of pain perception involves the detection of stimuli by peripheral sensory nerve endings (nociceptors), primarily the conversion of stimuli into electrical activity, and the transmission of these nociceptive signals to the central nervous system (CNS) via peripheral sensory nerves [2]. Acute pain emerges subsequent to tissue injury related to surgical procedures and is expected to diminish throughout the process of recovery. Typically, this transition spans a duration of approximately three months, after which the pain is categorized as either chronic or enduring. Pain represents a multi-faceted encounter that is individualized for every patient. Variations in the experience of pain are shaped by biological responses, psychological conditions and attributes, as well as social circumstances [3].

Postoperative pain requires a special approach to the procedure and needs adequate analgesia for postoperative rehabilitation and recovery [4]. This recognition has led to the development of initiatives aimed at providing procedure-specific, evidence-based recommendations for the management of pain after a wide range of surgical procedures.

A significant proportion of patients experience unwanted postoperative pain. The prevention and relief of such pain is the primary responsibility of healthcare professionals.

The use of multimodal (or "balanced") analgesia has demonstrated efficacy in postoperative pain control, and its effectiveness has been well established in clinical research.

This concept suggests that combinations of analgesics with different modes or ranges of action may improve analgesia, reduce the need for opioids, and thus reduce the adverse effects of opioids postoperatively [5].

Although objective measures of patient comfort in the perioperative period have not been fully defined in previous studies, pain, mobilization, and sleep quality are known to influence patient comfort [6]. Therefore, an assessment of pain intensity, functional effects, and side effects of treatment should be performed and recorded using consistent, valid, and reliable scales and instruments. In addition to an overall assessment of the effectiveness of acute pain management, there is a need for information on the relationship between postoperative pain management and patient comfort, depending on the surgical site and specific surgical procedures. In this context, our study was conducted to investigate the impact of postoperative pain on the well-being of patients undergoing abdominal surgery.

Materials and methods

This study was conducted as a prospective, descriptive study on patients who underwent abdominal surgery at a university hospital's general surgery department between November 2021 and November 2022.

Sample

The study population consisted of patients undergoing abdominal surgery in the general surgery department of a teaching and research hospital. Patients over 18 years of age, who volunteered to participate in the study and who did not need intensive care were included in the research. When calculated with the G*Power statistical software based on previous studies, the study was designed to include at least 85 patients with an effect size of 0.4, a margin of error of 0.05, and a confidence interval of 0.95. Ninety-four patients were included in the study.

Scales and measures

Postoperative pain and comfort levels of the patients were measured in the study. In the first part of the study, the descriptive information of the patients was used and in the second part, the Perianesthesia Comfort Questionnaire (PCQ), which was adapted into Turkish by Üstündağ and Aslan in 2010, was used [7]. Data for the PCQ were collected by the researcher in the patient's room on the first postoperative day through a personal interview. The visual pain scale (VAS) was used to assess pain.

Perianesthesia Comfort Questionnaire (PCQ)

Kolcaba devised a three-tiered taxonomic structure with four dimensions that encapsulate the fundamental theoretical elements of comfort. This structure serves as a reference to analyze a given scenario for comfort requirements and achieve the desired increase in comfort. The scale comprises 24 questions that investigate an individual's emotions and self-perception, reflecting the overall thought process pertaining to perianesthesia duration. Each statement in the survey is rated on a Likert scale of 1-6, ranging from "strongly disagree" to "strongly agree." The scale consists of positive and negative items presented in a mixed format. Consistent citation and footnote style were followed as per the style guide, and quotes were clearly marked to avoid any ambiguity. Of the 24 items, 12 were positive (1, 5, 6, 11, 14, 16, 18, 19, 20, 21, 23, 24) and 12 were negative (2, 3, 4, 7, 8, 9, 10, 12, 13, 15, 17, 22), with the negative items scored in reverse order. Technical term abbreviations were explained when first used. Accordingly, a high score (6 points) for positive items indicates high comfort, while a low score (1 point) indicates low comfort. Conversely for negative items, a low score (1 point) indicates high comfort, and a high score (6 points) indicates low comfort. When scoring the scale, the negative scores obtained were reverse coded and combined with the positive items. The highest total score possible on the scale was 144 and the lowest total score was 24. The average score was obtained by dividing the total score by the number of scale points and the result was given in a distribution from 1-6. A low score indicates poor comfort, and a high score indicates good comfort. Cronbach's alpha coefficient was found to be 0.83 [7]. In this study, Cronbach's alpha coefficient was 0.77.

Visual analogue scale (VAS)

VAS is a popular method for measuring pain in various clinical contexts [8]. Pain intensity was measured by self-assessment using VAS. During pain assessment, the investigator presents the scale to the patient. One end of the scale corresponds to no pain, while the other end represents the maximum imaginable pain. The patient then reports the intensity of the pain.

Ethical considerations

This study was conducted under an ethical approval (No: 2021/247, Date: October 26, 2021) granted by the Bolu Abant Izzet Baysal University Ethics Committee. The Research Permission Form required for the study was obtained from the institution where the study was conducted. Patients enrolled in the study were informed about the study and completed the voluntary informed consent form.

Statistical analysis

The data were then exported to a computer program. Numerical and percentage analyses were used, and comparisons of parametric data were made using t-test and ANOVA. For non-parametric data, the Mann-Whitney U and Kruskal-Wallis tests were used. *P*-values <0.05 were considered statistically significant.

Results

The study included 94 patients undergoing abdominal surgery at the Department of General Surgery. The mean age of these patients was 54.7 (15.7) years; mean BMI was 29.3 (6.3); mean fasting time (hours) was 18.5 (5.0); and the mean postoperative mobilization time (hours) was 9.6 (7.3). Patients underwent cholecystectomy, appendectomy, gastrectomy, ostomy; and distal pancreatectomy.

A total of 54.3% of the patients were male and 76.6% were smokers. Half of the patients underwent open and half laparoscopic surgery. Overall, 90.4% received general anesthesia and fasted for 18.5 (5.0) hours prior to surgery. Patients were mobilized 9.6 (7.3) hours after surgery (Table 1). Patients stayed in the hospital for a mean of 3.5 (3.3) days after surgery. The mean postoperative discharge rate was 5.4 (2.2). Pharmacological methods were used for postoperative pain management in all patients. Postoperative vital signs and pain were measured every 15 minutes for the first hour, then every half hour for two hours, and subsequently, every four hours for seven hours.

The highest total score that could be obtained on the scale was 144 and the lowest total score was 24. The average score was obtained by dividing the total score by the number of scale points and the result was given in a distribution from 1-6. A low score indicated poor comfort, and a high score indicated good comfort. When the total score was divided by the number of items, the result was 5.2 (0.4), indicating that the patient's comfort was at a good level (Table 2).

There was no significant difference between patients' age, BMI, type of surgery, and PCQ scale and pain. The type of anesthesia (local or general) did not affect mean PCQ scores, but pain was lower in patients who received local anesthesia. Fasting periods of at least seven hours before surgery were observed, and the duration of fasting had no effect on mean PCQ scores, although patients who fasted longer before surgery reported less pain. There were no differences in patients' mean PCQ scale and pain scores during postoperative hospitalization (Table 3).

The correlation between the mean PCQ scale and the pain scale showed that there was no significant relationship between the two variables (r=-0.073, *P*=0.485).

Table 1: Diagnostic information about patients

	n	%
Age		
≤30	8	8.5
31-40	12	12.8
41-50	15	16.0
51-60	20	21.3
>60	39	41.5
Gender		
Female	43	45.7
Male	51	54.3
BMI		
≤18.5	2	2.1
18.5-24.9	20	21.3
25-29.9	40	42.6
≥30	32	34.0
Type of surgery		
Open	47	50.0
Laparoscopy	47	50.0
Type of anesthesia		
General	85	90.4
Local	9	9.6
Fasting time(hour)		
0-12 hour	43	45.7
13-24 hour	41	43.6
≥25	10	10.6
Postoperative mobilization time(hour)		
0-6	28	29.8
7-12	51	54.2
>12	15	16.0
Discharge time(day)		
0-1	37	39.4
2	21	22.3
≥3	36	38.3
Smoking		
Yes	22	23.4
No	72	76.6

n: Number, %: Percentage

Table 2: PCQ scale analysis

	Mean	SD	Min	Max	Mean/24	Cronbach's alpha
PCQ	127.06	10.6	96	142	5.2	0.77

PCQ: Perianesthesia Comfort Questionnaire, SD: Standard deviation, Min: Minimum, Max: Maximum

Table 3: Comparative analysis of PCQ and pain

	PCQ Mean (SD)	Statistical analysis	Pain Mean (SD)	Statistical analysis
Age				
≤30	123.62 (10.8)	F= 1.929	5.8 (2.2)	F= 0.960
31-40	124.50 (11.4)	*P*=0.112	6.0 (1.6)	*P*=0.434
41-50	123.73 (11.9)		5.3 (1.7)	
51-60	125.70 (11.1)		5.8 (2.0)	
>60	130.9.1(9.1)		4.9 (2.6)	
Gender				
Female	124.67(11.9)	t= -2.023	5.6 (2.3)	t= 1.019
Male	129.07(9.1)	*P*=**0.046**	5.1 (2.1)	*P*=0.311
BMI				
≤18.5	114.0 (2.8)	F= 1.811	3.9 (0.1)	F= 0.364
18.5-24.9	130.40 (8.9)	*P*=0.151	5.3 (2.7)	*P*=0.779
25-29.9	126.05 (11.1)		5.3 (2.1)	
≥30	127.06 (10.6)		5.5 (2.0)	
Type of surgery				
Open	129.74 (8.7)	t= 2.499	5.4 (2.2)	t= 0.318
Laparoscopy	124.38 (11.8)	*P*=**0.014**	5.3 (2.2)	*P*=0.752
Type of anesthesia				
General	126.52 (10.7)	t: -1.500	5.5 (2.1)	t: -2.497
Local	132.11 (9.3)	*P*=0.137	3.6 (2.0)	*P*=**0.014**
Fasting time(hour)				
0-12 hour	12.08 (10.4)	F= 1.292	5.7 (2.0)	F= 3.323
13-24 hour	125.1 (11.3)	*P*=0.280	5.4 (2.2)	*P*=**0.040**
≥25	130.3 (8.4)		3.7 (2.2)	
Postoperative mobilization time(hour)				
0-6	127.5 (10.9)	F= 0.946	5.1 (2.5)	F= 0.317
7-12	125.9 (11.5)	*P*=0.392	5.5 (1.8)	*P*=0.729
>12	130.1(5.8)		5.4 (2.9)	
Discharge time(day)				
0-1	126 (12.1)	F= 1.789	5.3 (2.1)	F= 0.849
2	123.6 (10.1)	*P*=0.173	4.9 (2.3)	*P*=0.431
≥3	129.0 (9.0)		5.7 (2.2)	

PCQ: Perianesthesia Comfort Questionnaire, SD: Standard deviation

Discussion

Postoperative pain management remains a challenge. More than 80% of patients undergoing surgery report acute postoperative pain, while less than half report adequate postoperative pain relief [9]**.** It is well known that inadequate

postoperative pain control is associated with higher postoperative pain scores. Postoperative pain management aims not only to reduce pain intensity but also to improve patient comfort [10]. Uncontrolled acute postoperative pain is associated with increased morbidity, poorer quality of life, delayed recovery, longer duration of opioid use, and higher health care costs [11]. Women reported more anxiety than men, both before and after surgery. Studies show that women experience more anxiety than men before and after surgery [12]. It has been suggested that the lower levels of comfort and the increased anxiety in women may be due to the fact that they experience more pain than men.

According to a study by Chae et al [13], immediately after surgery, female patients had more severe pain and used more analgesics than male patients. However, in the recovery room, younger female patients used more analgesics than older patients. A systematic review found that women have a higher risk of developing severe pain after surgery, but gender differences appear to be of little clinical significance [14]. Theodoraki et al. [15] showed that there was no difference in postoperative pain between male and female patients undergoing abdominal surgery. In our study, although pain was higher in women than in men, there was no statistically significant difference between genders.

In a study by Tighe et al. [16], older patients reported lower postoperative pain scores. Van Dijk et al. [17] showed that postoperative pain decreases with age.

The current study found that patients over 60 years old reported the least pain, which supports these studies, but there was no statistically significant difference between age groups. However, there was a negative correlation between pain scores and age. It has been suggested that the cause of these findings may be the effects of pharmacokinetic or pharmacodynamic changes with age.

BMI is an independent risk factor for postoperative pain [18] and it has been reported that high or low BMI has no effect on surgical pain [19]. However, Bolat et al. [20] reported that patients with a low BMI experienced more pain during prostate biopsy. In this study, BMI was not found to influence the postoperative course.

Epidural analgesia provides strong and effective analgesia [10]. Good induction of anesthesia appears to significantly reduce postoperative opioid consumption and improve patient comfort [21].

In open and laparoscopic abdominal surgery, the main cause of postoperative discomfort occurs six hours after surgery [22]. Recent minimally invasive techniques reduce both postoperative pain and patient comfort [23]. Studies show that patients undergoing laparoscopic surgery report less postoperative pain than patients undergoing open surgery [24]. Our study found that patients who underwent laparoscopy had less pain, but this did not affect patient comfort.

In a study by Liang et al [25], patients in the control group fasted for 12 hours and were water deprived for six hours before surgery, while patients in the research group fasted for six hours and were water deprived for two hours. It was found that the patients in the research group had less hunger and thirst and felt more comfortable in the preoperative period, and their postoperative pain was less than that of the control group. In the current study all patients had a fasting time of more than eight hours. There was no difference between fasting time and patient comfort. It was found that the longer the fasting period, the less pain was experienced. Considering the gate control theory, it could be that the state of starvation has an effect on pain, for example, by diverting attention. However, as prolonged fasting delays recovery, it is likely to have a longer-term negative effect on pain and patient well-being.

Restriction of movement during abdominal surgery is also a cause of significant discomfort. In addition, abdominal distension also increases postoperative discomfort [22].

Early mobilization can reduce patient pain, improve comfort, and increase satisfaction [26]. Early mobilization is reported to be necessary to reduce postoperative pain [27]. In our study, mobilization time was found to have no statistical effect on patient pain and comfort, which may be due to patients not having the necessary knowledge for early mobilization.

The correlation between the PCQ and the mean pain score showed that there was no significant relationship between the two variables; however, we cannot take into account the effect of other parameters affecting comfort on this relationship.

Limitations

Since this was a prospective, descriptive study, some parameters such as sleep, which may affect patients' postoperative pain and comfort, could not be determined.

Conclusion

Many patients experience pain after surgical procedures. It is very important to maintain effective pain management of patients and holistic patient care in the perioperative period. Many parameters can affect patient comfort along with pain. According to the findings of this study, postoperative pain levels may vary by gender, with female patients reporting lower levels of comfort than their male counterparts, particularly after abdominal surgery. In addition, patients who received general anesthesia were more prone to experiencing severe postoperative pain compared to those who received local anesthesia. However, no direct relationship was found between pain and patient comfort.

In light of these results, in order for patients to return to their daily activities in a short time, it is recommended to perform comparative clinical studies that may affect patient comfort and postoperative recovery quality, such as advanced analgesic technique, preoperative sleep, etc. Such research will provide a more comprehensive understanding of the complex link between postoperative pain and comfort, which will lead to improved postoperative care.

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