

## Original Article

# The Effect of Brochure Based Training on Anxiety, Pain, and Life Findings for Patients Undergoing Laparoscopic Cholecystectomy: A Quasi-Experimental Study

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### Abstract

**Purpose:** Today many surgical operations are performed with laparoscopic methods. This study was performed to investigate the effect of the brochure-based training on pain, anxiety, and life findings in patients undergoing laparoscopic cholecystectomy.

**Materials and methods:** This is a quasi-experimental controlled study. The data were collected from all patients who underwent laparoscopic cholecystectomy between 1 May 2018 and 30 December 2018, A State Hospital. When the confidence interval was calculated as 95% in the known sample universe, the number of patients to be included in the study was 62. The patients were divided into two groups as control (n = 31) and experiment (n = 31) groups. Patients were selected by random sampling method. The groups were homogenous. The data were collected by face-to-face interview method by the researcher using the patient identification form, the Hospital Anxiety, and Depression Scale, the Visual Analog Scale, and the evaluation of life findings. Patients who had laparoscopic cholecystectomy in the experimental group were given brochure training. The control group received routine nursing practice, and both groups were given a brochure booklet after making them fill in the forms 24 hours before and after the operation. Data were analyzed with SPSS 22 software package by employing Chi-square and t-test.

**Results:** There was a statistically significant difference in the anxiety levels of the patients in the hospital anxiety/depression scale ( $p < 0.05$ ), but there was no statistically significant difference in depression ( $p > 0.05$ ). Pain values were statistically significant ( $p < 0.05$ ) and there were mild positive results in vital signs.

**Conclusion:** We recommend that the training programs should be planned for patients and health care workers to reduce the anxiety levels before and after surgery, together with the training on non-pharmacological methods for reducing the pain levels in the patients undergoing laparoscopic cholecystectomy.

**Keywords:** Pain, Anxiety, Brochure-based training, Laparoscopic cholecystectomy.

### Introduction

The use of invasive procedures in surgical methods has decreased day by day. Surgeons are in contact with patients less and technological devices are used more (Wakabayashi et al., 2018; Cawich and Kabiye, 2019). Surgeons have started to use the laparoscopic surgical technique with 2-3 very small incisions, especially to minimize trauma-related scarring (Wakabayashi et al., 2018). Cholecystectomy is only one of the

operations that economically impose a surgical burden on hospitals (Ansaloni et al., 2016). In developing countries, gallstones are more common in 10% to 40% of adult patients and women (Everhart et al. 1999). A study showed that 10.3% of cholelithiasis is a very common surgical disease (Aykas and Karasu, 2018). In addition, laparoscopic surgery technique is preferred because it shortens the hospital stay of patients, reduces the cost to the health sector and the patient, and increases

patient satisfaction (Catav, 2011; Ali et al., 2014; Lemos et al., 2019).

Pain is one of the situations which are experienced most by patients after surgical operations. It is reported in recent studies that laparoscopic cholecystectomy gives less pain to patients than open cholecystectomy (Cankaya, 2018). Postoperative pain occurs in the surgical incision site. However, it causes the patients to experience stress due to the pain and the patients experience more pain due to this stress (Wongkietkachorn, Wongkietkachorn and Rhunsiri, 2018; Socea et al., 2020). Healthcare staff prefers pharmacological methods more in pain management as they are more effective than non-pharmacological methods. Some of the reasons for this preference are as follows; "the pharmacological methods are more effective than non-pharmacological methods, the ways of administering drugs are easy, these applications take less time and the medicines shows their effect faster" (Esmat and Kassim, 2016; Mavridou et al., 2017; Erdogan et al., 2020). However, non-pharmacological methods can also be used in pain management. These are; practices such as "hot-cold application, distraction, deep breathing and coughing exercises, meditation and listening to music" (Gabriel et al., 2019).

It was observed that patients with high levels of stress and anxiety before laparoscopic cholecystectomy experienced more pain after surgery, and medical complications (such as blood pressure and blood sugar) increased and lengthened hospital stay (Best et al., 2018; Erturk and Unlu, 2018). After laparoscopic cholecystectomy, many factors affect the healing process, especially fatigue, weakness, nausea-vomiting, and pain. These factors also negatively affect vital signs (blood pressure, pulse, satiety and fever) (Cankaya, 2018).

Postoperative uncontrollable pain and opioid medicines used can trigger nausea and vomiting. This, in turn, negatively affects the increase in blood pressure, respiratory rate, heart rate, and oxygenation of cells (Udayamala et al., 2016; Thong et al., 2018). Preoperative and postoperative anxiety may occur in patients with laparoscopic cholecystectomy (Baş et al., 2016; Wongkietkachorn, Wongkietkachorn and Rhunsiri, 2018). In patients with laparoscopic

cholecystectomy surgery, it can be said that there is no drain in the incision area after discharge and the operation with small incisions has advantages such as less pain, decrease in anxiety level, acceleration in the recovery process, and better cosmetic results (Bartnicka, Zietkiewicz and Kowalski, 2018).

Education and consultancy services should be provided to reduce the pain levels of patients and to keep their vital signs stable (De Aguilar-Nascimento et al., 2014; Best et al., 2018). The followings were provided in the brochure training and consultancy services given to patients about laparoscopic cholecystectomy surgery: providing general information about the surgery, teaching how to do exercises that will ensure less postoperative pain, planning home care to reduce anxiety and stress levels, planning nutrition for the first month after surgery, (Thong et al., 2018).

Early mobilization can reduce the pain development and anxiety levels in patients, and their nausea and vomiting can be controlled. Moreover, it can reduce and fatigue, regulate blood pressure, respiratory rate, pulse, and improve the quality of life by providing a positive effect on vital signs and oxygen saturation (Best et al., 2018; Xu, Wang and Yang, 2020). This study was conducted to examine the effect of brochure-supported education and one-to-one counseling on patients undergoing laparoscopic cholecystectomy on anxiety, pain, and vital signs.

**Material and Method:** This research was carried out at a State Hospital, 1 May 2018 and 30 December 2018. Population and Sample in this research, the patients were included in the experiment and control groups by considering their demographical characteristics to provide homogeneity.

**Research Design:** This is a quasi-experimental controlled study.

**Setting:** This research was carried out in A State Hospital, Surgery Service in the Republic of Turkey between 1 May 2018 and 30 December 2018.

**Population and Sample:** In this research, the patients were included in the experiment and control groups by considering their demographical characteristics to provide homogeneity. The number of patients who

applied to the hospital for the surgery ward was 72. When the confidence interval is calculated as 95% in the sample population of which is known, the number of patients to be included in this study was found as 62 (When the margin of error was calculated according to this formula, the confidence interval and percentage was taken as 95% and 2.15 margin of error was found as a result). Of 62 patients who were taken in the sample of this study, 31 were taken in the control group and 31 were taken in the experimental group. The sample of the study consisted of patients aged between 18 and 65 who were admitted to a State Hospital, Surgery service. These patients did not have verbal communication problems before and after the surgery and they did not have diagnosed with any mental health problems and additional chronic diseases.

**Data Collection:** All data were collected through the face-to-face interview method by the researcher (MD). Data collection tools were completed in the patient's room within 20-25 minutes. Brochure-supported training was given to the experiment group in the patient's room for over 45 minutes.

#### **Data collection tools**

**Consent form for experimental and control groups:** This is the consent form that was developed by the researcher (MD) based on the literature.

**Patient description form:** This form was developed by the researcher (MD) by doing an appropriate literature review. This form consisted of 12 questions in total, 7 of which were about socio-demographic characteristics (age, gender, marital status, educational background, place of residence, working status) and 5 of which were about the patient's diagnosis and treatment (whether he/she has a chronic disease, the medication he/she uses, the existence of genetic gallbladder stone in the family, body mass index of the patient, fatty food consumption).

**Hospital Anxiety Depression Scale (HADS):** This scale consisted of 14 questions to determine and measure anxiety and depression risk of the patients who had physical diseases and who applied to primary healthcare services. The odd-numbered questions measured anxiety and even-numbered questions measured depression. This scale provided four Likert-type

measurements and this was filled in by the participants. Each item's scoring was different and it was in the type of 3, 2, 1, 0; the items of 1, 3, 5, 6, 8, 10, 11, and 13 were gradually decreasing and were showing the severity of the disease. The validity and reliability of the scale were conducted by Omer Aydemir et al., in Turkey and the Cronbach alpha coefficient cut-off score was found as 10/11 (0.8525) for the sub-dimension of anxiety, and as 7/8 (0.7784) for the sub-dimension of depression. The patients whose scores were higher than these values were considered as under risk (Aydemir et al., 1997).

**Evaluation form of vital signs:** This form was developed by the researcher (MD). It is the form that would be used to determine the preoperative and postoperative vital signs of the patients, 8 hours after the surgery, 16 hours after the surgery, and 24 hours after the surgery. The form includes the following statements: Pulse was checked with the pulse-oximeter device; blood pressure was measured with a tonometer; the number of breathing was counted and its deepness was evaluated; the temperature was measured with a thermometer, and saturation was checked with the pulse-oximeter device.

**Pain evaluation form:** The researcher (MD) used the Visual Analogue Scale (VAS) in which there are facial expressions to evaluate the patient's pain. The VAS form consists of a line of 10 cm (or 100 mm) which is drawn in the vertical and horizontal axis. At one end of this line "no pain" is written and at the other end of this line "the worst imaginable pain" is written (Thong et al., 2018).

**Data analysis:** Data were analyzed with SPSS 22 software package by employing Chi-square and t-test.

**Ethical approval:** Ethical approvals were obtained from Sanko University Clinical Research Ethics Committee (Date: 29.03.2018, Session Number: 2018/02) and Mardin Provincial Directorate of Health (Date: 25.05.2018 / Number: 97039072-713.99). All the participant were treated in accordance to the Declaration of Helsinki.

#### **Results**

The mean age of the participants in this research study was 40,8±10,8 (min: 21 - max: 63). It was seen that the distributions of the

participants in the experiment and control groups in terms of gender, marital status, educational background, economic status, and working status were close to each other ( $p>0,05$ ). It was found that 69.4% (43) of the participants were living in urban areas. It was observed that none of the patients who were included in this research had chronic diseases and used any medications perpetually ( $p<0,05$ ). When the existence of genetic gallbladder stones in the family was considered, it was seen that 64.5% (40) of them did not have it. It was found that there was a similarity between the distributions of the participants in the experiment and control groups in terms of the existence of gallbladder stones in the family ( $p>0,05$ ). In terms of the Body Mass Index (BMI) of the participants, it was determined that a BMI of 53.2% (33) patients were between 25 and 29.9. It was observed that the distributions of the participants in the experiment and control groups in terms of the variable of BMI were close to each other ( $p>0,05$ ). When the distributions between the groups were considered, it was observed that the patients in the experiment group had higher tail fat responses than those in the control group and that there were statistically significant differences between them ( $p<0.05$ ).

It was seen that there were statistically significant differences between the anxiety levels of the participants. Anxiety levels of the patients in the control group were found to be higher than the patients in the experimental group ( $p=0.021$ ,  $p<0.05$ ). When the anxiety level after the surgery was considered, it was found that the anxiety levels of the patients in the experimental group were lower than the anxiety levels of the patients in the control group, and there were statistically significant differences between them ( $p=0.013$ ,  $p<0.05$ ) (Table 2).

In this research, it was found that preoperative VAS pain levels of the patients in the experimental and control groups were close to each other, but a statistically significant difference between the VAS pain levels at 24 hours after the surgery was observed ( $p<0.05$ ). It was determined that the pain scores of the patients in the control group were lower than of the patients in the experimental group and there were

statistically significant differences between them in the preoperative pain scores ( $p=0.003$ ,  $p<0.05$ ). When the results of after the surgery pain scores showed that the percentage of the patients in the control group who responded that "I have lots of pain" (7-8) was higher than the percentage of the patients in the experimental group, and there were statistically significant differences between them ( $p=0.001$ ,  $p<0.05$ ) (Table 3).

It was determined in the preoperative measurements of the patients in the experimental and control groups; when fever ( $p=0.019$ ) and saturation ( $p=0.006$ ) levels were taken into consideration, the arithmetic average of the patients in the control group was higher than of the patients in the experimental group and there were statistically significant differences between them ( $p<0.05$ ). The postoperative measurements of the patients revealed that the arithmetic average of blood pressure ( $p=0.001$ ), respiration ( $p=0.043$ ), and saturation ( $p=0.008$ ) levels of the patients in the control group was higher than that of the patients in the experimental group and there were statistically significant differences between them ( $p<0.05$ ). The measurements which were made 8 hours after the surgery showed that the arithmetic average of blood pressure ( $p=0.014$ ) and pulse ( $p=0.024$ ) levels of the patients in the control group was higher than that of the patients in the experimental group and there were statistically significant differences between them ( $p<0.05$ ). In the measurements of the patients 16 hours after the surgery, the arithmetic average of blood pressure ( $p=0.006$ ) and respiratory ( $p=0.041$ ) levels of patients in the control group was higher than of the patients in the experimental group. Also, the saturation ( $p=0.021$ ) of patients in the experimental group was higher in the patients in the control group and there were statistically significant differences between them ( $p<0.05$ ). In the measurements which were made 24 hours after the surgery, the arithmetic average of blood pressure of the patients was higher in the patients in the control group than the patients in the experimental group ( $p=0.012$ ,  $p<0.05$ ).

Spearman correlation coefficients of blood pressure ( $r = 0.725$ ), pulse ( $r = 0.775$ ), respiration ( $r = 0.785$ ) were observed to be a

moderately correlated ( $p < 0.01$ ). It was found that Spearman Correlation coefficients of fever ( $r = 0,367$ ) and preoperative VAS values had a weak positive correlation ( $p < 0.05$ ). The correlation findings of the fever, saturation, and depression results were not statistically significant in the preoperative vital findings of the control group ( $p > 0.05$ ). Spearman correlation coefficients of blood pressure ( $r = 0.620$ ), pulse ( $r = 0.664$ ), respiration ( $r = 0.633$ ) were observed to be a moderately positive correlation ( $P < 0.01$ ). It was determined that there was a negative correlation of anxiety value ( $p < 0.05$ ). A positive correlation was found in the VAS value ( $p < 0.05$ ) (Table 5).

Spearman correlation coefficients of blood pressure ( $r = 0.635$ ), pulse ( $r = 0.690$ ), respiration ( $r = 0.565$ ) were observed to have a moderate correlation ( $p < 0.01$ ). A weak negative correlation was observed in the anxiety value, whereas a weak positive correlation was found in the VAS value ( $p < 0.05$ ). It was observed that Spearman Correlation coefficients of blood pressure ( $r = 0.552$ ) value had a moderate positive correlation ( $p < 0.01$ ). A positive moderate correlation was observed in the respiratory ( $r = 0.459$ ) and VAS ( $r = 0.272$ ) values, whereas there was a weak negative correlation in the anxiety ( $r = - 0.362$ ) values ( $p < 0.05$ ) (Table 6).

**Table 1. Descriptive Characteristics of Patients in The Experimental and Control Groups**

| Descriptive characteristics | Experimental<br>(n: 31)      |     | Control<br>(n: 31)   |     | Total<br>(n: 62)     |     | p*                |         |
|-----------------------------|------------------------------|-----|----------------------|-----|----------------------|-----|-------------------|---------|
|                             | (n)                          | (%) | (n)                  | (%) | (n)                  | (%) |                   |         |
| Age (mean + sd) (min-max)   | 39.7±11.0<br>(21-63)         |     | 41.9±10.6<br>(23-61) |     | 40.8±10.8<br>(21-63) |     | p=0.423<br>p>0.05 |         |
| Sex                         | Female                       | 27  | 87.1                 | 22  | 71                   | 49  | 21.0              | p=0.106 |
|                             | Male                         | 4   | 12.9                 | 9   | 29                   | 13  | 79.0              | p>0.05  |
| Marital status              | Single                       | 5   | 16.1                 | 2   | 6.5                  | 7   | 11.3              | p=0.212 |
|                             | Married                      | 26  | 83.9                 | 29  | 93.5                 | 55  | 88.7              | p>0.05  |
| Education status            | Literate                     | 12  | 38.7                 | 12  | 38.7                 | 24  | 38.7              |         |
|                             | Primary school               | 12  | 38.7                 | 9   | 29.0                 | 21  | 33.9              | p=0.790 |
|                             | High school                  | 6   | 19.4                 | 8   | 25.8                 | 14  | 22.6              | p>0.05  |
| Economic status             | Higher education             | 1   | 3.2                  | 2   | 6.5                  | 3   | 4.8               |         |
|                             | Income Less than the expense | 21  | 67.7                 | 21  | 67.7                 | 42  | 67.7              |         |
|                             | Income equals expense        | 9   | 29.0                 | 10  | 32.3                 | 19  | 30.6              | p=0.591 |
|                             | Income More than the expense | 1   | 3.2                  | 0   | 0.0                  | 1   | 1.6               | p>0.05  |
| Working status              | Officer                      | 1   | 3.2                  | 0   | 0.0                  | 1   | 1.6               | p=0.095 |
|                             | Housewife                    | 25  | 80.6                 | 19  | 61.3                 | 44  | 71.0              | p>0.05  |



|                                    |                 |    |       |    |       |    |       |                          |
|------------------------------------|-----------------|----|-------|----|-------|----|-------|--------------------------|
|                                    | Self-employment | 5  | 16.1  | 12 | 38.7  | 17 | 27.4  |                          |
| <b>Place of residence</b>          | Urban area      | 25 | 80.6  | 18 | 58.1  | 43 | 69.4  | <b>p=0.049</b><br>p>0.05 |
|                                    | Rural area      | 6  | 19.4  | 13 | 41.9  | 19 | 30.6  |                          |
| <b>Presence of chronic illness</b> | No              | 31 | 100.0 | 31 | 100.0 | 62 | 100.0 | p=1.000<br>p>0.05        |
|                                    | Yes             |    |       |    |       |    |       |                          |
| <b>Continuous medication use</b>   | No              | 31 | 100.0 | 31 | 100.0 | 62 | 100.0 | p=1.000<br>p>0.05        |
|                                    | Yes             |    |       |    |       |    |       |                          |

\* p&lt;0.05

**Table 2. The Hospital Anxiety and Depression Scale Before and After the Surgery**

| Measurements                    | Experimental group (n: 31)     |    | Control group (n: 31) |    | X <sup>2</sup> / p* |   |
|---------------------------------|--------------------------------|----|-----------------------|----|---------------------|---|
|                                 | n                              | %  | n                     | %  |                     |   |
| Anxiety level before surgery    | 7 and under (Not patient)      | 13 | 42.0                  | 10 | 32.3                | <b>X<sup>2</sup>=10.754</b><br><b>p=0.021</b> |
|                                 | 8 – 10 (Patient at the border) | 9  | 29.0                  | 11 | 35.4                |   |
|                                 | 11 and above (Patient)         | 9  | 29.0                  | 10 | 32.3                |   |
| Anxiety level after surgery     | 7 and under (Not patient)      | 17 | 54.8                  | 12 | 38.7                | <b>X<sup>2</sup>=38.363</b><br><b>p=0.013</b> |
|                                 | 8 – 10 (Patient at the border) | 9  | 29.0                  | 6  | 19.3                |   |
|                                 | 11 and above (Patient)         | 5  | 16.2                  | 13 | 42.0                |   |
| Depression level before surgery | 7 and under (Not patient)      | 18 | 58.1                  | 17 | 54.8                | X <sup>2</sup> =0.087<br>p=0.957              |
|                                 | 8 – 10 (Patient at the border) | 8  | 25.8                  | 9  | 29.0                |   |
|                                 | 11 and above (Patient)         | 5  | 16.1                  | 5  | 16.1                |   |
| Depression level after surgery  | 7 and under (Not patient)      | 18 | 58.1                  | 19 | 61.3                | X <sup>2</sup> =0.388<br>p=0.824              |
|                                 | 8 – 10 (Patient at the border) | 9  | 29.0                  | 7  | 22.6                |   |
|                                 | 11 and above (Patient)         | 4  | 12.9                  | 5  | 16.1                |   |

\* p&lt;0.05

**Table 3. Preoperative and Postoperative Pain Scores of the Patients**

| Measurements of pain scores before surgery |   | Experimental group (n: 31) |       | Control group (n: 31) |       | Total patient group (n: 62) |       | X <sup>2</sup> / p*               |
|--|---|----------------------------|-------|-----------------------|-------|-----------------------------|-------|-----------------------------------|
|  |   | (n)                        | (%)   | (n)                   | (%)   | (n)                         | (%)   |                                   |
| Pain score                                 | Very happy (0)                                  | 6                          | 19.4  | 17                    | 54.8  | 23                          | 37.1  | X <sup>2</sup> =11.971<br>p=0.003 |
|  | Have very little pain (1-2)                     | 16                         | 51.6  | 13                    | 41.9  | 29                          | 46.8  |                                   |
|  | Have little pain (3-4)                          | 9                          | 29.0  | 1                     | 3.2   | 10                          | 16.1  |                                   |
|  | <b>Total</b>                                    | 31                         | 100.0 | 31                    | 100.0 | 62                          | 100.0 |                                   |
| Measurements of pain scores after surgery  |   | Experimental group (n: 31) |       | Control group (n: 31) |       | Total patient group (n: 62) |       | X <sup>2</sup> / p*               |
|  |   | (n)                        | (%)   | (n)                   | (%)   | (n)                         | (%)   |                                   |
| Pain score                                 | Have pain (5-6)                                 | 21                         | 67.7  | 8                     | 25.8  | 29                          | 46.8  | X <sup>2</sup> =13.113<br>p=0.001 |
|  | Have lots of pain (7-8)                         | 10                         | 32.3  | 18                    | 58.1  | 28                          | 45.2  |                                   |
|  | I've got more pain than you can imagine. (9-10) | 0                          | 0.0   | 5                     | 16.1  | 5                           | 8.1   |                                   |
|  | <b>Total</b>                                    | 31                         | 100.0 | 31                    | 100.0 | 62                          | 100.0 |                                   |

\* p&lt;0.05

**Table 4. Vital Signs of the Patients**

| Measurements                                |                | Experimental group (n: 31) | Control group (n: 31) | t      | p*           |
|---|----------------|----------------------------|-----------------------|--------|--------------|
|   |                | Ort±SD                     | Ort±SD                |        |              |
| Pre-surgical measures                       | Blood Pressure | 92.9±10.27                 | 94.9±10.56            | -0.780 | 0.438        |
|   | Pulse          | 85.7±6.23                  | 87.0±6.58             | -0.832 | 0.166        |
|   | Respiration    | 20.3±1.64                  | 20.9±1.61             | -1.402 | 0.409        |
|   | Fever          | 36.5±0.23                  | 36.6±0.14             | -2.416 | <b>0.019</b> |
| Measurements made immediately after surgery | Saturation     | 95.4±0.71                  | 96.0±1.03             | -2.857 | <b>0.006</b> |
|   | Blood Pressure | 72.3±4.44                  | 76.3±4.99             | -3.386 | <b>0.001</b> |
|   | Pulse          | 71.6±3.87                  | 73.4±3.89             | -1.894 | 0.063        |

|   |                |           |            |        |              |
|---|----------------|-----------|------------|--------|--------------|
|   | Respiration    | 16.3±0.80 | 16.9±1.13  | -2.066 | <b>0.043</b> |
|   | Fever          | 34.5±0.31 | 34.5±0.39  | -0.143 | 0.887        |
|   | Saturation     | 89.5±2.09 | 90.7±1.24  | -2.727 | <b>0.008</b> |
|   | Blood Pressure | 77.1±4.98 | 80.9±6.61  | -2.537 | <b>0.014</b> |
|   | Pulse          | 74.1±3.72 | 76.3±3.94  | -2.318 | <b>0.024</b> |
| <b>Measurements made 8 hours after surgery</b>  | Respiration    | 17.0±1.35 | 20.8±18.06 | -1.150 | 0.255        |
|   | Fever          | 35.8±0.18 | 35.7±0.32  | 1.907  | 0.061        |
|   | Saturation     | 93.7±1.07 | 93.6±0.98  | 0.370  | 0.713        |
|   | Blood Pressure | 80.8±5.09 | 85.2±6.88  | -2.873 | <b>0.006</b> |
|   | Pulse          | 76.0±3.55 | 78.0±3.72  | -2.092 | <b>0.041</b> |
| <b>Measurements made 16 hours after surgery</b> | Respiration    | 18.3±0.80 | 18.5±0.92  | -0.881 | 0.382        |
|   | Fever          | 36.3±0.13 | 36.2±0.17  | 1.739  | 0.087        |
|   | Saturation     | 95.3±0.84 | 94.8±0.96  | 2.376  | <b>0.021</b> |
|   | Blood Pressure | 84.7±5.29 | 89.1±7.94  | -2.576 | <b>0.012</b> |
|   | Pulse          | 77.8±3.32 | 77.0±13.67 | 0.294  | 0.770        |
| <b>Measurements made 24 hours after surgery</b> | Respiration    | 18.9±1.24 | 18.9±1.13  | 0.000  | 1.000        |
|   | Fever          | 36.5±0.18 | 36.5±0.13  | -0.389 | 0.699        |
|   | Saturation     | 96.5±0.85 | 95.6±0.90  | 3.897  | <b>0.001</b> |
|   |                |           |            |        |              |

\* p&lt;0.05

**Table 5. Investigation of The Relationship Between the Patients' Physiological Responses Before the Surgery HADS and VAS**

| Before Surgery | Anxiety            |              |               |              | VAS                |              |               |              |
|----------------|--------------------|--------------|---------------|--------------|--------------------|--------------|---------------|--------------|
|                | Experimental group |              | Control Group |              | Experimental group |              | Control Group |              |
|                | r                  | P            | r             | p            | r                  | p            | r             | p            |
| Blood Pressure | 0.725              | <b>0.000</b> | 0.620         | <b>0.000</b> | 0.725              | <b>0.000</b> | 0.620         | <b>0.000</b> |
| Pulse          | 0.775              | <b>0.000</b> | 0.664         | <b>0.000</b> | 0.775              | <b>0.000</b> | 0.664         | <b>0.000</b> |
| Respiration    | 0.785              | <b>0.000</b> | 0.633         | <b>0.000</b> | 0.785              | <b>0.000</b> | 0.633         | <b>0.000</b> |
| Fever          | 0.367              | <b>0.043</b> | 0.354         | 0.051        | 0.367              | <b>0.043</b> | 0.354         | 0.051        |
| Saturation     | 0.240              | 0.194        | 0.285         | 0.120        | 0.240              | 0.194        | 0.285         | 0.120        |



**Table 6. Investigation of The Relationship Between the Patients' Physiological Responses 24 Hours After the Surgery HADS and VAS**

| After Surgery  | Anxiety            |              |               |              | VAS                |              |               |              |
|----------------|--------------------|--------------|---------------|--------------|--------------------|--------------|---------------|--------------|
|                | Experimental group |              | Control Group |              | Experimental group |              | Control Group |              |
|                | r                  | p            | r             | p            | r                  | p            | r             | p            |
| Blood Pressure | 0.635              | <b>0.000</b> | 0.552         | <b>0.000</b> | 0.635              | <b>0.000</b> | 0.552         | <b>0.000</b> |
| Pulse          | 0.690              | <b>0.000</b> | 0.011         | 0.953        | 0.690              | <b>0.000</b> | 0.011         | 0.953        |
| Respiration    | 0.565              | <b>0.001</b> | 0.459         | <b>0.009</b> | 0.565              | <b>0.001</b> | 0.459         | <b>0.009</b> |
| Fever          | -0.006             | 0.973        | 0.174         | 0.350        | -0.006             | 0.973        | 0.174         | 0.350        |
| Saturation     | 0.325              | 0.074        | 0.227         | 0.218        | 0.325              | 0.074        | 0.227         | 0.218        |

## Discussion

Laparoscopic cholecystectomy surgery is a condition that requires surgical incision and creates anxiety in the patient (Best *et al.*, 2018). Therefore, planned preoperative patient training might reduce the anxiety of the patients (Yildiz *et al.*, 2015; Zarei *et al.*, 2018). In this study, the anxiety levels of the patients undergoing laparoscopic cholecystectomy were evaluated by giving pre-operative planned brochure training. The pre-operative anxiety level of the experimental group patients was 29%, while the preoperative anxiety level of the control group patients was 32.3%. A statistically significant difference was found between the postoperative anxiety scores of the experimental group patients who received training and the anxiety scores of the control group ( $p < 0.05$ ).

It was observed that the anxiety scores obtained in the study decreased with the education given before the surgery (Horn-Hofmann *et al.*, 2018; Togac and Yilmaz, 2020). Increasing the pre-operative stress and anxiety levels of the patients physiologically activates the sympathetic nervous system and may adversely affect blood pressure, pulse, and respiratory values (Garcia, 2014; Ali *et al.*, 2018). The education is given to the patients before surgery decreased the level of anxiety and positively affected the physiological responses (Togac and Yilmaz, 2020). Studies have shown that with less

surgical incision, patients experience less pain and have lower anxiety levels (14). When it is considered that the anxiety levels of the patients decreased by providing training in the experimental group, it can be expected that the pain scores getting lower (Yildiz *et al.*, 2015).

When the behaviors of the patients towards nutrition, early mobilization, medicines used, and deep breathing exercises were examined, it was seen that the patients in the experimental group performed more carefully and effectively than the patients in the control group (Mendes *et al.*, 2010). Also, this training enables patients to recover faster and to be discharged earlier (De Aguilar-Nascimento *et al.*, 2014; Wongkietkachorn, Wongkietkachorn and Rhunsiri, 2018).

In line with the findings of the study, it was determined that the brochure-supported education given to the experimental group reduced the anxiety level of the patients and positively affected the saturation level of the experimental group 24 hours after the operation. It was also found that the patients were mobilized earlier and exercised more effective breathing exercises (De Aguilar-Nascimento *et al.*, 2014; Garcia, 2014).

## Conclusion and Recommendations

In this study, one-to-one brochure-supported education given to the patients in the experimental group affected the patient care outcomes more positively than the control

group. Education programs and interventions to reduce pre-and postoperative anxiety/depression levels of patients undergoing surgery should be planned (such as online education, video, brochure). Healthcare professionals working in surgery clinics should support the education to be given to patients, make continuous reminders and take time to understand patients. Providing education by healthcare professionals to all patients hospitalized in the clinic, including general information about surgeries and pre and post-operative deep breathing and coughing exercises.

Non-pharmacological interventions should be planned to reduce the pain level of the patients undergoing surgical operations and it should be checked whether the patients are performing these interventions.

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