

**An-Najah National University
Faculty of Graduate Studies**

**Pre-operative anxiety correlation with
post-operative pain level and analgesia
consumption: A prospective cohort study**

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الإهداء

بسم الله الرحمن الرحيم

(وقل اعملوا فسيرى الله عملكم ورسوله والمؤمنون)

صدق الله العظيم

إلهي لا تطيب الليل إلا بشكرك ولا تطيب النهار إلا بطاعتك. ولا تطيب اللحظات إلا بذكرك..

ولا تطيب الآخرة إلا بعفوك.. ولا تطيب الجنة إلا برويتك

إلى من بلغ الرسالة وأدى الأمانة ونصح الأمة إلى نبي الرحمة ونور العالمين.

سيدنا محمد صلى الله عليه وسلم

إلى من كلفه الله بالعبية والوقار. إلى من علمني العطاء بدون انتظار. إلى من أحمل اسمه

بكل افتخار. أرجو من الله أن يمد في عمرك لئلا تماناً قد حان قطافها بعد طول انتظار

وستبقى كلماتك نجوم أهندي بها اليوم وفي الغد وإلى الأبد.

والدي العزيز

إلى ملاكي في الحياة.. إلى معنى الحب وإلى معنى الحنا والتفاني. إلى بسملة الحياة وسر

الوجود

إلى من كان دعائها سر نجاحي وحنانها بلسم جراحي إلى أغلى الحبايب

أمي الحبيبة

إلى من بها أكبر وعليه أعتمد. إلى شمعة متقدة تنير ظلمة حياتي.

إلى من بوجودها أكتسب قوة ومحبة لا حدود لها.

إلى من عرفت معها معنى الحياة

أختي

إلى أخي ورفيق دربي وهذه الحياة بدونك لا شيء معك أكون أنا وبدونك أكون مثل أي شيء.. في
نهاية مشواري أريد أن أشكر على مواقفك النبيلة إلى مع تطلعت لنجاحي بنظرات الأمل

أخي

إلى توأم روعي ورفيقة دربي.. إلى صاحبة القلب الطيب والنوايا الصادقة
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زوجتي

إلى الأخوة والأخوات الذين لم تلدهم أمي. إلى مع تحلو بالإخاء وتميزوا بالوفاء والعطاء
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إلى مع عرفت كيف أجدهم وعلموني ألا أضيعهم

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الإقرار

أنا الموقع أدناه مقدم الرسالة التي تحمل العنوان:

Pre-operative anxiety correlation with post-operative pain level and analgesia consumption: A prospective cohort study

مدى ارتباط التوتر قبل العملية الجراحية بمستوى الألم وكمية استهلاك المسكنات بعد العملية الجراحية: دراسة مستقبلية

أقر بأن ما اشتملت عليه هذه الرسالة إنما هو نتاج جهدي الخاص، باستثناء ما تمت الإشارة إليه حيث أن هذه الرسالة كاملة، أو أي جزء منها لم يقدم من قبل لنيل أي درجة أو لقب علمي أو بحث لدى أي مؤسسة تعليمية أو بحثية أخرى.

Declaration

The work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

Student's name:

اسم الطالب:

Signature:

التوقيع:

Date:

التاريخ:

Abbreviation

NSAID: The Non-Steroidal Anti Inflammatory Drugs

TENS: Transcutaneous Electrical Nerve Stimulation

APA: American Psychiatric Association

ASA: American anesthesiologist Association

VAS: Visual Analogue Scale

BAIs: Beck Anxiety Inventory scale

LC: Laparoscopic Cholecystectomy

IASP: International Association for the Study of Pain

STAI: State–Trait Anxiety Inventory

PSQ: Pain Sensitivity Survey

ANOVA: Analysis of Variance

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**Pre-operative anxiety correlation with post-operative pain level and
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Abstract

Introduction: In patients who are hospitalized for surgery, anxiety disorders are frequently observed. Anxiety affects the patient's postoperative pain level and may significantly increase the consumption of analgesia post-operatively.

Aim: The allover aim of this thesis is to identify and assess the relationship between preoperative anxiety and postoperative pain and its related factors. Also, to find the relationship between preoperative anxiety and post-operative Pethidine consumption among patients undergoing a laparoscopic cholecystectomy surgery .

Method: A Prospective cohort design was used in this study. A convenience sample of total 100 patients were enrolled who were undergoing a laparoscopic cholecystectomy. Demographic characteristics of the patients were recorded. Beck's Anxiety Inventory scale (BAIs) was administered to the patients. During the postoperative period, Pethidine was used for pain control. Visual Analog Scale (VAS) scores and Pethidine consumption of all patients were recorded. The setting of data collection was St. Joseph Hospital in Jerusalem district. The data was analyzed by SPSS (version 21).

The result: Out of total sample, 35% of participants are male while 65% are female. Fifty-five percent had school education level and 45% had university level. Regarding ASA, most of participants (74%) were ASA1. Participants mean level of pain was higher in the pre-operative period (mean VAS= 1.3) comparing with their mean level of pain in the post-operative period (mean VAS= 0.5). According to BAIs, the most common feelings among the participants were psychological in nature. There is a statistical significant difference between the participant's level of anxiety and post-operative pain level (p value < 0.001). Participants who had high level of pre-operative anxiety (BAIs ≥ 17) is tend to develop a higher level of post-operative pain level (VAS mean=7). Furthermore, there is a statistical significant difference between the participant's level of anxiety and post-operative Pethidine consumption (p value < 0.001). Participants who had a high level of pre-operative anxiety (BAIs ≥ 17) were predisposed to consumed a higher dose of post-operative Pethidine (mean=1.1mg/kg). Gender, weight, level of education, and smoking were predictors of developing pre-operative anxiety among participants. Also, gender, smoking, and medication were statistically significant predictors for developing post-operative pain. Furthermore, gender, medical history, and medication were statistically significant predictors for Pethidine consumption post-operatively.

Conclusion: Based on the analysis of the findings of the study, the following inferences were drawn. There was a significant relationship between preoperative anxiety with post-operative pain and post-operative

pethidine consumption among laparoscopic cholecystectomy patients. Thus, the relationship between anxiety and pain was supported. Therefore, pre-operative anxiety reduction intervention should be promoted as an institutional policy and implemented as a routine care for all surgical patients.

Key words: Anxiety, Cholecystectomy, Pain, Postoperative analgesia, VAS.

Chapter One

Introduction

Chapter One

Introduction

This chapter describes and gives an overview of the problem under investigation. It starts by the background of the study then aims and purpose, statement of the problem and significant of study, conceptual and operational terms of the study.

1.1 Background

World Health Organization (WHO) define being healthy is not only as the absence of disease and disability, its complete physical, social and mental state wellbeing. Inner environment of the individual organism is depending on the continuity of balance between psychological & physiological aspects.

Admission to the hospital is an anxious event for any individual and being extremely anxiety provoking especially in case of surgical patients, this may lead to cognitive, behavioral and physical complaint that resulting in negative effects on the recovery of the surgical patients (Theunissen, et al., 2012). In addition, pain post-operative consider as main cause of discomfort and interferes with postoperative recovery and mobilization of patients postoperative (Kil, et al., 2013). There is a reciprocal relationship between psychological aspect and pain. Therewith, the correlation by which anxiety and pain effect to each other is not completely clears (Geha, et al., 2009).

Anxiety feeling among patient resulted from the physical effects of the disease as well as from the environmental factor, which is being in hospital. The factors that can give rise to anxiety feeling for patients inside the hospital include the being away from family, fear of receiving of painful therapy, being away from job or losing job, being in stranger place, and be facing stranger devices and unknown procedures.

For surgical patients the anxiety may relate to these factors that considered as significant causes of anxiety (Mitchell, 2000; Yardakçi & Akyolcu, 2004). Operation itself, fear of invasive interventions and wound, intra operative anesthesia, postoperative pain, being dependent on other and need of help, and body image disturbances were factors which may considered as a threat. The patient's feels anxiety when they confront these types of threat (Kuğu, et al., 2009).

Most of individuals planed for elective surgery experienced anxiety that accepted as a predictable reaction. However, preoperative anxiety is a challenging for health care worker in dealing with the preoperative patients (Mitchell, 2011).

Anxiety is defined as a tension or unpleasant state of worry, which may be associated with abnormal individual hemodynamic state as a result of endocrine, sympathetic, and parasympathetic stimulation. It begins as soon as the operation is planned and increases gradually to maximum intensity at the time of admission to the hospital (Pokharel, et al., 2011).

Patients may consider the day of surgery as the greater and the most threatening moment experienced in their lives. The degree to which each patient manifests anxiety related to future experiences depends on many factors. These include type of the planned operation, gender, age of patient, history of hospitalization, history of surgical experience, and individual susceptibility in reaction to stressful events (Mitchell, 2011). Some degree of anxiety is normal and considered as a natural response to the unexpected threatening events that patients face in the preoperative period, especially for first hospital surgical experience. Also, the high preoperative anxiety patients need more postoperative analgesia, prolonged stay in hospital, significant poor patient satisfaction (Pokharel, et al., 2011).

Interventions to decrease preoperative anxiety may include relaxation procedures, supportive information, distraction attention focusing, and pharmacological therapy. Subjective assessment of preoperative anxiety is found to be inaccurate as both anesthetists and surgeons overestimate their patients' anxiety (Pokharel, et al., 2011).

Anxiety has many negative manifestations, and one of these manifestations is pain. Pain is an abstract concept and affects the life quality of the individual in a negative way by preventing the individual from carrying out daily activities. The degree or nature of pain can only be described by the individual affected by this state (Christensen, 2012).

Anxiety increases secretion of adrenaline, noradrenaline, and cortisol (Gürsoy, et al., 2016). This may to some extent increase in postoperative

pain, increased consumption of postoperative analgesics, prolonged hospital stay, and poor patient satisfaction (Jawaid, et al., 2007).

Pain is the main complaint of post-operative patients (Chen, 2016). Severity of postoperative pain is related to several factors one of these is the operation type (Hinkle, 2013). Pain is self and subjective experience, and preoperative anxiety is one of the most important factors that lead to postoperative pain. Acute anxiety and acute pain are usually seen with each other, with decreasing anxiety lead to reducing the severity of the pain. In a research carried out by Özalp, et al. (2014) on 99 female patients undergoing caesarian section, patients with preoperative high anxiety levels were found to experience more pain and to need more analgesics.

The experiences of pain are very personal. According to official the International Association for the Study of Pain, pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage (International association for the study of Pain 2012; Hinkle, 2013).

Sensation of pain feels when the tissues are damaged. When the tissues are damaged, automatically pain receptors get activated and start sending signals to the spinal cord through peripheral nerve. In the spinal cord, neurotransmitters get activated to give information to the thalamus where the information is sorted out to send throughout the body. Then the thalamus in the brain moves those pain signals to somatosensory cortex, which senses the feeling of pain. The pain can be either short term, acute or

chronic (Hinkle, 2013). Acute pain occurs when the tissues are damaged due to trauma, surgery or burns in which the duration of pain is short and healing does not require advance procedure on other hand, chronic pain need more advanced treatment to cure (Hinkle, 2013).

In general, there are certain factors which affect how a person experiences the pain that include emotions, any personal previous painful experiences, attitudes, gender, cultural and religious beliefs (Ali, et al., 2013).

Despite awareness of pain physiology and pain control practice, patients underwent operation are continuously experiencing a considerable level of pain post- operative (Lorentzen et al., 2012).

Intense anxiety experienced in the pre-operative period increases intensity of pain in the postoperative period and makes pain control difficult (Maheshwari& Ismail, 2015). As high levels of pain are associated with the anxiety and fear level of the patient, providing education is one of the most important strategies that can be used by the nurse for reducing postoperative pain (Shoaei, 2016). Research has demonstrated that anxiety level of the patient and his/her family, and the information required by each are compared. Anxieties of patients in general have been found to be associated with lack of information (Tovilović, 2009).

The delivery of enough pain control techniques considered as a base which investigations can be made on healthcare professionals are able to

provide patient satisfaction (Lorentzen, et al., 2012). When provide proper, correct, and effective pain management will increase the probability and ability of patients underwent surgery to recover quickly (Apfelbaum, et al., 2003). There is also evidence which proposed that inadequate or inappropriate management of pain that can manifested and lead to harmful complications to postoperative patients (Brunner et al., 2009; Carr et al., 2010). These harmful consequences include postponed wound healing, , atelectasis, more time in hospital, deep venous thrombosis, progression to chronic post-operative pain, and even death (Francis and Fitzpatrick, 2013; Marmo & Fowler, 2010; Wood, 2010). More over uncontrolled pain may cause more suffering, high level of anxiety, depression, fearing, and anger to the post-operative patients (Abdalrahim, 2009; Ferrell, 2005).

1.1.1 Pain management methods

Pharmacological methods

1. The non-steroidal inflammatory drugs (NSAID)

NSAID prescribed for patients in phase of acute pain, and mostly used as anti-inflammatory diseases, post-operative using. NSAID help patients by reducing the post-operative inflammation and swelling. NSAID can be administers through orally, intramuscular and intravenous. The types of NSAIDs include Diclofinat sodium, Diclofinat potassium, Ibuprofen, Naproxen... etc. for more effectiveness in some cases, combination between NSAIDS with opioids recommended in first day postoperative. (Fullerton, 2013).

2. Opioids

Opioids analgesics work on U-types receptors in the central and peripheral nerve system. The opioids either block transmission of pain in the spinal cord by blocking the pain signals. Opioids are administered orally, intramuscular and intravenous. Opioids analgesics are mostly and preferable analgesics to be used for short term pain management post-operative (Mustajoki, 2013).

Despite that opioids have perfect results in post-operative pain management. Also, it has some adverse effects. Which include: suppression of respiratory system which can be manifested by significant decrease in respiratory rate. Also patients could complain of tiredness, drowsiness, vomiting, and nausea after they take opioids. Addiction may be occurred after long term usage of opioids. In some cases, combination between opioids with paracetamol for patients with moderate to severe pain, mostly to get effective results. (Mustajoki, 2013). In the treatment of opioids, nurses should observe patient cardiovascular functions and respiratory functions as well as pain level. Indeed, pain scores should be evaluated before and after administering the medication to check whether the opioids helping patient to relieve pain. Nurses also make sure that patient get pain medication before pain become into severe phase. (Priff, 2005).

Non Pharmacological methods

Non-pharmacological methods are divided into two categories, the physical and cognitive-behavioral approaches. Among physical approaches

there are the transcutaneous electrical nerve stimulation (TENS), the use of hot and cold, massages and moderate exercises. While the cognitive-behavioral approaches include elements that can change perceptions of pain and improve the strategies of coping, such as relaxation, music therapy, distraction, guided mental imagery, hypnosis and Biofeedback (Horgas, 2015).

Patient counseling and preoperative patient education is important part of preparation for patients undergo surgery. Intraoperative and post-operative complication can be decreased by teaching and psychological preparing patients in advance to the surgery. According to Jones (2012) providing preoperative education and skills of pain is management, expected complications may occurred post-operative proves to decrease post-operative hospital stay which help patients by shortening recovery period. The patient's fear of post-operative pain May causes psychological distress and anxiety so nurses should explains pathway of pain management and the causes of pain which may improve their mind preparation to confront the pain. (Jones, 2012).

Nurses' main role is educator and counselor so they have to listen and provide comfort to the patient without being ambiguous. The patient expresses their feeling of pain in different ways, this depend on the level pain, its chronicity, suddenness, severity of pain, the culture of the patient, the loss of hope, and the past experience of pain. (Dagorne 2012; Jones 2012).

1.2 Statement of problem

Over the years, pain management has been the utmost challenge for healthcare practitioners and professionals and it is therefore an unavoidable subject. According to American pain management society, pain management has been considered as a fifth vital sign, which has been increased an awareness among health professionals. However, it has always been a challenge, since the pain is very individualized (Meissner, et al. 2015).

Patients hope that after surgery they will be free of pain and limitation. They may also have serious concerns about pain and suffering (Yilmaz, et al., 2011). Doubts regarding surgical success, fear of anesthesia, and fear of loss of ability are the main causes of preoperative anxiety.

A positive association has been found between preoperative anxiety and postoperative morbidity (Yilmaz, et al., 2011). The most important concern of patients is usually postoperative pain control, which is also affected by the anxiety level. Anxiety affects the patient's perception of postoperative pain and has a negative impact on recovery from anesthesia (Ayers, et al., 2013).

After surgery one of the main priorities in the postoperative care is to relieve the patient from pain when awakening from anesthesia. It is obvious that the surgical incision done during the surgery and anesthesia causes

patient to feel pain, discomfort and restlessness (Bosc, et al., 2015). When pain is adequately managed, it also helps patients to breathe properly and start ambulation as soon as possible. Acute pain begins from mild and develops into severe phase if pain is not managed well. After surgery, pain affects the patient overall recovery because uncontrolled pain are minimizes the self-care and early mobilization. Pain alone does not only give discomfort to the patient, but also it gives physical and psychological complications such as patient is exhausted, emotionally impaired, not able to receive enough rest and slow wound healing (Abrishami, et al., 2009).

So Adequate control of the postoperative pain start preoperative, plays an important role in perioperative psychological management, taking into account the fact that, beyond the fear for the outcome of surgery, the main concern of patients is related to postoperative pain's intensity, which is often perceived as the most unpleasant event of the surgical act.

While several studies have reported the influence of the preoperative psychological status of patient's postoperative outcomes such as pain (Fortier, et al., 2011; Gil, et al., 1992; Podeszwa, et al., 2015; LaMontagne, et al., 2003; Logan & Rose, 2005) the association between preoperative anxiety and postoperative pain still remains inconsistent over the time (Polomano, et al., 2001).

At the best of researcher's knowledge, there is no research done in Palestine on this phenomenon and if nothing was done, the number of patients who suffer anxiety related complications could continue to occur at high level, therefore this study conducted.

1.3 Significant of study

Preoperative anxiety effects on pain postoperatively may raise the importance of preoperative anxiety reduction strategies which expected to improve post-operative recovery and pain level. However, from my work experience, I noticed the lack of clear policies in our hospitals to assess and to treat preoperative anxiety. This study is aimed to illustrate the effect of high anxiety level on patient's post-operative pain level as a part of the overall patient's recovery process.

This study will help to identify relation between anxiety and pain among patients undergoing laparoscopic cholecystectomy surgery in Palestine that help health care providers those prepare the patients physically and mentally before the operation in order to relieve their stresses, anxiety, and the possible post-operative complication, so that they can recover from their affliction more quickly.

1.4 Aim of the study

The allover aim of this thesis is to identify and assess the relation between preoperative anxiety and postoperative pain and its related factors in patients undergoing laparoscopic cholecystectomy surgery.

1.5 Objectives of the study

To assess the effect of patient's demographic variables on the preoperative anxiety level.

To assess patients' anxiety level on the day of surgery, and its correlations with post-operative pain level including surgical site and shoulder pain in patients undergoing laparoscopic cholecystectomy surgery.

To assess preoperative anxiety effect on pethidine consumption during post-operative period on the day of surgery in patients undergoing laparoscopic cholecystectomy surgery.

1.6 Hypothesis of the study

H⁰: There is no correlation between preoperative anxiety level and post-operative pain level among laparoscopic cholecystectomy patients.

H¹: High anxiety level in the day of surgery increase pethidine consumption among laparoscopic cholecystectomy patients postoperatively.

1.7 Conceptual framework

1.7.1 Conceptual definitions

- **Surgery**: is a science and arts of treating problems, deformities, and injuries via incision or manipulation especially with instruments (Debas, et al. 2006).
- **Anxiety**: is an emotion characterized by an unpleasant state of inner turmoil, often accompanied by nervous behavior, such as pacing back and forth, somatic complaints, and rumination. It is the subjectively unpleasant feelings of dread over anticipated events. (American Psychiatric Association, 2013).

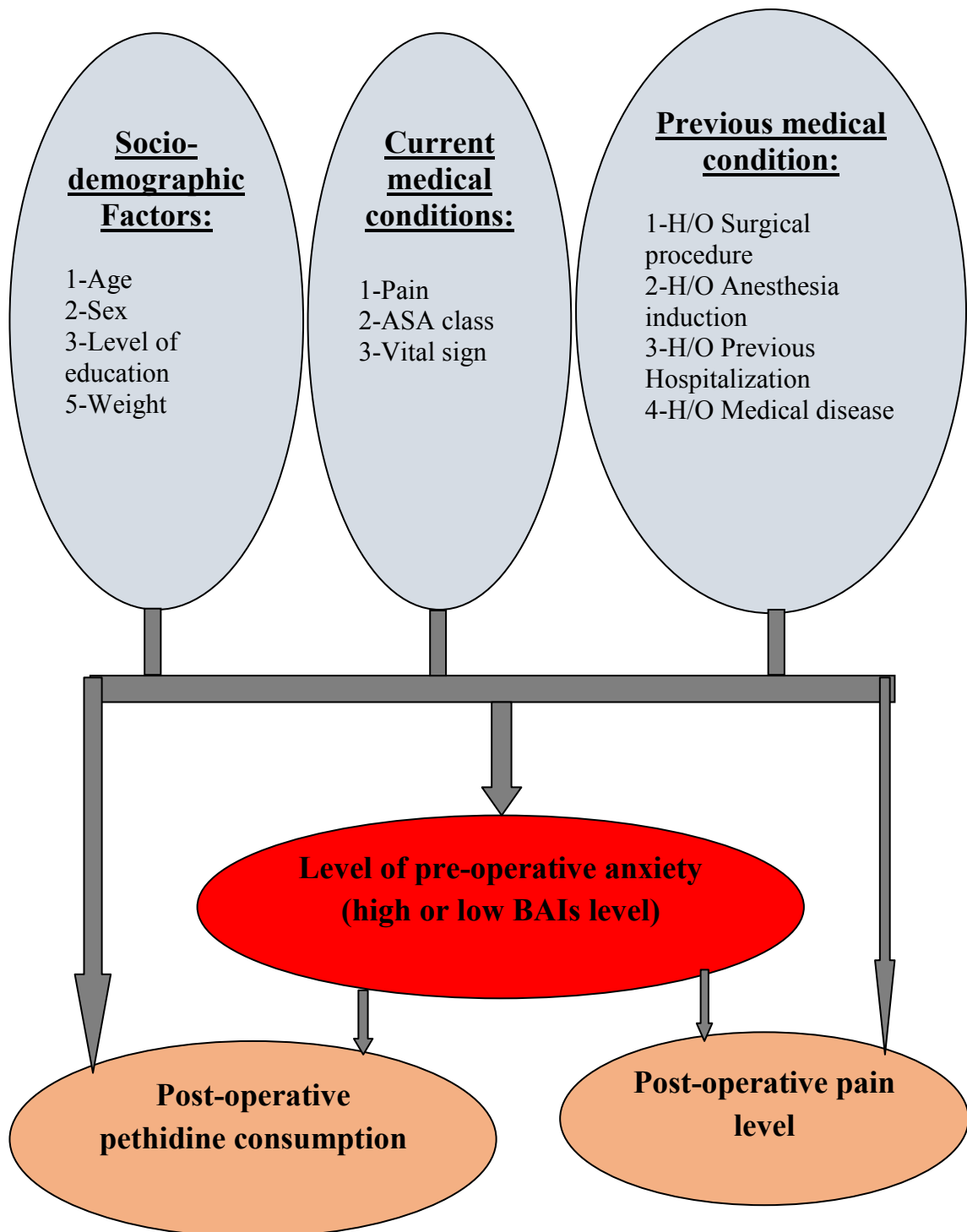
- **Pain:** is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. “In medical diagnosis, pain is regarded as a symptom of an underlying condition (International Association for the Study of Pain, 2015).
- **Analgesics:** is any member of the group of drugs used to achieve analgesia, relief from pain (Dworkin, et al., 2003).
- **Age:** the length of time during which a being or thing has existed; length of life or existence to the time spoken. OR a period of human life, measured by years from birth, usually marked by a certain stage or degree of mental or physical development and involving legal responsibility and capacity (dictionary, 2017)
- **Gender:** The state of being male or female (typically used with reference to social and cultural differences rather than biological ones) (oxford dictionaries, 2017)

1.7.2 Operational definitions

- **Surgery:** in this study laparoscopic cholecystectomy surgery just included.
- **Anxiety** is a feeling of apprehension, uneasiness, uncertainty, or dread resulting from a real or perceived threat that whose actual source is unknown or unrecognized, in this study anxiety measured using Beck Anxiety Inventory scale (BAIs).

- **Pain:** pain in this study measured using Visual analogue scale (VAS)
- **Analgesics:** Analgesic measured in this study is Pethidine consumption mg per kilo gram of the patient's weight.
- **Age:** Adult patients who are between 18 and 60 years old was measured in this study
- **Gender:** Both gender (male and female) was measured in this study

1.7.3 Framework:



Chapter Two

Literature Review

Chapter Two

Literature Review

2.1 Introduction

This chapter explores the literature relevant to the key terms identified in Chapter 1. The literature review provides a solid background to achieve research paper. It helps lay the foundation for the study and can inspire new research ideas. The early literature review of the report provides readers with a background to understand current knowledge about the subjects and highlights the importance of the new study.

Literature includes the physiology of pain and anxiety and the relationship between preoperative anxiety with postoperative pain.

2.2 Search Strategy

A comprehensive literature search was conducted using a number of electronic databases on the Internet, including which included Mosby's Nursing Consult, and Science Direct, CINAHL, Springer and PubMed. The research systematically addressed key terms previously identified in the study: anxiety, postoperative pain, psychological preparation, and preoperative anxiety. The published articles were accessed between 2000 and 2017; however, the relevant literature is older. Searches in the database were conducted in English only.

Checklists of selected articles were searched for literature that is likely to be relevant. Abstracts of the selected articles were drawn in this

way and their relevance to the study was determined. A large amount of literature has been identified in this way. The articles were then grouped according to the corresponding keywords and topics related to the study.

2.3 Gallbladder stone disease , symptoms and treatment

2.3.1 Gallbladder stone disease and symptoms

Gallbladder stone are frequently experienced among people. The prevalence of Gallbladder stone rising with age, at age of 70 years or more, 53% of female and 32% of male either have Gallbladder stone or have previously underwent Gallbladder stone surgery(Borch, 2012). Around 80% of all Gallbladder stone are non-symptomatic (Berger, et al., 2008). Being Female, age, obesity, low cholesterol levels are considered as major risk factors for the development of Gallbladder stone (Volzke, et al., 2005) and Gallbladder stone can lead to serious complications like common bile duct obstruction, acute cholecystitis, or acute pancreatitis (Vettrhus, et al., 2002). The diagnosis of Gallbladder stone is primarily based on pain. Also Since 1980 the Gallbladder stone disease has been diagnosed by abdomen ultrasound (Berger, et al., 2008).

The gallbladder stone attacks typical pain begins after eating late in the evening or at night. In 35% of cases, pain occur between midnight and 3AM and in most cases duration of pain is usually last from 30 minutes to five hours (Berhane, et al., 2006). Furthermore, Berhane et al. state that all patients had pain in their right upper quadrant of the abdomen. 90% of the

cases could identify an area of optimum pain. Optimum pain was located below the costal arch in 50% of the cases, 44% in the epigastria region, 3% said that pain located behind the sternum and 5% reported pain in the back. 74% of patients reported that the intensity of pain was very high despite used analgesics such as NSAID. Before the pain attacks started, 90% of the patients recognized a pattern of a low grade warning of pain and a need for walk around during the attacks. This was described by 71% of the patients. Other symptoms described by approximately half of the patient group during a gallstone attack were perspiration, constricting pressure under the diaphragm and difficulty in breathing. Dyspepsia and bowel symptoms were mentioned. Intolerance of at least one kind of food was experienced by 66% of the patients and almost half of the patients did not tolerate fatty foods (Berhane, 2006).

2.3.2 Treatment of gallbladder stone

Surgery is the main treatment of cholelithiasis. Earlier, open cholecystectomy was the ideal solution approach but decreased surgical complication with the laparoscopic cholecystectomy has much better with significant advantage include less postoperative pain, smaller wound scar, less hospital stay and faster recovery and back to normal daily activities and work (Berggren, et al., 2009). Compared to open surgery, less pain and fatigue and lower morbidity have been demonstrated with laparoscopic cholecystectomy. Moreover, there is also significant advantage clinically of laparoscopic cholecystectomy over open surgery because of lower

metabolic stress response. Patients with previous episodes of acute cholecystitis are more likely to respond a successful operation. Laparoscopic cholecystectomy is more likely to be successful when performed within 72 hours from onset of symptoms (Schirmer, et al., 2015).

2.4 Laparoscopic cholecystectomy (LC)

Laparoscopic cholecystectomy is one of the most common surgical interventions in the world. Approximately 50,000 LC surgeries are performed annually in UK and 500,000 in the USA (NHS, 2006). The first Laparoscopic cholecystectomy was done by Dr. Erich Muhe in Boblingen, in Germany 1985 and, at the same time, the two surgeons Philippe Mouret and Francois Dubois brought the method to clinical acceptance in France. The first video demonstration of Laparoscopic cholecystectomy was performed in Bordeaux by Jacqu Perissat in 1989 and this was the starting point for this procedure throughout Europe. In Scandinavia the first Laparoscopic cholecystectomy was performed in 1990 in Norway. Within a few years, almost all cholecystectomy procedures were performed by laparoscope in the western world (Wayand, 2004).

When performing a LC procedure, the patient is placed in a supine position with a steep head-up tilt under general anesthesia. To get access to the abdominal cavity, four small incisions, working ports (trochers) are made. To get visibility and access for dissection of the gallbladder, the abdomen is inflated with gas (usually CO₂) called pneumoperitoneum. In

this procedure, intra-abdominal instruments (approximately 300 mm) are used. The other incisions are used for optics, light, instruments for suction and electrocautery. The gall bladder is removed through one of the working ports. The operating time for LC with the aid of a robotic camera holder is approximately 70 minutes (Kalteis, et al., 2014).

2.5 Preoperative anxiety

2.5.1 Definition of anxiety

Anxiety is a universal and simpler human experience of emotions. According to Vacarolis, et al., (2006) it can be classified into four stages: mild, moderate, severe, anxiety and panic. Mild anxiety occurs in the normal experience of everyday life, which is positive because it drives the individual pulse to solve the problem more effectively. At this stage, the person may show physical symptoms such as mild discomfort, insomnia, or irritability. More severe than mild anxiety, moderate anxiety leads to narrowness of consciousness. The ability to think clearly is limited, but learning and problem solving can still occur, though not at the optimal level. Physical changes such as stress, palpitation, headache, and stomach discomfort may be observed. At sever level of anxiety, the person focuses only on specific details, and may be difficult to observe what happening around in the environment. A suffering person may experience hypoventilation, dazed, confused or unable to solve problems. Panic level of anxiety is the most extreme form and can result in disturbed behavior. The person is unable to recognize what is going on in the environment. He

may manifest confusion, shouting, screaming or withdrawal. His behavior may be uncoordinated, and impulsive. Self-behavior to reduce anxiety might be ineffective and acute panic anxiety may result in exhaustion. Person with sever level may suffer from a lack of breathing, dizziness, or unable to solve problems. Panic level of anxiety is the most extreme form and can lead to turbulent behavior. The person is unable to recognize what is going on in the environment. There may be confusion, screaming, shouting, or withdrawal. His behavior may be unformatted, and hasty. Self-behavior to reduce anxiety may be ineffective, anxiety and acute panic may lead to fatigue (Vacarolis, et al., 2006).

2.5.2 Anxiety before surgery

In preoperative period, the mean score of anxiety (measured by HADS) among the abdominal surgical patients was 7.78. On the second day postoperative the anxiety score decline to 5.59. Interestingly, the level of anxiety was found to be elevated (mean score = 6.11) on the 4th day postoperative. Then, on tenth day, it was significant decreasing (mean score = 5.11) (Carr, et al., 2005).

In general, preoperative anxiety affects patients in both the psychological and physical level. Psychologically, it can change the way an individual thinks, feels and works. Physically, anxiety increases the release of adrenaline in the blood circulation that causes constriction of blood vessels, tachycardia and the force of contractility, increase blood pressure,

temperature, sweating. It also leads to an inability to focus or difficulty performing tasks (Vaughn et al., 2007).

Preoperative anxiety was found to be a risk factor of poor postoperative outcomes such as mortality and morbidity. In a review of several studies, Kagan and Bartal (2008) confirmed that preoperative anxiety is negatively associated with pain, nausea, fatigue, discomfort, and need for rest, sleeping disorders, fatigue, inertia, low quality of life, length of stay, emotional recovery, and doses of drugs in anesthesia. In addition, anxiety preoperative can also affect the psychological state postoperative. In addition, preoperative anxiety may affect postoperative coping strategies and found that an increase in the level of anxiety leads to less effective coping strategies (Kopp, et al., 2013).

From the literature review, the relationship between pre- and postoperative anxiety has been found but is still inconclusive. Munafò and Stevenson (2001) described a mild to strong relationship between pre- and postoperative anxiety (correlation coefficients ranged from 0.22 to 0.65). However, with sample size of 146 patients undergoing emergency abdominal surgery, no relationship between anxiety scores before and after surgery was found (Karanci & Dirik, 2003).

Similarly, the association between preoperative anxiety and postoperative pain still remains inconsistent over the time. Some researchers reported a significant relationship between those two variables. The correlation coefficients varied from 0.18 to 0.46 (Kain, et al., 2000;

Munafò & Stevenson, 2001; Ozalp, et al., 2003; Polomano, et al., 2001). However, Kalkman et al. (2003) did not figure out any correlation between pain following operation and preoperative anxiety among general surgical population.

2.5.3 Anxiety measurements

Because anxiety is the basic psychological experience that occurs in every individual, there are many instruments that have been developed to evaluate it. The availability of anxiety tools allows evaluation of anxiety in different intensity as well as in different populations. Some of these questionnaires are the anxiety and depression scale in the hospital, the self-assessment anxiety scale, The Self-Rating Anxiety Scale, The Anxiety Status Inventory, and the Beck Anxiety Inventory which was used in measure anxiety in this study.

2.6 Pain: An Overview

Pain is significant common problem experienced in health care sittings (Lumley et al., 2011). 80% of physician's consultations related to of pain symptom and pain is that most common reason to seek medical attention (Voscopoulos & Lema, 2010).

“This landmark definition of pain was built upon in 1979 by The International Association for the Study of Pain (IASP) which defined pain as An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (IASP, 1979).

This definition of pain by the IASP becomes the most common definition of the term (Brown, 2008). However, definition strongly supports the theory that the experience of pain is subjective, not measured in objective terms. The IASP's definition recognizes that the pain has a physiological effect, and the patient suffering from it has a distinct psychological dimension. The definition of a rewarding hypothesis promotes that pain is a very individual experience and ultimately is the patient alone who is able to describe and understand what is being experienced (Macintyre, et al., 2015).

"From a clinical perspective, pain is generally divided into two categories: acute and chronic (Morgan, et al., 2006). "Krenzischek (2004) provided the following definitions for both types: Acute Pain – usually elicited by the injury of body tissues and activation of nociceptive transducers at the site of local tissue damage; pain that extends until period of healing”.

Simply Acute pain stems from trauma to the tissues of infections, infections or disease, for example infection or burns. The duration of acute pain usually lasts for a relatively shorter period of time, usually measured in days or weeks. Chronic pain - usually caused by injury but can continue through factors that are both genetically and physically traced remotely from the cause of origin: pain that extends beyond the expected period of recovery (3-6 months since the onset of pain) (Krenzischek, 2004).

There is growing recognition that acute pain and chronic pain are no longer completely different phenomena; instead, they simply represent two opposing sides of a continuum (Macintyre, et al., 2015).

This research project also focuses on the assessment and management of postoperative pain as the focus will accordingly remain on the concept of acute, not chronic, pain. As such, all future references in this thesis that are performed on pain indicate acute pain (postoperative) unless otherwise specified.

2.7 Previous studies

Ali, et al., (2014) conducted study attempted to compare the effect of preoperative anxiety on postoperative pain control and recovery from anesthesia in patients underwent laparoscopic cholecystectomy. A total of 80 patients who were underwent gallbladder cholecystectomy were registered. Demographic characteristics of patients were recorded. Patients with anxiety were included in the high anxiety group (group H) and patients with anxiety enrolled in the low-anxiety group (group L). The length of surgery, duration of anesthesia, take-off time, and adverse effects were recorded. During the postoperative period, patient-controlled analgesia was used with tramadol to control pain. Visual analog scale (VAS) scores and consumption of tramadol were recorded from all patients. Of all patients, 31 (38.72%) of patients had preoperative anxiety, and a significant correlation was found between the days of hospitalization and the preoperative outcome of BAIs .Group L developed less

postoperative side effects were determined. Also in group L, the result was postoperative and the consumption of tramadol was much lower, and there was less need for tenoxicam. High level of anxiety before surgery adversely affects the recovery of anesthesia and postoperative pain control. In this patient group, the need for postoperative accommodation should be increased.

Bradshaw, et al., (2016) conducted study that aimed to determine the relationship between the preoperative psychological status and the pain experienced postoperatively in a sample of Caribbean patients. A prospective study was conducted in elective surgical adult patients in an educational hospital in the Caribbean. The psychological condition of preoperative patients was assessed using the anxiety and depression scale in hospitals (HADS) and recorded as a result of "expected" pain before surgery. After surgery, "pain scores" were observed at 4 and 24 hours and maximum pain within 24 hours was recorded. Demographic data and clinical details were collected including postoperative data. The expected pain scores and control were compared among patients with and without anxiety and depression. Results: A total of 304 patients were registered. The overall prevalence of anxiety and depression was 43% and 27% respectively, based on Hades scores. There were significant correlations between postoperative pain scores and factors such as preoperative anxiety and depression (HADS) scores, preoperative expected pain scores, patient level of education, preoperative pain and surgical duration. Age, sex, race, and type of anesthesia did not affect postoperative pain outcomes. The

study concluded that an anxiety prior to surgery and depression as indicated by the HASA score may significantly affect postoperative pain. Other factors such as educational level, preoperative pain and duration of surgery may also affect postoperative pain. Some of these factors may be adjustable and must be treated in the preoperative period.

Simpson & Kellett (2008) conducted quantitative study that aimed to examine the relationship between pre-operative anxiety and post-operative delirium. 44 elderly patients underwent total hip replacement were evaluated one day preoperative and two days postoperative to explore the relationship between preoperative anxiety and delirium after surgery. Anxiety was measured by an inventory of state anxiety symptoms and a measure of delirium through a decrease in various cognitive performance measures. The relationship was not found and this is discussed in the light of two theories that could have been predicted. Other secondary outcomes are reported and discussed.

Shipton. (2013) conducted cross-sectional study investigated whether preoperative psychological factors can predict anaesthetic requirements and postoperative pain. 100 consecutive women completed pielberger's State-Trait Anxiety Inventory (STAI) and Pain Sensitivity Survey (PSQ). Propofol-controlled target was given to anesthetize anesthesia, and the air oxygen siphofluran was given to maintain equal depths of anesthesia, as determined by the Bispectral index (BIS) monitoring. The results showed that patients with higher anxiety scores (state and trait) required greater

amounts of propofol to reach light (BIS = 85) and moderate levels (BIS = 75) of anesthesia, but only anxiety was significantly associated with propofol requirements. Access to a deep level of anesthesia (BIS = 65). The Mach watch from sevoflurane was heavily associated only with the PSQ scores. The postoperative pain relationship was strongly associated with both STAI and PSQ. The study concluded that preoperative anxiety and pain sensitivity are independent predictions of propofol and sevoflurane requirements in general anesthesia. Anesthesia dose and painkillers can be adjusted based on preoperative anxiety and patient pain sensitivity.

Karabulut & Cetinkaya (2012) conducted a quasi-experimental study aimed to determine the effects of different training programs implemented before inguinal hernia operation on the pre- and post-operation anxiety level of and pain level of the patient. Quasi-experimental study was carried out with inguinal hernia patients 18 - 60 years who were hospitalized in the General Surgery Clinic of Hospital of Atatürk University and Süleyman Demirel Medical Centre in Erzurum for inguinal hernia operation. The study data was collected between November 2007 to May 2008 from 90 patients. 30 patients were in the control group, 30 were in the video (VCD) training group, and 30 were in the booklet training group. Data were collected by means of a questionnaire about the patients and the inventory of state anxiety for the adult. In collecting data, patient introduction form and Spielberger in State-Trait Anxiety Inventory, and visual analogue scale (VAS) were used. In data assessment, T-test, Pearson correlation test, Mauchly's variance analysis, Anova for repeated measures tests and

Bonferroni Correction Analysis were used. The Results showed in control, booklet and VCD groups, in group Situational Constant Anxiety score average was found significant in each three time periods ($p < 0.001$). When the pain situations of the patients after operation was considered, the distinction in Visual Analogue Scale and Verbal Rating Scala values of two groups in all measurement times was found significant ($p < 0.001$). Conclusion: in the conclusion of the study, it was found out that the given education effective on level of pain and anxiety score for experimental groups of patients.

Chieng et al. (2013) conducted study that aimed to examine the relationship between perioperative anxiety and postoperative pain in adolescents undergoing elective surgical procedures and the differences in perioperative anxiety and postoperative pain among subgroups of demographics. A quantitative systematic review used, studies published in English from the inception date of the databases to December 2010, using various combinations of search terms of 'adolescents', 'anxiety', 'pain', 'surgery' and 'correlation/relationship'. The Results of ten studies were included in this review from 943 studies initially retrieved. Adolescents who had higher level of perioperative anxiety experienced a higher level of postoperative pain. Inconclusive evidence was found regarding differences of perioperative anxiety and postoperative pain between demographic subgroups of gender, age and past surgical experience. The review Conclude that inform healthcare providers of the role perioperative anxiety plays on adolescents' postoperative pain and indicate the need to use

interventions to reduce perioperative anxiety and, therefore, optimize their postoperative pain management during the perioperative period.

Kumar & Sanjeev (2015) conducted study in India that aimed to find out the correlation between preoperative anxiety and postoperative pain. 80 female subjects undergoing hysterectomy were divided into 3 groups based on preoperative anxiety. Pain perception was assessed using VAS at 5hrs and 8hrs after surgery. Result showed that higher preoperative anxiety was positively correlated with increased post-operative pain. Thus prediction of post-operative pain based on preoperative anxiety level requires better tailored preoperative counseling and perioperative management improving patient outcome.

Nelson, et al. (2000) conducted study that aimed to investigate the relationship of postoperative anxiety and pain following coronary artery bypass graft (CABG) surgery, and to determine the effects of level of anxiety, demographic, and other factors on the level of postoperative pain. Pain intensity, sensory pain, and affective pain were measured along with anxiety on postoperative day 2 and day 3 by the McGill Pain Questionnaire Subscales (PPI, PRIS. and PRIA) and State Anxiety Inventory Scale, respectively. A direct relationship of anxiety with pain was found over time with the highest relationship on postoperative day 2 ($r = 0.235-0.492$, $P < 0.001$). A significant interaction between time and level of anxiety on affective pain was specific to postoperative day 2 ($P < 0.01$). Significant differences by level of anxiety and time were reported. Factors of age,

gender, marital status, number of previous surgeries, and operation time had no effect on the level of postoperative pain.

Kain, et al. (2000) conducted study to determine whether psychological variables such as preoperative anxiety can serve as predictors for the postoperative pain response. Methods: The study sample included women who underwent elective abdominal hysterectomy (n=53). Two weeks prior to surgery, characteristics such as trait anxiety, coping style, and perceived stress were evaluated. Throughout the perioperative period, state anxiety, pain, as well as analgesic consumption were assessed at multiple time points. The anesthetic and surgical management were carefully controlled for and postoperative pain management was standardized. Results: Path analysis demonstrated that there are both direct and indirect effects of preoperative state anxiety on postoperative pain. Preoperative state anxiety is a significant positive predictor of the immediate postoperative pain ($\beta=0.30$), which, in turn, is a positive predictor of pain on the wards ($\beta=0.54$). Pain on the ward, in turn, is predictive for pain at home ($\beta=0.30$). Conclusion: The results of this study indicate that preoperative anxiety may have a critical role in the chain-of-events that controls the postoperative pain response.

Sjöling, et al. (2003) conducted study that aimed to test whether specific information given prior to surgery can help patients obtain better pain relief after total knee arthroplasty (TKA). Secondary objectives were to study the impact of preoperative information on state and trait anxiety,

satisfaction with pain management and satisfaction with nursing care. The study was an intervention study with two groups of equal size ($n=30$). The intervention group was given specific information while the control group received routine information. Pain assessments were made preoperatively and every 3 h for the first three postoperative days, using the visual analogue scale (VAS). The results of this study suggest that information does influence the experience of pain after surgery and related psychological factors. The postoperative pain declined more rapidly for patients in the treatment group, the degree of preoperative state anxiety was lower and they were more satisfied with the postoperative pain management.

Robleda et al. (2014) conducted study that aimed to analyze the relationship between preoperative emotional state and the prevalence and intensity of postoperative pain and to explore predictors of postoperative pain. Observational retrospective study was undertaken among 127 adult patients of orthopedic and trauma surgery. Postoperative pain was assessed with the verbal numeric scale and with five variables of emotional state: anxiety, sweating, stress, fear, and crying. The Chi-squared test, Student's *t* test or ANOVA and a multivariate logistic regression analysis were used for the statistical analysis. The result showed that the prevalence of immediate postoperative pain was 28%. Anxiety was the most common emotional factor (72%) and a predictive risk factor for moderate to severe postoperative pain (OR: 4.60, 95% CI 1.38 to 15.3, $p<0.05$, AUC: 0.72, 95% CI: 0.62 to 0.83). Age exerted a protective effect (OR 0.96, 95% CI:

0.94-0.99, $p < 0.01$). The study concludes that preoperative anxiety and age are predictors of postoperative pain in patients undergoing orthopedic and trauma surgery.

Kavakci, et al. (2012) conducted study that aimed to investigate the relationship between the level of their anxiety and depression in the preoperative period and the pain level in the postoperative period, analgesic requirement, development of complications and the duration of hospital stay in patients followed up in an ENT clinic. Materials and Methods: One hundred and three ($n=103$) subjects [male = 56 (%54), female = 47 (%45.6)] filled out the Hospital Anxiety and Depression Scale, socio-demographic data evaluation form before the surgery. Postsurgical pain levels of the subjects were evaluated by the Visual Pain Scale. The analgesic requirements of the subjects were assessed and their duration of hospital stay was noted. Results: While the presence of preoperative anxiety was a predictor of postoperative pain, such a relationship was not found between depression and postoperative pain. On the Visual Pain Scale, it was observed that the anxiety levels were moderately correlated with the Visual Pain Scale assessments on the first day of postoperative period ($r = 0.30$, $P < 0.00$). Frequency of analgesic use and Visual Pain Scale assessments on the second day of postoperative period were negatively correlated ($r = -0.43$, $P < 0.000$). The study Concludes: For elective conditions requiring short-term hospitalization in ENT surgery, presence of preoperative anxiety seems to be a significant predictor of postoperative pain.

Chapter Three

The Method

Chapter Three

The Method

3.1 Introduction

In this chapter discussed research method including, population, study setting, sample, instrument, ethical considerations, data collection procedure, and data analysis.

This part defines well the research method applied for conducting this study. Also clearly explains the way of necessary information and data address. Justifications and rationalization for used selected research design, population, data collection instruments, sources of data, techniques of data collection and procedure, presentation of data, analysis method and analytical techniques that used are presented.

3.2 Design

A prospective cohort study of patients underwent elective laparoscopic cholecystectomy under general anesthesia used in this study. The aim of this study was to identify and assess the relationship between preoperative anxiety with postoperative pethidine consumption, postoperative pain on the day of laparoscopic cholecystectomy surgery and its related factors.

A cohort method is one type of longitudinal studies in that sample is a cohort that mean population shared same defining properties, typically

individuals who have a common event in specific time, such as underwent surgery or graduation).

Indications of cohort study include that a strong relationship between the cause and the effect, determined by any observational study, People depleted minimized when resources are plentiful.

The advantages of cohort studies is that it can help to identify the risk factors for a new disorders because it is a type of longitudinal observational of the people over the time, also data collection at regular intervals, so study errors is declined. However, the cohort data are time-consuming to follow to generate useful data, and expensive to conduct, also are sensitive to corrosion. However, the data generated from longitudinal observational cohort studies are significantly higher quality than those obtained from retrospective / cross-sectional studies (Polit & Beck, 2008).

3.3 Setting

This study was conducted in ST. Joseph hospital – Jerusalem. It's a private hospital, include seventy three beds with four main operation room, ICU unit, radiology department, laboratory department, and outpatient clinics department. The wards in hospital include medical ward, general surgery ward, pediatric surgery, thoracic surgery ward, orthopedic surgery, neurosurgery ward, and (E.N.T) ward. The hospital receives patients from east Jerusalem, west bank and Gaza strip for doing different medical management. Most of these patients are referral cases from the Palestinian ministry of health.

3.4 Population

The population was patients hospitalized for elective laparoscopic cholecystectomy. Usually, for the elective operation, patients admitted for one day before the surgery and stay in the hospital for a minimum one day before discharge or to be transferred to another health care institution.

3.5 Sample

Subjects were patients who underwent elective laparoscopic cholecystectomy in ST. Joseph hospital. They were selected by convenience of encounter as these following

A non-probability convenience strategy sampling technique was used; the patients who were presented through data collection time and agree to be participant in the research were selected. The patient list for operation was used to determine the patients in general surgery ward, and the sampling involved was on patients who would be operated on the day of data collection.

3.5.1 Selection criteria

Inclusion criteria

- Adult patients who are between 18 and 60 years old of both gender (male and female).
- Patients who classified as (ASA I; a normal healthy person) and (ASA II; patient with mild systemic disease without any functional

limitations) as Physical Status in Preoperative period Patients Classification According to the American Society of Anesthesiologists.

- Undergoing elective laparoscopic cholecystectomy
- Undergoing general anesthesia.
- Patient ability to communicate well and full level of consciousness
- Willing to give informed consent to participate in the study

Exclusion criteria

- Have any simultaneous operations on other parts of the body
- Patients with known to taking any type of anxiolytics or antidepressant medications, having mental retardation or known mental health problems or alcoholism patients.
- Have any accompanied trauma.
- Have any pre- or post-operative complications (shock, hemorrhage, infections, etc.).
- Emergency lap cholecystectomy.
- Patients have known other chronic pain.

3.5.2 Sample size

A power analysis was used to calculate the sample size. Three Elements required to determine estimation of the sample size: the

population effect size (γ), the power of the statistical test ($1 - \beta$) and the level of significance (α), (Cohen, 1977). Polit and Hungler (1995) recommended the conventional small, medium, and large effect size value for bivariate correlation tests are at 0.10, 0.30, and 0.50, respectively. The table allowing researcher to obtain the sample size based on the level of power and alpha was also provided (Polit & Hungler, 1995). The sample size in this study was estimated at α of 0.05, a power of 0.80, and the small γ of 0.25. Therefore, with the correlational design, the tentative number of subjects for this study was 95 cases. At the end of data collection, 100 patients participated in the study. All of them met the selection criteria of this study. Thus, finally, 88 respondents were included for data analysis; the other, 10 patients not cooperated during data collection and 2 patients developed complication post-surgery.

3.6 Instrumentation

Instruments in this study encompass of three parts:

1. Patient's profile record form.
2. The Preoperative Anxiety Measurement.
3. Visual analog scale for pain.

3.6.1 The Patient's Profile Form

The Patient's Profile form was developed by the study investigator, encompassing of two parts: the Socio-demographic data and the BAIs

(Index I). The Socio-demographic characteristics including age, gender and education level. The disease and treatment data carried the information about experiences of previous surgery, previous sedation, previous hospitalization, history of medical disease, regular medication, (ASA), pain level via VAS score and pre-operative vital sign.

3.6.2 The Preoperative Anxiety Questionnaire- Beck Anxiety Inventory Scale (BAIs)

This is one of self-reported scales aim to measure anxiety including 21 Items:

Reliability: the Internal consistency for the Beck Anxiety Inventory scale (Cronbach's $\alpha=0.91$), and the Test-retest reliability (one week) for the Beck Anxiety Inventory scale was 0.79 (Beck, et al., 1988).

Validity: The Beck Anxiety Inventory scale was moderately correlated with the revised version of Hamilton Anxiety Scale, and mildly correlated with the Hamilton Depression Scale (Beck, et al., 1988).

Scoring: Each item of the scale scores has response from 0 to 3 corresponding to "not at all" to "severely bothered" then calculate the total score by sum of the result of the 21 items included in BAIs. Total Score <17 are considered as a low level of anxiety. Total score of ≥ 17 and above are considered as a High level of anxiety.

3.6.3 Visual analog scale for pain (VAS)

A Visual Analogue Scale is a measuring tool that tries to measure a property or position that is believed to be graded through a series of values and cannot be easily measured. It is mostly used in clinical and epidemiological research to measure the intensity of pain symptoms. For eg: the degree of pain that patient feel ranges from across a continuum of nothing to the maximum degree of pain. As a classification of none, mild, moderate and severe level of pain (Gould et al., 2001).

Advantage of visual analog scale

The visual analog scale used among wide range of populations and settings because of its adaptability, simplicity. Also VAS considered highly sensitive to changes whether it was small more than pain descriptive ordinal scales in which pain scale are rated, for example, as mild, moderate, severe, extreme pain. VAS scale have high value when observe for pain changes within populations, VAS scale no need for than 1 minute to be complete, training is very simple just its require the ability to use scale ruler to identify distance to determine VAS score, and Assessment is clearly highly subjective.

Reliability: Test–retest reliability has been shown to be good, but higher among literate ($r = 0.94$, $P = 0.001$) than illiterate patients ($r = 0.71$, $P = 0.001$) before and after attending a rheumatology outpatient clinic (Burckhardt, et al., 2003).

Validity: In the absence of a gold standard for pain, criterion validity cannot be evaluated. For construct validity, in patients with a variety of rheumatic diseases, the pain VAS has been shown to be highly correlated with a 5-point verbal descriptive scale (“nil,” “mild,” “moderate,” “severe,” and “very severe”) and a numeric rating scale (with response options from “no pain” to “unbearable pain”), with correlations ranging from 0.71–0.78 and 0.62–0.91, respectively). The correlation between vertical and horizontal orientations of the VAS is 0.99 (Burckhardt, et al., 2003).

3.7 Ethical considerations

The proposal of this research was approved by An-Najah National University Institutional Review Board (IRB). It was also accepted by the authorities of ST. Joseph hospital to be conducted in their setting. For data collection, all patients were informed clearly about the aims of the study, the data collecting procedure and there is no risks may occur for them as well as their rights. Participations were voluntary and patients could withdraw at any time. The participant’s anonymity and confidentiality were respected.

All the forms were anonymous. No physical exam was implemented for further investigate of patient’s condition.

3.8 Data collection procedures

- All data were collected after the approval from An-Najah National University and from the ST. Joseph Hospital.

- Based on the operation schedule, the investigator visited the patients who met the eligibility criteria on the day of the surgery before 2 hours. The researcher introduced himself to build the relationship with patients. Investigator then informed patients about the study, ethical issues, and data collection procedures and invited them to participate in the research. Interview the demographic data including age, sex, weight, level of education, ASA, smoking , patient medical history, Vital-sign assessment of blood pressure, O2 saturation, temperature, heart rate and pain scale obtained.
- The preoperative anxiety level was then assessed after patients signed their consent forms by using BAIs also pain assessed using VAS and vital signs of the patients recorded from patient medical file. Patients were not disturbed by any activities of the researcher.
- Patients classified as BAIs to two groups: high anxious (Hs) patients ($BAIs \geq 17$) and low anxious (Ls) patients ($BAIs < 17$). Beck's anxiety inventory scale found online free.
- Both groups (Ls and Hs) assessed for time of induction, time of surgery, time of extubation, anesthesia adverse effect and surgical adverse effect. That all patients have the same surgical and anesthesia protocol by the same surgeon and anesthesiologist, in addition to that, all 88 patient's surgery process takes around one hour.

- Both groups (Ls and Hs) was assessed for (VAS) level, level of consciousness via Glasgow Coma scale, Hemodynamic and Pethidine consumption per kilogram early in Post Anesthesia Care Unit (PACU)
- Both groups (Ls and Hs) level of pain including surgical site and shoulder pain (VAS) was taken over 24 hours from patient's medical profile.
- Both groups (Ls and Hs) pethidine consumption per kilogram was taken over 24 hours post-surgery from patient's medical profile. Pethidine is given for patients those report (VAS) higher than 4 (Cut Off score > 4) as St-Joseph hospital pain policy.
- During data collection, if patients were in the middle of some procedures, the questionnaire would not be administered until they felt calm and comfortable to answer. Additionally, it was assumed that the information from the investigators might affect patient's perception and therefore, alter the way they experience as well as report symptoms. Thus, any further explanations related to symptoms from investigators were not recommended during data collections.
- After having all necessary information, data collecting forms were checked for completeness and prepared for analysis.

3.9 Data analysis

Data were analyzed by a statistical software statistical package for social sciences (SPSS 21). The alpha level for significance was set at 0.05.

The descriptive statistics and cluster analysis was used to describe the sample characteristics and enumerate the preoperative Anxiety and pain. The Pearson coefficient was used to explore the relationships. Independent t-test was used to assess relation between beck inventory anxiety, VAS and Pethidine consumption. χ^2 are used in cross tabulation of VAS in department and BAIs. Paired t-test was used to explore relationship between hemodynamic measurements pre and early post-operative. Binary logistic regression and linear regression was used to explore relation between patient's variables and pre-operative anxiety level, post-operative pain level and postoperative pethidine consumption.

Chapter Four

Finding of the Study

Chapter Four

Finding of the Study

4.1 Introduction

This chapter presents the analysis of the data collected to identify and assess the relationship between preoperative anxiety and postoperative pain and its related factors among laparoscopic cholecystectomy patients admitted in surgical wards of ST. Joseph hospital In Jerusalem.

Analysis is the process of organizing and synthesizing data, so as to answer research question and test hypothesis. After carefully collecting data, the research faced with the task of organizing the individual pieces of information, so that the meaning is clear. The data were analyzed according to the objectives of the study

The investigator collected the data for analysis, using standardized scales such as Visual Analogue Scale. In order to examine the proposed association the data was tabulated, analyzed and interpreted using descriptive statistics. The data was collected and presented under the following headings.

Table (1): Demographic characteristics and history of participants (N=88)

Variable		n	%
Gender	Male	31	35.2
	Female	57	64.8
Level of Education	School	49	55.7
	University	39	44.3
ASA class	ASA I	65	73.9
	ASA II	23	26.1
Smoking	No	48	54.5
	Yes	40	45.5
Surgical (Anesthesia) History	No	57	64.8
	Yes	31	35.2
Hospitalization history	No	28	31.8
	Yes	60	68.2
Medical history	No	65	73.9
	Yes	23	26.1
Medication history	No	68	77.3
	Yes	20	22.7
Age (Mean, SD, Min-Max)	46.7	8.7	28-60
Wt (Mean, SD, Min-Max)	83.7	11.3	63-110

ASA: American anesthesiologist association

Out of total sample, 35% of participants are male while 65% are female. Fifty five% school level and 45% had university level. Regarding ASA, most of participants (74%) were ASA 1. On the other hand, nearly half of participants were smoker. While 35% of participants had history of surgery, 68% had been previously admitted to the hospital, 26 % had medical history and only 23 % on medication regimen. Participants aged between 28 to 60 years with an average of 46.7 years old and their weight ranged between 63 to 110 kg with an average around 84 kg.

Table (2): Hemodynamic measurements pre and early post-operative among patient underwent laparoscopic cholecystectomy

Variable	PRE- OPERATIVE		PACU		PAIRED t test	
	Mean	Min-max	Mean	Min-max	t value	P value
VAS	1.3	0-2	0.5	0-3	6.63	0.001
SBP	128.7	100-155	117	90-160	7.1	<0.001
DBP	74.2	60-90	67	45-90	8.0	<0.001
HR	82.4	60-100	95	60-133	-11.3	<0.001
SPO2	97	93-100	97	88-100	0.91	0.36
RR	20	16-25	20	13-28	-3.4	0.001
TEMP	36.9	36-38				

PACU: post anesthesia care unit, **SBP**: Systolic blood pressure, **DBP**: diastolic blood pressure, **HR**: heart rate, **SPO2**: Oxygen saturation, **RR**: respiratory rate, **TEMP**: temperature.

Participants level of pain was higher in the pre-operative period (mean VAS= 1.3) comparing with their level of pain in the post-operative period (mean VAS= 0.5). Regarding the participants hemodynamic in the pre-operative period, the participant's systolic blood pressure was about 128.7 with a range between 100 to 155, and diastolic blood pressure around 74 and ranged Between 60 to 90. On the other hand, heart rate was around 83, SPO2 97, respiratory rate 20, and temperature approximately 37C°. when comparing the above reading with the hemodynamic reading at the recovery period in the PACU, all of them had a statistical significant differences with a p value less than 0.05 except the SPO2 which did not differ significantly between pre and post operatively (p value = 0.36) as seen in table 2.

Table (3): Frequency and mean of the BAIs items among patient underwent laparoscopic cholecystectomy

Variable	NO n %		MILD n %		MODERATE n %		SEVER n %		Mean
Fear of worst happening	6	6.8	20	22.7	59	67.0	3	3.4	1.6
Scared	8	9.1	32	36.4	46	52.3	2	2.3	1.5
Indigestion	13	14.8	23	26.1	46	52.3	6	6.8	1.5
Feeling of losing control	12	13.6	30	34.1	46	52.3	0	0	1.4
Terrified or afraid	16	18.2	39	44.3	33	37.5	0	0	1.2
Unable to relax	15	17.0	40	45.5	33	37.5	0	0	1.2
Fear of dying	33	37.5	29	33.0	25	28.4	1	1.1	.93
Hot/cold sweats	34	38.6	40	45.5	14	15.9	0	0	.77
Nervous	38	43.2	33	37.5	17	19.3	0	0	.76
Dizzy , lightheaded	32	36.4	51	58.0	5	5.7	0	0	.69
Heart pounding/racing	38	43.2	47	53.4	3	3.4	0	0	.60
Feeling hot	46	52.3	35	39.8	7	8.0	0	0	.55
Faint/ lightheaded	39	44.3	49	55.7	0	0	0	0	.55
Unsteady	49	55.7	36	40.9	3	3.4	0	0	.47
Difficulty in breathing	51	58.0	37	42.0	0	0	0	0	.42
Shaky/unsteady	55	62.5	31	35.2	2	2.3	0	0	.39
Face flushed	64	72.7	20	22.7	4	4.5	0	0	.31
Feeling of choking	66	75.0	22	25.0	0	0	0	0	.25
Numbness, tingling	73	83.0	15	17.0	0	0	0	0	.17
Hands trembling	76	86.4	12	13.6	0	0	0	0	.13
Wobbliness in legs	77	87.5	10	11.4	1	1.1	0	0	.13

BAIs: Beck Anxiety Inventory scale.

Table 3 revealed that the most common feelings among the participants were psychological in nature. Base on Beck Anxiety Inventory scale (BAIs) most participant felt "**Fear of worst happening**"(mean=1.6),

scared (mean=1.5), **"indigestion"** (mean=1.5), **"fear of losing control"** (mean=1.4), and **"terrified or afraid"** (mean=1.2). On contrast, the least common feeling were physical in nature which were **"Numbness, tingling"**, **"Hands trembling"**, and **"Wobbliness in legs"**. For more details, please see table 3.

Table (4): Independent t test between beck inventory anxiety, VAS and Pethidine consumption among patient underwent laparoscopic cholecystectomy.

Variable	BAIs		<i>t</i> test	
	LOW n=45 (51.1%)	HIGH n= 43(48.9%)	<i>t</i> value	<i>P</i> value
VAS Ward	5.3	7.0	-6.1	< .001
Pethidine consumption	1.1	1.9	-6.7	< .001

BAIs Beck Anxiety Inventory scale, **VAS**: visual analogue scale

Table 4 revealed that there is a statistical significant difference between the participant's level of anxiety and post-operative pain level (p value < 0.001). Participants who had high level of pre-operative level of anxiety (BAIs >17) is tend to develop a higher level of post-operative pain level (VAS mean=7) comparing with participants had low level of anxiety (VAS mean=5.3). Furthermore, there is a statistical significant difference between the participant's level of anxiety and post-operative pethidine consumption (p value < 0.001). Participants who had high level of pre-operative level of anxiety (BAIs >17) is be predisposed to consumed a higher dose of post-operative pethidine (mean=1.1mg/kg) comparing with participants had low level of anxiety (mean=1.9mg/kg).

Table (5): Cross tabulation of VAS in department and BAIs among patient underwent laparoscopic cholecystectomy using X^2

Variable		VAS of patient post-operative (24 hour post-operative)			
		MILD	MODERATE	SEVER	<i>P</i> value
Pre-operative BAIs	LOW	24 (82.8%)	15 (68.2%)	6 (16.2%)	< 0.001
	HIGH	5 (17.2%)	7 (31.8%)	31(83.8%)	

BAIs: Beck Anxiety Inventory scale, **VAS:** visual analog scale

Table (5) shows that there is a statistical significant relationship ($p < 0.001$) between the participant's level of anxiety pre-operative and their level of pain severity post-operative. The participants had low level of anxiety pre-operative, developed low level of pain severity post-operative.

Table (6): Binary logistic regression for participants' categorical variables and pre-operative BAIs

Variable	B	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
					Lower	Upper
Age	.016	1	.715	1.016	.933	1.107
Gender	1.874	1	.008	6.513	1.638	25.896
Weight	.045	1	.058	1.046	.998	1.096
LOE	1.721	1	.018	5.589	1.350	23.129
ASA	-.565	1	.583	.568	.075	4.285
Smoker	1.532	1	.011	4.627	1.417	15.113
Surgical History	.582	1	.329	1.790	.556	5.764
Hospitalization	.271	1	.692	1.312	.342	5.032
Medication	1.654	1	.146	5.226	.561	48.643
Pre-operative VAS	0.44	1	0.128	1.553	0.881	2.737

VAS: visual analog scale, **ASA:** American anesthesiologist association, **LEO:** level of education

Table (6) shows that gender, weight, level of education, and smoking were predictors of developing pre-operative anxiety among participants

underwent laparoscopic cholecystectomy (p values were 0.008, 0.05, 0.018, and 0.011, respectively). Female participant is 6.5 times more likely to develop pre-operative anxiety compare with male. Participants with high level of education are 5.5 times more likely to develop pre-operative anxiety. Smoking increases the chance of developing pre-operative anxiety by 4.6 times. Other demographic variables (age, ASA, surgical history, previous hospitalization, medication, and pre-operative level pain) were non-significant. Although, surgical history, previous hospitalization, medication, and pre-operative level of pain were non-significant, they increase the risk of developing the pre-operative anxiety level by 1.8, 1.3, 5.2, and 1.5 times respectively.

Table (7): Linear regression for participants' categorical variables and post-operative pain

Variable	POST OPERATIVE PAIN				
	B	t	Sig	95.0% Confidence Interval	
Age	.003	.100	.920	-.052-	.057
Gender	.935	2.411	.018	.163	1.708
Weight	.010	.658	.513	-.019-	.039
LOE	.449	1.092	.278	-.370-	1.268
Smoker	.792	2.276	.026	.099	1.485
Surgical History	.262	.689	.493	-.494-	1.018
Hospitalization	-.321-	-.723-	.472	-1.206-	.563
Medical History	-1.342-	-1.911-	.060	-2.740-	.056
Medication	2.083	2.830	.006	.618	3.549
VAS	-.042-	-.192-	.848	-.479-	.394

VAS: visual analog scale, **LEO:** level of education

Linear regression revealed that gender, smoking, and medication were statistically significant predictors for developing post-operative pain

(p values are 0.018, 0.026, and 0.006 respectively). Other demographic variables were non-significant.

Table (8): Linear regression for participants' categorical variables and pethidine consumption

Variable	PETHADINE CONSUMPTION				
	B	t	Sig	95.0% Confidence Interval	
Age	-.020-	-1.644-	.104	-.044-	.004
Gender	.340	2.008	.048	.003	.677
Weight	-.002-	-.275-	.784	-.014-	.011
LOE	.124	.692	.491	-.233-	.482
Smoker	.259	1.704	.092	-.044-	.561
Surgical History	.108	.654	.515	-.222-	.438
Hospitalization	-.022-	-.114-	.909	-.408-	.364
Medical History	-.683-	-2.228-	.029	-1.293-	-.073-
Medication	1.136	3.535	.001	.496	1.776
VAS	.045	.456	.650	-.152-	.242

VAS: visual analog scale, **LEO:** level of education

Linear regression revealed that gender, medical history, and medication were statistically significant predictors for Pethidine consumption post-operative (p values are 0.048, 0.029, and 0.001, respectively). Other demographic variables including age, weight, level of education, smoking, surgical history, previous hospitalization, and pre-operative pain level, were non-significant predictors for post-operative pain.

Chapter Five

Discussion

Chapter Five

Discussion

5.1 Introduction

Chapter five presents a discussion of the results chapter, deals with the discussion and summary of research findings in chapter four. In addition to this, it also deals with conclusion, implication and recommendation for further research.

The results are interpreted based on the literature review. Statistical significance is interpreted based on the P value ≤ 0.05 that indicates that the finding is statistical significance. The discussion also reflects the research questions.

The present study is undertaken to identify and assess the relationship between preoperative anxiety and postoperative pain and its related factors.

The major findings of the study were organized under the following headings:

- Findings related to Socio-demographic data of the subjects.
- Level of pain according to (VAS) pre and post-operative.
- Hemodynamic measurements pre, intra, and post-operative.
- Pre-operative anxiety level relation with Post-operative pain level and pethidine consumption.

- The factors associated with preoperative anxiety.
- The factors associated with postoperative pain.
- The factors associated with postoperative pethidine consumption.

5.2 Findings related to Socio-demographic data of the subjects

The sample of the study were distributed between both genders, age groups, education level and ASA as showed in table one, 35% of participants are male while 65% are female, which were consistent with literature that gallbladder stone is more in female group than male, according to Novacek, (2006) gallbladder stone rates are two time to three times greater among female than male. But this considered a childbearing phenomenon age. Also Pregnancy considered as one of the majors risk factors for gallbladder stones formation. The risk of gallbladder stone may relate to the number of pregnancies, sex hormones, estrogen, and hormonal replacement therapy such as oral contraceptives and in post-menopause females, all of this are increasing cholesterol secretion in biliary that result in increased cholesterol saturation of bile secretion. Also this risk factors considered to be associated with a rising the risk for gallbladder stone disorder. 55% of patients had school level education and 45% had university level which was higher regarding university level among the study participant comparing with Palestinian Central Bureau of Statistics (PCBS) 2014 that results indicate number of university level among Palestinian was 19%. Regarding ASA, most of participants (74%) were

ASA 1. On the other hand, nearly half of participants were smoker. While 35% of participants had history of surgery, 68% had been admitted to the hospital, 26 % had medical history and only 23 % on medication regimen.

Participants aged between 28 to 60 years with an average of 46.7 years old and their weight ranged between 63 to 110 kg with an average around 84 kg, this can be explained as one of risk factor for gallbladder disease related to age more than 40 years old according to Shaffer, (2005) who determined that prevalence of gallbladder stones rise with age, significantly after age 40 to become more with four to ten times likely in older peoples, also the type of stone changes with individuals age: initially being composed predominantly of cholesterol (corresponding to an increased cholesterol secretion into and saturation of bile) but in late life tending to be black pigment stones. Further, symptoms and complications increase with age, leading to more frequent cholecystectomies.

5.3 Level of pain according to (VAS) in pre-operative and early post-operative (PACU)

According to table 2 there is statistically significant difference between level of pain pre-operative and early post-operative level of pain, results showed participants level of pain was higher in the pre-operative period (mean VAS= 1.3) comparing with their level of pain in the post-operative period (mean VAS= 0.5). This can be explained as post-operative VAS reading was taken in PACU in which patients was usually still under effect of anesthesia and analgesia. This result consistent with study of

Iliescu (2016) that showed Immediately post-operative in PACU 58,9% of patients not complains of pain, the rest of patients complain of moderate pain level (31.3%) or mild (6.9%), this pain complain changed during the first 30 minutes. Most of patients that not complain of pain immediately post-operative were complain of pain in first half hours postoperative (78, 9%) complain of severe level of pain. Also in study of Ali, et al. (2014) they found a significant relationship between preoperative anxiety and post-operative pain level and increase in analgesic consumption postoperatively.

5.4 Hemodynamic measurements pre and early post-operative

Hemodynamic measurements are vital physiological indicators that change in stressful time such as preoperative time or hospitalization itself. Various studies have demonstrate multiple methods to decline preoperative anxiety (Garbee, 2011; Lin & Wang, 2005; Pager, 2005). A study of Tameh et al. (2011) found that intervention group receiving training for reducing anxiety has lower heart beat and blood pressure value preoperative. Our result according to table 2 there is statistically significance difference in pre-operative and early post-operative blood pressure, pulse, temperature and respiratory rate. the blood pressure, pulse and respiratory rate lower in post-operative period in (PACU), this can be explained by the high level of anxiety pre-operative that result in increased blood pressure, pulse, temperature and respiratory rate, also explained by anesthetic drugs that decrease hemodynamic measurements. in study of Bahrami, et al. (2013) in

Iran which showed stable hemodynamic measurements in time of hospitalization more than pre-operative time also this can explained by anesthetic medications that decline vital signs values.

5.5 Anxiety level pre-operative using BAIs scale

Most of patients experienced substantial anxiety pre-operative, and this is reported to affect 60–80% of patients undergoing elective surgeries. In a study carried out by Yilmaz (2011) in Turkey on patients who underwent gallbladder stone surgery, most of the patients preoperative in day of surgery experienced high levels of anxiety. And there is multiple factors affected level of anxiety. The anxiety level were found to be significantly more in females than males, also significantly higher in educated patients than patients with low education level. the present study results, as shown in Table (3) and based on Beck Anxiety Inventory scale (BAIs), showed that anxiety level were at moderate level at 2 hours before surgery without any steps were taken to reduce anxiety rather than routine nursing care, and the most common feelings among the participants were psychological in nature. Most participant felt **"Fear of worst happening"** (mean=1.6), scared (mean=1.5), **"indigestion"** (mean=1.5), **"fear of losing control"** (mean=1.4), and **"terrified or afraid"** (mean=1.2). On contrast, the least common feeling were physical in nature which were **"Numbness, tingling"**, **"Hands trembling"**, and **"Wobbliness in legs"**. This results is consistent with recent studies that suggested the prevalence of preoperative anxiety is 60-80%. The prevalence of preoperative anxiety was 64% among

patients underwent elective abdominal surgery in Pakistan (Erkilic, et al., 2017), 75.9% in preoperative period in Sri Lanka (Matthias, et al., 2012) and 71.1% in Jemma, 68% in Ethiopia (Nigussie, et al., 2014). The slight variation of the current study can be explained by inclusion of younger age participants and use of different assessment tool in those studies. Also according to study of Woldegerima, et al. (2017) study showed that preoperative anxiety was high in (59.6%) among patients underwent elective abdominal surgery. family concerns, urban residence, fear of death, young age, low income, dependency and disability were considered predictors of preoperative anxiety.

5.6 pre-operative anxiety level relation with Post-operative pain level and Pethidine consumption.

Patient's psychosocial factors are often ignored and not considered in the management of pain post-operative. In Hui (2009) review, anxiety was found to be an important factors for pain postoperatively, especially in gynecological, abdominal and obstetrical surgeries. An anxiety has been advocated as a factor in lowering pain threshold, facilitating overestimation of pain intensity and activation in the entorhinal cortex of the hippocampal formation. The state-trait anxiety theory predicts individuals with high trait anxiety are generally hypersensitive to stimuli and psychologically more reactive, albeit state anxiety in response (Hui, 2009).

In addition, Getto, (2008) on his study on abdominal surgery patient found that higher anxiety predicts higher postoperative analgesic

consumption. Other study by Linn, (2009) found that Psychological distress and preoperative anxiety can increase postoperative analgesic consumption and has negative effect of on pain immediately postoperative, also it's connected with transient suppression of the immune function, higher mortality, and a longer convalescence.

The relationship between mood and the development of postoperative pain has also been suggested by Tasmuth (2012), they concluded that postoperative pain increase among anxious and depressed patient's preoperative.

These studies are consistent with our study result that showed according to table (4) and table (5) that there is a statistical significant differences between the participant's level of anxiety and post-operative pain level (p value < 0.001).

In addition, there is a statistical significant relationship ($p < 0.001$) between the participant's level of anxiety pre-operative and their level of pain severity post-operative. Patients who experienced mild level of anxiety pre-operative developed mild level of pain post-operative.

5.7 The factors associated with preoperative anxiety

Table (6) shows that gender, weight, level of education, and smoking were predictors of developing pre-operative anxiety among participants underwent laparoscopic cholecystectomy (p values were 0.008, 0.05, 0.018, and 0.011, respectively).

Other demographic variables (age, ASA, surgical history, previous hospitalization, medication, and pre-operative level pain) were non-significant. Although, surgical history, previous hospitalization, medication, and pre-operative level of pain were non-significant, they increase the risk of developing the pre-operative anxiety level by 1.8, 1.3, 5.2, and 1.5 times respectively. Factors associated with preoperative anxiety as following:

5.7.1 Age and anxiety

It has been documented that preoperative anxiety decreases with age increasing. In study conducted by Bakr, et al. (2014) showed that young age group had more preoperative anxiety levels than old age group and the preoperative anxiety decreases as age increasing. But the finding of this study did not show any significant difference according to age. This may be explained that most patients underwent laparoscopic cholecystectomy are in middle age, and most of them from same age group, in this study the mean of age was 46 years old. This study consistent with, Fathi et al. (2014) and Basak et al. (2015). Nigussie, et al. (2014) who was reject a significant association between age and preoperative state anxiety.

5.7.2 Gender and anxiety

Multiple studies suggest, gender is independent predictor for preoperative anxiety and being female is associated with higher level of anxiety (Aalouane, et al., 2011; Caumo, et al., 2001; Erkilic, et al., 2017;

Jafar & Khan., 2009). High level of anxiety in women patients was explained by emotional sensitivity in female and high trait anxiety level (Forlani, et al., 2014). Also Fluctuations in hormones of progesterone and estrogen levels were considered in the processes of mood disorders including anxiety (Weinstock, et al., 2009). In this study, females were significantly more anxious than males on the day of surgery and their anxiety began sooner. According to table 6 there is significant increase in anxiety level among female participant is 6.5 times more likely to develop pre-operative anxiety compare with male. This result is consistent with many studies worldwide. A number of studies in day surgery have similar results. In a study of anxiety prior to day surgery and local anesthesia by Caddick, et al., (2012) women were found to have greater anxiety level ; Jlala et al (2010) likewise found women more anxious than men.

An Australian study by Luck et al (1999) investigating the impact of an information video and verbal/written information on the experience of colonoscopy, found women experienced more level of anxiety. Rosen et al (2008) determined that female's patients significantly had higher level of anxiety and Fekrat et al (2006) found females patients significantly more anxious than males.

Krohne & Slangen (2005) established that close emotional support preoperative lowered anxiety among female's patients but the opposite was true for male patients, the close emotional support increase in anxiety among males.

5.7.3 Level of education and anxiety

Educational status is one of frequently mentioned predictors of preoperative anxiety. Some studies suggested that preoperative anxiety is significantly observed in patients with higher educational status (Jafar & Khan, 2009; Caumo, et al., 2001; Aalouane, et al., 2011). In this study according to table (6) there is statistically significant in anxiety level according to level of education, Participants with high level of education is 5.5 times more likely to develop pre-operative anxiety. This can be explained by highly educated people have tendency to extrovert their feelings, information seeking behavior and awareness of possible complications (Nigussie, et al., 2014). Also as they get incomplete information from different sources, their anxiety level will escalate have more awareness about the risks involved in an operation and take in consecration all adverse affect even which very rare (Valenzuela, et al. 2014). Also educated people could express their anxiety level more precisely this consistent with many studies which reported that as educational status increased, anxiety level also increased as observed in other investigators (Caumo, et al., 2001; Uddin, 2012; Valenzuela, et al. 2014; Erkilic, et al. 2017).

5.7.4 Smoking and anxiety

A number of studies implicate anxiety as an integral component of the nicotine withdrawal syndrome and suggest that smokers are more likely to have an anxiety disorder than non-smokers, even though this relationship

is less clear in adolescents than adults (Gilbert et al., 1998; Hughes., 2004; Hughes et al., 2011; Hatsukami et al., 2014). The DSM-V-TR (APA, 2013) lists anxiety as a symptom of the nicotine withdrawal syndrome, but does not operationally define the construct to distinguish between clinical anxiety and anxious mood.

This consistent with finding of this study that there is statistically significant difference in anxiety between smoker and non-smoker Smoking increases the chance of developing pre-operative anxiety by 4.7 times.

5.8 The factors associated with postoperative pain.

Table (7) showed that gender, smoking, and medication were statistically significant predictors for developing post-operative pain (p values are 0.018, 0.026, and 0.006 respectively). Other demographic variables were non-significant.

This was consistent with study of Sadaf & Ahmad (2014) that showed women's were experienced pain more frequently (66%) than men (34%). pain Preoperatively was found to be significant correlation with pain postoperatively (P-value < 0.0001). also Smoking was found to be significantly correlation with pain postoperatively (P-value 0.014).

5.9 The factors associated with postoperative Pethidine consumption.

Table (8) showed that gender, medical history, and medication were statistically significant predictors for pethidine consumption post-operative (p values are 0.048, 0.029, and 0.001, respectively). Other demographic

variables including age, weight, level of education, smoking, surgical history, previous hospitalization, and pre-operative pain level, were non-significant predictors for post-operative pain.

According several theories, there are various reasons that can cause difference in pain and its management according to gender. In first, it could be caused by various socialization process for female and male, which influence on body response in distress communication (Cepeda, et al., 2003). Second, variation in hormones between male and female can also cause the difference in pain perception and their response to analgesics and analgesic consumptions. Also, gonadotrophic hormones considered to influence intensity of pain and affect sensitivity and consumption of opioids analgesics. In female during phase of luteal of menstruation demonstrate a lowering in pain threshold and high opioid consumption. Although, differences in pain according to gender has been disappear in elderly individuals, this also support the effect of Gonadal hormones on experience of pain (Aubrun, et al., 2005). Thirdly, females have more fat in their bodies than male's individuals. Opioids analgesics are more water soluble, therefore the concentration of opioids in blood could be lower in females than males (Niesters, et al., 2010).

This consistent with Khan, et al., (2013) study, they found significantly relationship between consumption of analgesia and gender, womens patients experienced higher intensity of pain and required greater doses of analgesics compared to men in order to achieve the similar degree

of analgesia during the first hour postoperative. But Contradicts with The Odoraki, et al., 2015 study that they conclude morphine requirements for patients undergoing major abdominal surgery Postoperative did not differ between female and male.

Conclusion and Recommendations

1. Conclusion

Based on the analysis of the findings of the study, the following inferences were drawn. There was a significant relationship between preoperative anxiety with post-operative pain and post-operative pethidine consumption among laparoscopic cholecystectomy. Thus, it was proved the relationship between anxiety and pain. Therefore, pre-operative anxiety reduction intervention should be promoted as an institutional policy and implemented as a routine care for all surgical patients.

2. Implications

The findings of the study have implication for health care services, health care education, health care administration and health care research.

a. Service

This study highlights the importance relationship between anxiety and pain in patients underwent surgery. The study gives the insight for the health providers to plan for post-operative pain in preoperative period by decreasing anxiety in various ways for patients. It will also improve the skills of pain assessment. In addition, decrease anxiety will result in reductions the need of pharmacological interventions in managing post-operative pain.

b. Education

The findings of the study can be of importance to the health care educators. Pain is a major symptom, which makes the man to consult the medical practitioner. Prove the relationship between pain and anxiety help educator to know the post-operative pain and which will guide them to impart the knowledge regarding anxiety reduction, pain assessment and the treatment.

This study can be used as an informative illustration for students who can effectively use this planned intervention in the patients post operatively .The educator can motivate the student to include multi ways of anxiety reduction intervention to decrease post-operative pain.

c. Administration

The findings of the study can be used by the health care administrator to improve care. Policies and protocols can be made regarding the preoperative health teaching, relaxation, physical training, psychological preparation and post-operative pain assessment and its care. Its can provide in-service education to the staff. This help to provide better pain management in post-operative patient's .Patients will recover fast due to pain relief.

d. Research

It provides new avenues for further studies in this area. The study will motivate the researcher to research in various health sectors and

provide quality care to the patients. The evidence based nursing will gain higher scope in health care setting.

3. Recommendations

a. Recommendation for policy maker

The findings of the study can be importance to make anxiety assessment tools and control strategizes policies in our hospitals for all surgical and hospitalization patients.

The policies should make anxiety assessment tools one of the importance patient's assessment profile and prepare them by clear interventional procedures to ensure removing their anxieties .

b. Recommendations for future research

- A similar study on a large and wider sample, for a long period of time would be more pertinent in making broad generalizations.
- A similar study can be undertaken in different settings.
- A comparative study can be conducted with Pre-operative anxiety treatment and post-operative pain.
- A similar study can be done in patients undergoing general surgery
- A study may be conducted to assess knowledge and practice of staff nurses regarding anxiety effect and pain management.

- Similar study can be done to assess preoperative anxiety effect on other post operation symptoms like vomiting, nausea and shivering..etc.
- Similar study may be conducted to assess preoperative anxiety before days that may assess the way of anxiety gradually increasing before surgery

4. Limitations

- The present study was limited to surgical unit of ST. Joseph Hospital, Jerusalem.
- The study was limited to postoperative patients who undergone laparoscopic cholecystectomy surgery.
- The present study was limited to only 100 patients.
- The present study was limited in the day of surgery.

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Appendices

Appendix (1)

Research questionnaire

Pre operative assessment

Age: Sex: weight: Level of education: ASA:
Smoker : yes, no .

Patient history :

H/O Surgical procedure : yes, no . H/O Anesthesia induction : yes, no .
Previous Hospitalization: yes, no .

H/O Medical disease (controlled) :

Regular medications :

Vital singe :

BP: HR: SPO2: RR: Temp: pain (VAS) : No,
mild, moderate ,sever .

Anxiety assessment (BAIs)

	Not At All	Mildly but it didn't bother me much.	Moderately - it wasn't pleasant at times	Severely – it bothered me a lot
Numbness or tingling	0	1	2	3
Feeling hot	0	1	2	3
Wobbliness in legs	0	1	2	3
Unable to relax	0	1	2	3
Fear of worst happening	0	1	2	3
Dizzy or lightheaded	0	1	2	3
Heart pounding/racing	0	1	2	3
Unsteady	0	1	2	3
Terrified or afraid	0	1	2	3
Nervous	0	1	2	3
Feeling of choking	0	1	2	3
Hands trembling	0	1	2	3
Shaky / unsteady	0	1	2	3
Fear of losing control	0	1	2	3
Difficulty in breathing	0	1	2	3
Fear of dying	0	1	2	3
Scared	0	1	2	3
Indigestion	0	1	2	3
Faint / lightheaded	0	1	2	3
Face flushed	0	1	2	3
Hot/cold sweats	0	1	2	3
Column Sum				

Anxiety Score cut off : Low (0-17) , High (exceeds 17) .

Intra and post operative assessment

Time of induction : Time of surgery : Time of extubation :

Anesthesia adverse effect :

Surgical adverse effect :

(PACU assessment)

Hemodynamic	5 min	10 min	15 min	30 min	1 hour	On Disch.
SPO2						
HR						
BP						
RR						
L.O.C						
VAS						

(Ward assessment)

Time											
VAS											
Intervention											

Patient complications :**Total Pethidine consumption (PACU & Ward) :**

Appendix (2)

Consent form

نموذج موافقة في المشاركة في دراسة بحثية

تأثير القلق ما قبل عملية استئصال المرارة على مستوى درجة الشعور بالألم وكمية المسكنات اللازمة ما بعد إجراء العملية.

اسمي علي عارضه طالب ماجستير في تخصص تمريض التخدير في جامعة النجاح الوطنية (نابلس) وأنا الباحث المسئول في هذه الدراسة

هذا النموذج يسمح بتطوعك بهذه الدراسة البحثية على العلم ان مشاركتك في هذه الدراسة تطوعية. قد تختار ان تكون جزءا منها او لا تكون. وتستطيع الانسحاب متى شئت بغض النظر عن القرار الذي اتخذته لن يكون هناك مسائلة ولن تخسر فائدتك المرجوة من العملية. الانسحاب من الدراسة لن يؤثر على الرعاية الطبية المقدمة لك. هذه الدراسة لن تؤثر على مجريات العملية والرعاية الطبية الروتينية كما لن تحوي معلومات عن هوية المتطوع او تمس خصوصيته.

الهدف من هذه الدراسة:

فحص تأثير القلق ما قبل العملية على مستوى الشعور بالألم وكمية المسكنات اللازمة خلال يوم ما بعد العملية.

ما هي مدة الدراسة:

سينتهي اشتراكك في الدراسة بعد يوم من إجراء العملية.

ماذا سيحدث إذا شاركت في هذه الدراسة:

مساهمتك في هذا المشروع ستسمح للباحث بتسجيل علاماتك الحيوية من (ضغط الدم وضربات القلب وكمية الاكسجين في الدم والحرارة ونسبه الشعور بالألم). ومعلومات اساسية كالعمر، الوزن الجنس الحالة الصحية العامة، والعمليات الجراحية السابقة. كما سيتم تقييم نسبه القلق ما قبل العملية باستخدام (Beck's anxiety inventory) وهو منظومة من المعلومات حول احساس القلق سوف تؤخذ عن طريق مقابله قصيرة مع الباحث ما قبل العملية. الباحث المسئول سيقوم بتسجيل معلومات طبية من سجلك الطبي حول مسار ومدة العملية. ونسبه الشعور بالألم وكميه المسكنات خلال يوم ما بعد العملية.

اسم المريض:

توقيع المريض:

Appendix (3)

IRB approval

**An - Najah
National University**

Faculty of Medicine & Health Sciences
Department of Graduate Studies

بسم الله الرحمن الرحيم



**جامعة النجاح
الوطنية**

كلية الطب وعلوم الصحة
دائرة الدراسات العليا

IRB Approval letter

Study title:

Pre operative anxiety correlation with post operative pain tolerance and analgesia consumption : prospective cohort study

Submitted by:

Ali Mohammad Arda.

Date Reviewed:

July 15, 2015

Date approved:

Aug 11, 2015

Your study titled: "Pre operative anxiety correlation with post operative pain tolerance and analgesia consumption : prospective cohort study" with archived number 2/Aug/2015 , Was reviewed by An-Najah National University IRB committee & approved on Aug 11, 2015 .

Hasan Fitian , MD

IRB Committee Chairman,
An-Najah National University

جامعة النجاح الوطنية
كلية الدراسات العليا

مدى ارتباط التوتر قبل العملية الجراحية بمستوى الألم وكمية
استهلاك المسكنات بعد العملية الجراحية: دراسة مستقبلية

إعداد
علي محمد علي عارضة

إشراف
د. جمال قدومي

قدمت هذه الأطروحة استكمالاً لمتطلبات الحصول على درجة الماجستير في تمريض
التخدير بكلية الدراسات العليا في جامعة النجاح الوطنية في نابلس، فلسطين.

2018م

ب

مدى ارتباط التوتر قبل العملية الجراحية بمستوى الألم وكمية استهلاك المسكنات
بعد العملية الجراحية: دراسة مستقبلية

إعداد

علي محمد علي عارضة

إشراف

د. جمال قدومي

الملخص

مقدمة: المرضى الذين يدخلون المستشفى لعملية جراحية، غالبا ما يعانون من اضطرابات القلق. القلق يؤثر على تصور المريض عن الألم بعد العملية الجراحية وهذا يزيد في استهلاك المسكنات بعد العمليات الجراحية.

الهدف: الهدف من هذه الرسالة هو تحديد وتقييم العلاقة بين القلق قبل العمليات الجراحية لاستئصال المرارة وبين الألم ما بعد الجراحة والعوامل ذات الصلة. أيضا، تحديد العلاقة بين القلق قبل العمليات الجراحية واستهلاك مسكن البينثادين بعد العمليات الجراحية.

المنهج البحثي: تم استخدام المنهج الكمي في هذه الدراسة. تم تسجيل عينة من مجموع 100 مريض الذين خضعوا لعملية لاستئصال المرارة بالمنظار. تم تسجيل الخصائص الديموغرافية للمرضى. تم قياس القلق بواسطة مقياس بيك. خلال فترة ما بعد العملية الجراحية، تم استخدام مسكن بينثادين بعد العملية للسيطرة على الألم. وتم تسجيل مقدار الألم بواسطة مقياس النظير البصري لقياس الألم وتم أيضا تسجيل كمية استهلاك بينثادين لجميع المرضى. وتمت عملية جمع البيانات في مستشفى سانت جوزيف في محافظة القدس. تم تحليل البيانات بواسطة برنامج (SPSS).

النتيجة: من مجموع العينة، 35% من المشاركين هم من الذكور و 65% من الإناث. ووفق مستوى التوتر، فإن المشاعر الأكثر شيوعا بين المشاركين كانت نفسية في طبيعتها. هناك فروق ذات دلالة إحصائية بين مستوى القلق قبل العملية ومستوى الألم بعد العملية ($P\text{-Value } 0.001$). المشاركون الذين لديهم مستوى عال من القلق ما قبل الجراحة ($BAIs < 17$) تميل إلى تطوير

مستوى أعلى من مستوى الألم بعد الجراحة ($VAS = 7$). وعلاوة على ذلك، هناك فرق إحصائي كبير بين مستوى القلق قبل الجراحة واستهلاك البيثادين بعد العملية قيمة ($P < 0.001$). المشاركون الذين لديهم مستوى عال من مستوى القلق قبل الجراحة ($BAIs < 17$) استهلكوا جرعة أعلى من مسكن البيثادين ما بعد الجراحة يعني 1.1 ملغ / كغ. (والجنس، والوزن، ومستوى التعليم، والتدخين كانت عوامل مساعدة لحدوث القلق قبل العمليات الجراحية بين المشاركين. أيضا، كان الجنس، والتدخين، والأدوية مؤشرات ذات دلالة إحصائية لنسبة حدوث الألم بعد العمليات الجراحية وعلاوة على ذلك، الجنس، والتاريخ الطبي، والأدوية كانت مؤشرا إحصائيا لاستهلاك مسكن البيثادين بعد العملية.

الخلاصة: استنادا إلى تحليل نتائج الدراسة، تم استخلاص الاستنتاجات التالية. كانت هناك علاقة كبيرة بين القلق قبل الجراحة مع الألم بعد الجراحة واستهلاك مسكن البيثادين بعد العمليات الجراحية في عملية استئصال المرارة بالمنظار. وهذا يثبت العلاقة بين القلق قبل العملية ومستوى الألم بعد العملية. لذلك، ينبغي تشجيع التدخل لتقليل القلق قبل العملية كسياسة مؤسسية وتنفيذها ضمن الرعاية الروتينية لجميع المرضى الجراحين.

الكلمات الدالة: القلق. استئصال المرارة. الألم. تسكين بعد العملية الجراحية.