University of Kerbala
Collage of Nursing

Effect of Acupressure Technique and Diaphragmatic Breathing Exercise on Nausea and Vomiting in Cholecystectomy Patient: A Comparative Study

A thesis Submitted to the College of Nursing Council/University of Kerbala, in Partial Fulfillment of the Requirements for the Master's Degree in the Nursing Sciences

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July2024 A.D **Muharam- 1446 A.H**

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حكما وعلما وكذلك نجزي
المحسنين ﴾

صدق الله العلي العظيم
سورة القصص- الآية (١٤)

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Dedication

I dedicate my effort and work to:

- Who inspired me with knowledge and the ability to work... **My God and my Lord**
- Who gave their life for my happiness. **My father, My mother**
- The shining stars in my life... **My brother and sisters**
- My love, my dear and my life partner...**My husband Zeid**
- To my lovely children Murtada , kyan who bring the joy to our life.

Bushra, 2024

Acknowledgements

Before start talking, I must thank Allah a lot for the blessings he has bestowed upon us. From the beginning of my journey in initiating this research to its end,

Many people have helped me in all stages of the research. My gratitude and respect for all their help, I must mention in this paragraph. I would like to express my sincere thanks to **Asst. Prof.Dr. Selman Hussain Faris** Dean of the College of Nursing, University of Kerbala. In particular,. I would also like to thank the **Asst. Prof.Dr. Hassan Abdullah Athbi** the Associate Dean for Scientific Affairs and Higher Studies at the college Nursing /university of kerbala, for his distinguished role in providing scientific advice and guidance during all steps of research. I would like to express my great appreciation and special thanks to the able supervisor **Assist. Prof. Dr. Hussam Abbas Dawood** for his constant guidance, support and time throughout the course of the study, and for the frequent revisions of the manuscript of the thesis.

I also Acknowledge infinite gratitude to all the experts who gave me their time and expertise in reviewing and evaluating the study tool. I extend my thanks and appreciation to everyone who works in the surgical wards - Imam Al-Hussein Medical City in Holy Kerbala and Safer Al-Imam Al- Hussein Surgical Hospital ; all patients who participate in this study.

Abstract

Background: Cholecystectomy is the second most prevalent abdominal procedure following appendectomy, but it is associate with number of adverse effect . Nausea and vomiting are the most frequent side effects of cholecystectomy. Therefore, this study aim to examine the effect of acupressure technique and diaphragmatic breathing exercises on nausea and vomiting in cholecystectomy patients.

Methods: A quasi-experimental study was conducted between September 26th, 2023 and May 12th , 2024, at the surgical word in the Imam Al-Hussein Medical City and Safer Al Imam Al Hussein Surgical Hospital. A non-probability(purposive) sample consists of ninety patients with cholecystectomy divided into acupressure technique, breathing exercise, and control groups. The data were collected for nausea and vomiting measurement by RINVR and VAS. The scale validity was investigated by panel of fifteen experts and reliability by a pilot study. Descriptive statistically analysis include frequency, percentage %; means score& standard deviation. The an inferential analysis concluded the analysis of variance (ANOVA) , paired sample t-test and an independent sample t-test were used to examine the study results, a p-value of < 0.05 was determined to be statistically significant .

Results: All the patients in the three groups had moderate level of nausea and vomiting; during pre-test assessment 53.3%, 46.7%, and 33.3% for control, acupressure, and breathing exercise groups, respectively. Furthermore , a significant difference in the nausea and vomiting level at p value of (0.000) and mean difference (1.300) was found in the post test time between control and acupressure groups. While mean difference between control and breathing exercise groups (0.933) at p value (0.000)

Conclusions: Acupressure technique and breathing exercises are effective method in reducing the severity of nausea and vomiting among patients with cholecystectomy.

Recommendations: This study recommended the important of performing acupressure and breathing exercises for patients with cholecystectomy suffering from nausea and vomiting.

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List of Abbreviations and symbols

Items	*Meaning*
5-HT3	**5-hydroxytryptamine**
ACTH	**Adreno corticotropic hormone**
ANOVA	**Analysis of variance**
BE	**Breathing exercises**
BMI	**Body mass index**
Cm	**Centimeter**
CNS	**Central nervous system**
CO2	**Carbon dioxide**
CSF	**Cerebral spinal fluid**
CTZ	**Chemoreceptor trigger zone**
D2	**Dopamine receptor**
DB	**Deep breathing**
e.g.	**For example**
ENT	**Ear, nose, throat**
F	**Frequency**
GA	**General anesthesia**
GI	**Gastrointestinal**
GIT	**Gastrointestinal tract**
H1	**Histamine**
ICU	**Intensive Care Unit**
II	**Optic nerve**
INVR	**Index nausea vomiting and retching**
IRCT	**Iranian registry of clinical trials**
IV	**Intravenous**
IV-PCA	**Intravenous patient-controlled analgesia**
IX	**Glossopharyngeal nerve**
L C	**Laparoscopic cholecystectomy**
LI 4	**Large intestine 4**
Mg	**Milligram**
MS	**Means of score**
N/V	**Nausea and vomiting**

NK_1	**Neurokinin 1**
NSAIDs	**Non steroid anti- inflammatory drugs**
NTS	**Nucleus Tractus Solitarius.**
OC	**Open cholecystectomy**
P.P	**Pages**
P. value	**Probability value**
P6	**Pericardium 6**
PACU	**post-anesthesia care unit**
PONV	**Postoperative nausea and vomiting**
PONVR	**Postoperative nausea vomiting and retching**
RCTs	**randomized controlled trials**
RINVR	**Rhodes index nausea vomiting reaching**
S	**Significant**
S.D	**Standard deviation**
SNS	**sympathetic nervous system**
SPSS	**Statistical package of social sciences**
ST36	**Stomach36**
TCM	**Traditional chinese medicine**
TDC	**Theory of dependent care**
TIVA	**Total intravenous anesthesia**
USA	**United states America**
V	**Trigeminal nerve**
VAS	**Visual analog scale**
VDS	**Verbal descriptive scale**
VII	**Facial nerve**
WHO	**World health organization**
X	**Vagus nerve**
%	**Percent**
&	**And**
>	**More than**
<	**Less than**
≤	**Equal or less than**

Chapter One

Introduction

Chapter one

Introduction

1.1.Introduction

The gallbladder is a small, pear-shaped organ located under the liver. It stores and concentrate bile made by the liver and sends it to the small intestine via common bile duct (CBD) to aid in the digestion of fat (Khalid, et al., 2021). Concentrating the bile is crucial for maximizing its physiological characteristics during the digestive process. The gallbladder can modify the content of bile by absorbing water and releasing lipids into it, the gallbladder can alter the bile's composition. A meal causes the gallbladder to release 70–80% of its contents due to cholecystokinin stimulation, while fasting causes only 20–30% of its contents to be released at intervals of 1-2 hours. When bile becomes saturated with bilirubin or cholesterol gallstones can develop. Inflammation of the gallbladder is called cholecystitis and is primarily due to obstruction of the cystic duct by gallstones (Wang,et al., 2022). Gallstones are mostly made of cholesterol (75%), with pigment making up the remaining 25% , the prevalence of gallstone disease is a significant public health concern due to its associated consequences, such as cholecystitis, cholangitis and pancreatitis (Wismayer, 2024)

A higher proportion of females than males experience the development of gallstones, with a 5% incidence rate among males and 20% incidence rate among females (Salih,et al., 2022).

Acute cholecystitis (AC) is characterized by pain in the right upper quadrant or the epigastrium that lasts more than six hours. The pain initially appears as a deep type, which typically progresses to a somatic form that is sharp localized to the right upper quadrant and radiates to the right scapula, right clavicular area and back. fever, chills, nausea, vomiting, and anorexia (Thangavelu ,et al., 2018).

Laparoscopic Cholecystectomy (LC) is among the surgeries that have a high incidence of postoperative nausea and vomiting (PONV) based on clinical studies the primary causes of PONV after surgery are the use of inhalational anesthesia and opioid analgesics LC is the golden choice in the treatment of gallbladder disease and has been proven to be better in the cost effectiveness-efficiency relation when compared to open surgery, out of 100 LC performed in Iraq in Baghdad between 20 and 42% present a complication of PONV (Mohsin, et al., 2022).

In addition to having a negative impact on the patient's comfort, PONV can result in severe complications that include hemorrhage, venous hypertension, metabolic imbalance, dehydration, and the possibility of pulmonary aspiration. Because of the patient's movement it may potentially worsen postoperative discomfort. Furthermore, PONV lengthens the time needed for postoperative recovery which could increase the expense of staying in a postoperative recovery center. For these reasons, treating and preventing PONV is important (Çakmak, et al., 2022).

Prokinetic agents, serotonin receptor blockers, dopamine receptor blockers, corticosteroids, anticholinergic drugs, antihistaminic drugs, neurokinin 1 receptor antagonists, benzodiazepines, and octreotide are some examples of multimodal pharmacological approaches used to manage PONV. However, it is important to note that these strategies may be associated with various side effects. Hence, the integration of non-pharmacological interventions with pharmaceutical approaches might effectively mitigate risk factors and avert surgical complications, hence optimizing patient outcomes. Complementary therapy, as defined by the National Center for Complementary and Integrative Health (2016) refers to an additional intervention that can be utilized alongside conventional medical treatment for the purpose of managing nausea and vomiting (Ibrahim, et al.,2020).

A Number of medical professionals are exploring non-pharmacological or alternative methods to prevent postoperative nausea and vomiting. This is because standard antiemetics often have undesirable side effects and new antiemetics can be rather costly (Glutten &Bane 2020).

Acupressure causes low frequency electrical stimulation of the skin sensory receptors which may activate ß and δ fiber's. These fiber's synapse within the dorsal horn and may in turn cause release of endorphins from the hypothalamus. In adding serotonergic and nor epinerphrinergic fibres may be triggered and a probable change in serotonin levels has role in prevention of PONV (Naik , et al., 2017).

Diaphragmatic breathing is a simple and cost-effective method for alleviating anxiety and PONV. Additionally, it offers several advantageous impacts on the patient's overall well-being (Emami, et al., 2018). Because diaphragmatic breathing exercises have a soothing and stabilizing effect on the autonomic nervous system and vagus nerve stimulation, which regulates gastrointestinal movements produces relaxation, and lowers anxiety, they minimize the occurrence of nausea, vomiting. Moreover, it eases the spastic contraction of the abdominal and respiratory muscles that occurs during vomiting and nausea (Moustafa ,et al., 2023).

1.2. Important of study:

The occurrence of gallstone disease differs among various groups. The prevalence in Western Europe ranges from 5.9% to 21.9%, while in American adults it is 10%. A prevalence rate ranging from 3.2% to 15.6% has been found in Asia (Wismayer, 2024).

On a global scale there exist variations in ethnicity and race, with lower prevalence rates among African Americans and East Asians compared to western countries. The prevalence of these variances tends to

increase with age, eventually reaching 30% in older populations, regardless of gender in their 70s. More than 20 million individuals are afflicted with gallbladder stones (Wang, et al., 2022).

Three decades ago gallstone disease in Iraq was thought to affect 11% of persons between the ages of 18 and 65 three decades ago. According to current reports persons of all ages have this number at 15% (Mohsin, et al., 2022). More women than men develop gallstones. Gallstones are most frequent in those 45 to 60 years old with 5% of men and 20% of women (Salamah, et al., 2023).

Acute cholecystitis is the most common adverse effect of gallstones occurring in 90-95% of cases usually caused by gallstones blocking the drainage of the gallbladder (Ridha & Kandil, 2019).

The most effective treatment for gallstones and several biliary disorders including cholelithiasis and cholecystitis is laparoscopic cholecystectomy (Salih, et al., 2022). Surgery is the mainstay of treating symptomatic benign gallbladder disease, the paradigm of classical surgery emphasizes the necessity of removing the gallbladder completely. Thus, one of the most popular abdominal surgery is laparoscopic cholecystectomy (Lunevicius ,et al., 2022). Cholecystectomy is the second most prevalent abdominal procedure in general surgery following appendectomy (Ridha & Kandil, 2019).

Each year more than 750,000 individuals in the United States receive cholecystectomy surgery. Although LC is a minimally invasive procedure, it can nevertheless cause postoperative discomfort such as stomach discomfort, shoulder pain, nausea, vomiting, and even urine retention (Imani, et al., 2024).

Conversion of open cholecystectomy (OC) to LC have been significantly more common in Iraq in Sulaymaniyah teaching hospital, particularly after 2019. This is indicated by a percent change From 485

patients, 383 were females and 102 were males, with a mean age of (42.43±13.31) years. Twenty-two cases (4.5%) were converted into LC (Faraj, et al., 2020).

The primary advantages of LC encompass a reduced duration of hospitalization, expedited resumption of regular activities, diminished postoperative pain, improved cosmetic results, and decreased rates of morbidity and mortality, these variables have essentially replaced open cholecystectomy as the primary treatment for gallstone disease, however, it is important to note that there is a possibility of experiencing complications such as discomfort, nausea and vomiting after undergoing laparoscopic cholecystectomy (Kilinç & Özlü, 2022) .

Postoperative complications pose a risk in all surgical procedures that require anesthesia, PONV is a frequent outcome, ranking second only to pain, a distressing, challenging condition, for patients (Hamid, et al., 2022)

Following general anesthesia, PONV, is a common problem that affects 20–30% of patients generally and can exceed 70% in patients in high-risk groups (Khalid, et al., 2021).

Postoperative nausea and vomiting is a distressing and uncomfortable illness experienced by people following surgery (Sahin, et al., 2018) risk factors are considered to play a multifactorial role in PONV are typical as anesthetic, surgical, and individual, with rates connected to more than 50% In patients who prolonged nausea and vomiting during the postoperative period may lead to wound dehiscence, pulmonary aspiration, blockage of the respiratory tract dehydration, and bleeding after surgery it can lead, imbalance of electrolytes, formation of blood clots, pain at the site of the wound, and delayed recovery and healing (Salamah, et al,. 2023).

Non-pharmacological management techniques can be employed to decrease PONV, acupressure, guided imagery, biofeedback, relaxation, hypnosis, distraction and practice deep breathing (Suryono, et al., 2020).

Acupressure is a noninvasive massage method with a long history, has been used to manage a range of ailments. The acknowledgment of this method by the World Health Organization (WHO) as a supplementary medical approach underscores its importance. The primary aim of acupressure is to promote a balanced and smooth circulation of chi energy along the meridians, which are the channels responsible for dispersing energy throughout the body (Imani, et al., 2024). Approaches are becoming more and more common since they are better tolerated, do not cause discomfort, and have no adverse medication reactions. Following a laparoscopic cholecystectomy, acupressure given to the PC6 point decreased postoperative nausea and vomiting (Çakmak, et al., 2022).

Breathing exercises are aimed at correcting breathing errors, restoring normal breathing patterns, increasing diaphragmatic activity, increasing alveolar ventilation, reducing energy expenditure during breathing, and relieving patients' shortness of breath in the postoperative period (Hussein & Taha, 2018).

Simple nursing interventions and deep breathing exercises led to significant improvement. By relaxing the autonomic nervous system and the vagus nerve, which control gastrointestinal movements, it is possible to reduce the intensity of PONV (Samami,et al., 2022). In addition it can increase oxygen levels in the blood and reduce tension and anxiety. Since deep breathing exercises reduce PONV and are inexpensive, simple, safe, non-invasive and easy to perform (Aybar,et al., 2020).

1.3.Problem statement:

Postoperative nausea and vomiting is a common side effect that occurs after surgery and anesthesia, with an incidence rate of

approximately 30% to 50%. Moreover, in a specific subset of patients who are at a heightened risk, the incidence of PONV can increase to 80% (Yang ,et al., 2019).

Nausea and vomiting that happens 24 hours after anesthesia ,do not result in death, they can be unpleasant side effects that lead to stays in post-anesthesia care unit, disruptions in electrolyte balance; and greater costs, esophageal rupture, venous hypertension and hemorrhage, suture strain and breakdown, potentially fatal airway compromise, and a decline in patient satisfaction . Though more serious consequences are uncommon, PONV is nearly usually self-limiting and nonfatal (Tateosian, et al ., 2018).

Postoperative nausea and vomiting risk after receiving general anesthesia, opioids are commonly given to patients after surgery. Pain has been identified as the primary factor responsible for inducing nausea during the process of recovery, as indicated by several research findings. Furthermore, PONV is frequently associated with surgical pain (Dobbeleir ,et al., 2018).

The choice of anesthetic and surgical procedure, namely general anesthesia, can have a substantial impact on patient satisfaction. Indeed, a significant number of patients perceive PONV as more psychologically and emotionally distressing than the pain experienced after surgery, based on a comprehensive analysis, the typical incidence rate of PONV is approximately 36%. However, this rate can rise significantly to 92% depending on several factors such as the specific surgical procedure, anesthesia method, patient's risk factors, and individual characteristics, all of which contribute to the likelihood of experiencing PONV (Alam, et al., 2023).

The laparoscopic cholecystectomy is one of the surgical procedures with a high rate of PONV (Miranda ,et al.,2020).

Mechanical and pharmacological effects trigger the release of central nervous system neurotransmitters that act at receptors in the vomiting center. Thus, it is essential that PONV be prevented and eventually managed order to provide best possible patient outcomes, and lower total healthcare costs (Tateosian, et al ,.2018).

Medical therapy has a high potential cost and a number of side effects. Given that the existing methods of anesthesia and antiemetic have been shown to be insufficient in lowering PONV. Several medication classes, including butyrophenones , phenothiazine, anti-dopaminergic, anti-cholinergic, and 5HT3 receptor antagonists, are used to prevent PONV. One typical disadvantage of these medications is their clinically significant side effects, which include drowsiness, dry mouth, and gastrointestinal symptoms (Raghavendra,2017).

Antiemetic medication is widely used but the management of PONV remains inadequate around 20% to 40% of surgical patients still, experience PONV following drug use conversely, drowsiness, headaches, constipation, and exhaustion are among the adverse effects of antiemetic medications. Thus, in order to treat PONV, medical professionals seek out low-cost, non-invasive techniques (Yang, et al ., 2019).

Recent research have emphasized the importance of non-pharmacological interventions. These therapies offer reduced risk, decreased invasiveness, and a smaller number of unwanted effects. as supplemental medicine (Imani ,et al., 2024).

Additional methods for prevention are now widely utilized and acknowledged. The additional strategies encompass guided imagery, behavior therapy, acupuncture, acupressure, relaxation techniques, and hypnosis (Hamid, et al., 2022).

Breathing exercises have been shown to effectively alleviate pain and nausea in individuals having laparoscopic cholecystectomy (Bastamizad, et al., 2023).

Patients with cholecystectomy still complain of these serious side effect in spite of the varies type of medication therapy and non-pharmacological interventions that used to alleviate these adverse effects. This study aim investigating the possibility of involving the non-pharmacological intervention in addition to the pharmacological intervention in the treatment plan for patients post-operation for the purpose of reducing or alleviating nausea and vomiting. Complementary therapies are becoming widely used by people around the world; therefore, this study will focus on two approach of these therapy these include acupressure wrist band on PC6 and breathing exercise and compare between the two intervention . Also, this study will investigate the effect of these complementary therapies in managing and prevention nausea and vomiting post operation in cholecystectomy patient.

1.4. Research question:

1.4.1.Does the application of the acupressure technique reduce the intensity of nausea and vomiting in patients with cholecystectomy?

1.4.2. Does the diaphragmatic breathing exercises reduce the intensity of nausea and vomiting in patient with cholecystectomy?

1.4.3.Does the compare between the effect of the acupressure technique and diaphragmatic breathing exercises reduce the intensity of nausea and vomiting in patient with cholecystectomy?

1.5. Hypotheses:

1.5.1. Null hypothesis (H0):

1. There is the application of acupressure technique and diaphragmatic breathing exercises does not significantly effect on nausea and vomiting in patient with cholecystectomy.

2. There is no significant difference between the effect of acupressure technique and diaphragmatic breathing exercises on nausea and vomiting in patient with cholecystectomy

1.5.2. Alternative hypothesis (H1):

1. Application of acupressure technique has a significant effect on the severity of nausea and vomiting in patient with cholecystectomy.
2. Diaphragmatic breathing exercise has a significant effect on the severity of nausea and vomiting in patient with cholecystectomy.
3. There is a significant difference between the effect of acupressure technique and diaphragmatic breathing exercises on nausea and vomiting in patient with cholecystectomy

1.6. Objectives of the study:

1. To determine the effect of the acupressure technique on nausea and vomiting in patients who have cholecystectomy.
2. To assess the effect of diaphragmatic breathing exercises on nausea and vomiting in patients who have cholecystectomy.
3. To compare the effect of acupressure technique and diaphragmatic breathing exercise on the nausea and vomiting in patients who have cholecystectomy.
4. To determine the correlation between the effect of acupressure technique and diaphragmatic breathing exercise with the socio-demographic features and clinical data of patients.

1.7. Definition of terms:

1.7.1.Acupressure :

A. Theoretical definition:

A noninvasive, simple, safe, inexpensive, and side-effect-free method to ensure the energy channels work effectively by using patient hands, fingers, or specialized stimulation bands to apply pressure to the

acupressure points on the channels that flow energy throughout body of patient (Kilin & Özlü 2022).

b. Operational definition:

An alternative healing technique using elasticized wrist bands containing a plastic button to stimulating PC6 acupoint in the body in order to reduce severity of nausea and vomiting in patients with cholecystectomy in Imam Al-Hussein Medical city and Safer Al- Imam Al- Hussein surgical Hospital.

1.7.2.Diaphragmatic breathing exercise:

A. Theoretical definition:

A breathing technique that involves slow, deep breathing through the nose while using the diaphragm ,which affects the brain, the circulatory ,respiratory and digestive system through the modifies of autonomic nervous system activity (Hamaski,2020).

b. Operational definition:

A technique done by patient with cholecystectomy that is performed breathing deeply and expanding the lungs into the diaphragm by taking breaths while expanding abdomen of patient and taking deep breaths through nose, pausing, then contracting your abdomen and slowly and completely exhaling through mouth.

1.7.3. Nausea:

a. Theoretical definition:

An uncomfortable feeling subjectively associated with the urge to vomit. This primarily affects the back of the throat and epigastrium, causing loss of stomach tone, duodenal contractions, and reflux of the stomach contents into the esophagus (Raghavendra ,2017).

b. Operational definition: A feeling of sickness desire or discomfort in the stomach that may come with sense of impending vomiting

postoperatively among patients with cholecystectomy measured by RINVR and VAS scale for nausea.

1.7.4. Vomiting:

a. Theoretical definition:

A process by which the upper gastrointestinal tract empty's itself of its contents when any part of the tract becomes overly irritated or distended (Raghavendra ,2017)**.**

b. Operational Definition:

The involuntary, forceful expulsion or emptying (“throwing up”) of stomach contents through the mouth postoperatively among patients with cholecystectomy measured by RINVR and VAS scale for vomiting .

Chapter Two

Review of literature

Review of literature

This chapter provides a thematic-theoretical overview of gallbladder disease, various management approaches for gallbladder disease, different types of cholecystectomy, strategies for managing nausea and vomiting, and non-pharmacological interventions for treating these conditions. Ultimately, the researcher aims to address these issues by applying a theoretical framework .

2.1. Overview of the gallbladder disease:

Bile can be concentrated and stored in the gallbladder. In the event that homeostasis is compromised, which might happen as a result of cholestasis, this puts the body at risk of accelerated the production of stones. A biliary waste product that develops during cholestasis frequently serves as a precursor to gallstones. It is made up of mucin, cholesterol microcrystals, and calcium bilirubinate. Some of these materials will approach the solvent limit and become solid, forming gallstones. The inflammatory response to this bile duct occlusion is acute cholecystitis(Sina, 2022), approximately 90% of cases of cholecystitis are caused by the presence of a stone in the cystic duct (Khalid, et al., 2021).

Gallstone disease continues to be a prevalent and substantial contributor to abdominal morbidity in many regions worldwide (Atiea, et al., 2020), about 10% to 20% of persons worldwide suffer from cholelithiasis, often known as gallstone disease, which is one of the hepatobiliarym conditions with the largest socioeconomic costs, Cholelithiasis is a significant risk factor for gallbladder cancer as well (Mahmood, 2023).

Obesity increased the risk of gallbladder stones which is increased cholesterol synthase activity that promotes bile cholesterol super saturation and the formation of gallstones high body mass index (BMI) causes slower metabolism of lipids and endogenous hormones, reducing

gallbladder movement and increase risk of gallbladder stones, the prevalence of gallbladder stones was higher among females than males. The presence of stones in the gallbladder, cholelithiasis, is common Gall stones affect over 20 million people about 6 million men and 14 million women in the US. Hormones such as estrogen and progesterone play an important role in high-risk diseases that are specific to women. Estrogen causes cholesterol super saturation by increasing cholesterol secretion while progesterone inhibits gallbladder contraction and causes cholestasis (Zhang, et al., 2022).

Gallstone symptoms sometimes manifest as pain in the right upper abdomen particularly in people who have consumed fatty or spicy foods, vomiting and nausea are common. Furthermore, it is possible to experience epigastric pain, that extends to the vertebral column or the right scapula, A positive Murphy's sign, which is felt with deep inspiration and deep probing to the right upper quadrant behind the rib cage is the traditional physical exam finding. Gallstones may not be discovered in patients for months or even years at a time, acute cholecystitis appears. It is more severe, by an entrapped gallstone may manifest as jaundice (Wilkins, et al., 2017).

2.2.Historical aspect of cholecystectomy :

Despite the rise of nonsurgical methods for treating cholelithiasis, cholecystectomy remains a prevalent procedure in general surgery, with approximately 300,000 cases being performed annually in the united states alone (Deng, et al., 2024), gallbladder removal is still the primary treatment for calculous or gallstone-free cholecystitis because there are currently no recognized effective drugs that can dissolve stones that have already formed surgery for cholelithiasis (Gaziev, 2022).

In the field of general surgery, cholecystectomy ranks as the second most often conducted abdominal procedure, following

appendectomy. There are two often conducted forms of cholecystectomies, namely open cholecystectomy and laparoscopic cholecystectomy. nevertheless, the selection of the technique is subject to significant variation based on criteria such as the patient's medical background and the preferences of the surgeon (Mannam, et al., 2023) .The initial performance of the classic open cholecystectomy occurred in 1882, under the supervision of carl august langer bach , he asserted that the gallbladder should be excised not due to the presence of stones, but because it facilitates their formation (Adnan, 2020).

Historically, the conventional method entailed creating a laceration measuring 10 to 15 centimeters on the right subcostal region, the surgical procedure involves the removal of the gallbladder, the popularity of the open approach has gradually declined, open approach is associated with a higher incidence of surgical trauma since around 30% of open cholecystectomies are reported to have complications (Balbaloglu& Tasdoven, 2023) .

2.3.Laparoscopic cholecystectomy (LC):

The revolution transpired in 1987, subsequent to a span of one hundred years, when French professor Mouret proposed an innovative LC procedure that fundamentally transformed the approach to managing gallstone disease, there by approaching the status of open cholecystectomy with LC. Subsequently, it has attained the status of a widely accepted and highly regarded procedure due to its numerous advantages, such as reduced hospital stays and recovery periods, expedited resumption of regular activities, diminished postoperative pain, thereby alleviating discomfort at the incision site, improved cosmetic results, decreased rates of illness , mortality and an overall enhanced quality of life in comparison to open surgery (Pateriya ,et al., 2021). Additionally, the shorter duration of hospital stays and the expedited return of individuals to society are contributing factors to this outcome in the process of choosing a

laparoscopic surgical technique it is imperative to prioritize the safety of the patient (Mannam ,et al., 2023).

The surgical treatment known as laparoscopic cholecystectomy is widely conducted on a global scale with an annual occurrence of around 14,000 operations in Sweden alone (Blohm, 2023). More than 20–25 million people or 10-15% of the population in the United States suffer from gallstones. LC is a common procedure that accounts for 90% of cases (Majumder, et al., 2020). In the US an estimated 1.5 million cholecystectomy procedures are performed each years (Thanagle, et al., 2018).

Laparoscopic cholecystectomy is a surgical procedure that has several advantages, including minimal invasion, rapid postoperative rehabilitation and effective pain treatment. It has been widely utilized in clinical settings. There are several factors that contribute to the occurrence of vomiting and nausea in patients undergoing LC. The construction of pneumoperitoneum in laparoscopic surgery typically involves the clinical administration of carbon dioxide (CO2). A significant infusion of CO2 or delayed release of CO2 leads to an elevation in the concentration of CO2 in patients' bloodstream resulting in hypercapnia. This, in turn, stimulates the central chemoreceptors triggering gastrointestinal symptoms such as nausea and vomiting, abdominal organ traction injuries during surgery can stimulate the vagus nerve, leading to the onset of nausea and vomiting (Pang ,et al., 2020).

2.3.1. Procedure of laparoscopic cholecystectomy:

The first step in a typical laparoscopic procedure is getting the patient ready for surgery local anesthetics are injected into planned skin incisions to start the procedure after anesthesia, sterilizing and drapes, the patient is surrounded by the dominant surgeon his or her assistant and the surgical nurse with the surgeon standing to the left of the patient and first assistant standing on the patient’s right side, abdominal access is obtained

(Majumder, et al,. 2020). The basic step of laparoscopic cholecystectomy include :

2.3.1.1.Abdominal access :

An abdominal open access below the umbilicus is commonly used. A 10 - 12 mm laparoscopic port is inserted, and pneumoperitoneum is created with CO2. An alternative is to use a verres needle in palmer's point, thereby creating the pneumoperitoneum before port insertion. A 30-degree laparoscope is inserted through an optical trocar. The gallbladder is identified, and the abdominal cavity is inspected to identify adherences or other complicating factors. A second 10 - 12 mm epigastric and 5 mm ports are 10 inserted in the right flank. In order to enhance accessibility in case of challenges, additional ports might be incorporated (Blom , 2023).

2.3.1.2.Dissection the gallbladder

Retracted using a grasper in a frontal configuration in order to facilitate the visualization of the cystic duct. The assisting surgeon maintains the stability of this traction. The gallbladder is dissected and moved with the use of a surgical energy device. Adherences vary depending on whether there is previous or ongoing inflammation. Typically, the dissection commences at the anatomical location believed to be the entry point of the cystic duct into the gallbladder, or more ideally, next to this region. Rouviere's sulcus, which is the sulcus of the caudate process, serves as a vital indicator for localization. The liver fissure, measuring 2-5 cm in length, encompasses the right hepatic artery, portal vein, and hepatic bile duct. This fissure is positioned between the right lobe and caudate process. In order to save the underlying bile ducts, it is advisable to refrain from conducting the dissection below them. The primary objective of the dissection is to liberate the artery and cystic duct from the adjacent tissues (Péré ,et al., 2020).

2.3.1.3.Removal of gallbladder and closure of wounds:

The gallbladder is removed through the sub-umbilical incision, separated from the liver, and placed in a retrieval bag ,after examining the liver, any bleeding that appears to be leaking through is stopped with an energy tool or by introducing a hemostatic substance, the ports are removed, any leftover bile and blood are aspirated, and absorbable sutures are used to heal the skin of fascia (Majumder, et al., 2020).

2.3.2.Contraindications laparoscopic cholecystectomy:

In the early years although LC has been widely accepted as the preferred method of treatment for cholelithiasis , it can nevertheless present difficulties due to a range of patient characteristics, including body habitus, previous abdominal surgery, abnormal anatomy and level of inflammation (Agarwal & Joshi, 2020).Also, large gallstones more than 8 cm in size, and uncontrolled bleeding disorders ,differences in the gallbladder's anatomy ,severe long-term pulmonary obstruction, ducts outside of the liver and heart failure with a congestive ejection fraction less than 20%, adhesions within the peritoneum ,old age, thick gallbladder walls, cholecystoenteric fistulae, complete gangrenous gallbladder, empyema of the gallbladder, obesity, pregnancy, ventriculoperitoneal shunt, prior upper abdominal surgeries, and cirrhosis are considered contraindications LC (Mannam, et al., 2023).

On the other hand, it has been reported that the rate of conversion of LC to open surgery is around 8.9% in general and higher than that in acute cholecystitis cases in particular compared to elective case among the patients who had previous upper abdominal surgery, one 2.3% patient developed a bile duct injury due to intense adhesions, this injury was repaired with surgical intervention primary repair and T-tube drainage (Katar & Ersoy,2021).

2.4.General complications after laparoscopic cholecystectomy:

Potentially fatal complications following laparoscopic cholecystectomy can be categorized as either non-biliary complications resulting from harm to other organs during the procedure or biliary complications resulting from injury to a portion of the biliary tree , bile collections, fistulae, and other complications of bile stasis increase the procedure's morbidity following LC and typically necessitate a second operation to properly repair and drain the biliary tree ,while described with a varying incidence, non-biliary injuries can be just as serious and debilitating as their biliary counterparts, these injuries can range in severity from minor to major injuries to the hollow or solid internal organs, potentially resulting in significant morbidity and mortality, other complications include common bile duct injuries, spilling gallstones in the peritoneal cavity, pre-peritoneal space inflation and surgical emphysema, and bowel injuries associated to trocars. bleeding may occur during the dissection of the gallbladder ,intestinal damage, liver damage, and infection at the port of entry The overall rate of complication was 18% (Agarwal & Joshi, 2020).

Other complication related to the heart, lungs, stomach, urology, nervous system, eyes, and other organs might arise during surgery. Adverse events can happen during the surgical procedure, shortly after the procedure is finished, or during the recuperation phase. Nausea and vomiting are two after-anesthesia consequences. Patients experience great distress owing to the serious issue of PONV (Dewi, et al., 2021).

2.5.Postoperative nausea and vomiting overview:

Postoperative nausea vomiting is a major worry for surgical patients, for many patients, the anxiety about PONV is worse than their pain from the procedure itself, Approximately one-third of surgical patients encounter PONV (Robinson, 2020). Vomiting and nausea are separate

from each other, vomiting is an objective clinical event when stomach contents pass through the mouth, while nausea is a subjective. Regarding PONV, the surgical procedure, along with the administration of medicines (opioids and vaporisable anesthetics), enhances the body's immune response by stimulating the brain's vomiting region, The risk factors associated with PONV include female gender, smoking, a history of motion sickness or the use of postoperative painkillers. The outcome is influenced by both age and anxiety (Oago &Alapiha, 2023).

The incidence of postoperative nausea and vomiting ranges from 30% to 80% following elective surgery, contingent upon the specific procedure, the anesthesia used, and the pa tient's predisposing risk factors. Motion sickness affects around 20% of the population, which amounts to 53 million individuals (Obsa, et al., 2020).

All surgical therapies include the consideration of postoperative complication risk for vomiting and nausea are commonly observed complications throughout the postoperative period. PONV refers to the occurrence of nausea, particularly when accompanied by vomiting, within 24 hours following the administration of general anesthetic. The occurrence of PONV is a common consequence in this particular method, impacting approximately 20-30% of the patients. In addition to eliciting pain in patients, postoperative neuropathy PONV (Cetinkaya, 2019).

2.6.Complication of post-operative nausea and vomiting:

Every surgical procedure that necessitates anesthesia entails a potential for postoperative problems. PONV is a frequently seen complication, ranking second only to pain (Hamid ,et al., 2022),surgical techniques including laparotomy and cholecystectomy increase the incidence of PONV is a painful experience for patients and can significantly impact their happiness(Jin , et al., 2020).

The patient is experiencing postoperative pain and discomfort ,fluid intake delays. Medical professionals often encounter various

electrolyte imbalances including hypokalemia, metabolic alkalosis resulting from hypo-natremia, dehydration, orthostatic hypotension, and nutritional disturbances. Surgical issue, anastomotic grafts and disruption, increased pressure within the brain and eyes, tears in the esophagus, wound healing, and bleeding , aesthesia issue aspiration-induced pneumonia may occur. and prolonged hospitalization. Furthermore, physiological complaints encompass symptoms such as pallor, abnormal cardiac rhythms, salivation, raise heart rate, and perspiration (Raghavendra, 2017). Also prolongs period of healing period, severe instances lead to the inhalation of substances into the respiratory passages, contamination within the surgical area, tension in the suture line, the development of blood clots and pain at the location of the injury (Cetinkaya, 2019).

Physical symptoms complication for nausea, vomiting, and retching can manifest as highly vigorous movements that impose significant strain on particular anatomical components, these strains have the potential to intestinal herniation, esophageal tears, hemorrhagic esophageal ruptures, fatigue, and muscular strain. The occurrence of postoperative vomiting might lead to bleeding from upper body skin flaps, eye hemorrhage, and wound dehiscence. Aspiration pneumonia, aspiration of vomitus, and respiratory obstruction are the primary complications linked to vomiting during the postoperative period. Psychologically, the experience of nausea can be highly distressing and potentially lead to a long-term avoidance of surgical procedures, particularly when it is triggered by a surgical intervention (Himani, et al., 2022).

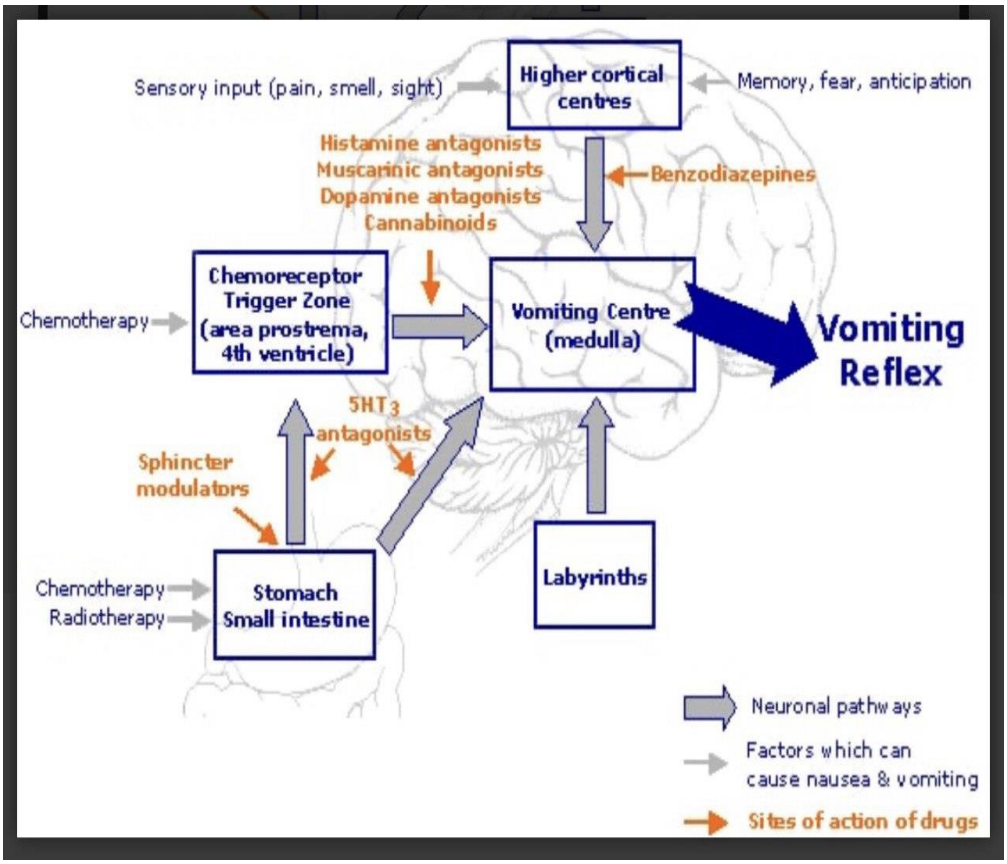
2.7.Pathophysiology of postoperative nausea and vomiting:

There are two phases to vomiting, which is the mouth-expelled gastrointestinal contents. Sympathetic signs, including pallor, tachypnea, sweating, and tachycardia, are present throughout the pre-ejection period. Muscular action during the ejection phase is directed toward protecting the airway and reversing the movement of stomach contents up the esophagus

strong contractions of the diaphragm and esophageal muscles, in tandem with contractions of the abdominal muscles, raise intra-abdominal pressure and cause the stomach contents to be expelled, in order to keep the expelled contents from contaminating the airway, the epiglottis is simultaneously draw n down over the larynx. The cranial nerves V, VII, IX, X, and VI's autonomic visceral afferents regulate the activity of the spinal nerve to the abdominal muscle (Greenlee & Darwin, 2021).

The stimulation of vomiting involves five basic afferent pathways as show in figure (2-1)

1. The chemoreceptor's trigger zone (CTZ).
2. The vagal mucosal pathway of the gastrointestinal tract.
3. Neuronal networks within the vestibular system.
4. Afferent reflex circuits originating from the brain cortex.
5. Afferents in the midbrain (Stoops & Kovac, 2020).



Figure(2-1):Factors causing nausea & vomiting, neuronal pathways. Seed (2017)

The five main neurotransmitters involved in the process of nausea and vomiting, which are targeted by drugs, are acetylcholine (specifically the M1/muscarinic receptor), dopamine (D2 receptor), histamine (H1 receptor), serotonin (5-HT3 receptor) and neurokinin (NK1 or substance P) (Collins& Owings, 2019).

Nausea and vomiting reaction stimulate individually for each of the five senses (sight, hearing, smell, taste, touch. CTZ is a region that comes into contact with blood and CNS, It is highly responsive to poisons, medicines, neurotransmitters, and other compounds that can cause vomiting (emetogenic drugs) present in the blood, Cranial Nerves IX and X work together to facilitate the gag reflex and transmit information to nucleus tractus solitaries (NTS), also gets inputs from the CTZ and both transmit signals to the vomiting center autonomously, gastrointestinal tract (GIT) detects irritants via chemoreceptors and reacts to physical stress through mechanoreceptors. The limbic and vestibular systems, including the vestibulocochlear nerve (CN VIII), also transmit signals to the vomiting center. This leads to the occurrence of vomiting and nausea caused by worry (Jared ,2023).

Anesthetic gases, including nitrous oxide, along with other sedative medicines, interact at various places within the complex system of causation to intensify the body's nausea response, temporary low blood pressure caused by the effects of anesthesia on the sympathetic nervous system (SNS) ,also increases the likelihood of PONV, Unpleasant stimuli can affect any of the five senses and create anxiety, pain, irritation in the gastrointestinal tract due to chemicals or mechanical factors, as well as the presence of blood and central nervous system contents from inside the body or from external sources. Other factors that can produce discomfort include changes in body position, changes in blood flow and the use of drugs for sedation and anesthesia (Cornish, 2023).

2.8.Risk factors associated with postoperative nausea and vomiting:

There are multiple established risk factors for PONV, but five characteristics are particularly noteworthy for their strong association with vomiting: PACU sickness, opioid usage, previous history of PONV, age below 50, and female gender. It was found that the probability of PONV increased from 7% when there was just one risk factor to 89% depending on the number of risk variables a patient reported (Stoops & Kovac , 2020).

There are many types of risk factor that are include:

2.8.1.Factors related to the patient:

Sex: Postoperatively, adult females experience a significantly higher incidence and intensity of nausea and vomiting, which is threefold compared to other groups. Age: The occurrence of post-operative nausea and vomiting in adults over that age 34-51% (Raghavendra , 2017), smokers had a 1.8 times higher likelihood of experiencing PONV compared to non-smokers. This discovery provides evidence that those who smoke are more prone to experiencing PONV, compared to those who do not smoke. Smokers generally show a slight reduction in PONV levels, the rationale behind smoking is that the individual develops a tolerance to the carcinogens and other harmful constituents of smoke, such as tar and nicotine. PONV is caused by central nervous system receptors. PONV is caused by central nervous system receptors such as dopamine, histamine, cholinergic, serotonin (5-HT3), and neurokinin receptors, It is likely that cigarette smoke's anti-emetogenic actions affect one of these receptors, causing a decrease in the receptor's response (Yosief, et al., 2022).

2.8.2.Surgical risk factor :

Every thirty minutes, add the surgery duration, and the PONV rises. PONV is one of the most common distresses, with incidence ranging from 12% to 38% and occasionally as high as 70% after in patients who

underwent LC , prolonged exposure to general anesthesia and larger dosage of opioid medicines can lead to an increased occurrence of PONV. Additional risk factors encompass stomach distention during mask inhalation, and the utilization of nitrous oxide and drugs. The incidence of PONV is also affected by the type of surgical procedure , laparoscopic cholecystectomy surgeries had a greater incidence of postoperative nausea and vomiting compared to other general surgical operations (Singh, et al., 2022).

2.8.3.General anesthesia risk factor :

General anesthesia cannot be used unless specific requirements are met. The anesthesiologist and the patient jointly make the decision (indication and contraindications) in advance. The general state of health of the patient must be such that heavy sedation is tolerated. Thus, factors such as age, physical condition, diseases (diabetes, cardiovascular), medications, body weight (obesity comorbidity), infections, and lifestyle choices (tobacco, alcohol, and other substances) are carefully examined (Oago & Alapiha, 2023).

A medical practice that is also known as anesthesia or drugs and it is intended to relieve the patient of pain cause them to lose consciousness and cause them to have temporary or reversible forgetfulness. The term "triad of anesthesia" refers to the three pillars of general anesthesia: muscle relaxant, which paralyzes skeletal muscles, analgesia, which reduces pain perception, and sedative or hypnotic, which puts the patient to sleep or calm. It is anticipated that during surgery, tens of millions of patients get general anesthetic. The administration of general anesthesia can occur through intramuscular, intravenous, inhalation, or gas. Intubation variables, such as the stimulation of pharyngeal mechanoreceptor afferents, anesthetics that block deeper or stomach impulses when breathing via a face mask, and inhalation anesthetics can lead to PONV during the first two hours after surgery (Saker, et al., 2023).

2. 8.4. Parenteral anesthetic risk factor:

Drug are injecting directly into the veins as one method of administering general anesthesia. Intravenous anesthetic medicines, such as ketamine HCl, thiopentone, propofol, diazepam, deidrobenzperidol, midazolam, pethidine, morphine, and fentanyl-sufentanyl, are examples of opioid opioids that can potentially lead to complications PONV can occur in 80% of patients undergoing surgery with anesthesia. PONV is a common adverse effect of anesthesia. Narcotic-based volatile drugs and anesthetics exhibit the highest incidence, after receiving general anesthesia, approximately three to four patients experience PONV patients who get regional anesthesia have a significantly reduced risk of PONV compared to those who receive general anesthesia, with a nine-fold decrease in risk. Non-opioid adjuvants, such as NSAIDs, beta-blockers and ketamine (Suandika, et al., 2021).

The use of ketamine for induction led to a greater occurrence of PONV compared to those who received barbiturates with nitrous oxide. The emetic action of ketamine is believed to be caused by the release of endogenous catecholamines. When ketamine is used as an additional treatment with fentanyl-based intravenous patient-controlled analgesia (IV-PCA) for the management of PONV, ketamine did not decrease the occurrence of PONV and actually worsened the intensity of nausea (Khanna,et al., 2022).

2.8.5. Regional anesthesia risk factor:

The occurrence of PONV is reduced when regional anesthesia is used alone, as opposed to general anesthesia ,following the administration of a spinal or epidural block the occurrence of low blood pressure can lead to nausea and vomiting through the process of vasodilation. Vasodilation causes a decrease in blood pressure and blood flow to the vomiting centers in the brain. Orthostatic hypotension, often known as low blood pressure,

occurring in the operating room or intensive care unit (ICU), can lead to the release of neuroreceptors in the central nervous system (CNS) that activate emetogenic neurochemicals, resulting in the sensation of nausea and/or the act of vomiting. For instance, administering ephedrine using vasopressors and appropriately replenishing intravascular fluid volume in a patient can potentially alleviate nausea and vomiting associated with this particular etiology (Khan, et al, 2021).

Anesthetic drugs can cause peripheral vessel vasodilation, leading to hypotension. This decrease in blood pressure can result in a reduction in cardiac output and venous return, which further decreases the amount of blood filling the right atrium. This hypotension can be responsible for the nausea and vomiting that occur during spinal anesthesia. In addition to the influence of the nerves and plexuses, especially the vagus nerve, the relaxation of the pylorus and bile duct sphincter leads to the presence of bile in the stomach. Psychological factors and hypoxia also contribute to this. Furthermore, there is a parasympathetic activity that causes an increase in intestinal peristalsis. Nausea and vomiting can cause airway obstruction, impairing the lungs' capacity to uptake oxygen, so adversely impacting the patient (Dewi, et al., 2021).

2.9.Apfel score and the koivuranta score accurately predicted the probability of postoperative nausea and vomiting:

The apfel score utilizes four markers to assess the risk of PONV in women: a history of PONV or motion sickness, non-smoking status, and the use of opioids during the postoperative period while in the hospital. The incidence of PONV increases by 18% to 22% for every additional point on the apfel score ranging from 0 to 1 suggest a minor risk of PONV, scores between 2 and 4 indicate a moderate risk, and values of 3 to 4 indicate a significant risk for the patient (Jin,et al., 2020).

The Koivuranta score **c**onsidered five characteristics to forecast the likelihood of PONV occurrence: female gender (1), non-smoking status (1), previous PONV episodes (1), history of motion sickness (1), and surgical duration exceeding 60 minutes (1). The patient is classified as having a low PONV risk if their score is between 0 and 1, a medium PONV risk if their score is between 2 and 3, and a high PONV risk if their score is between 4 and 5. The Sinclair ratings employ seven markers to assess the patient's likelihood of experiencing PONV. The indicators for this study include being under the age of 50, identifying as female, not smoking, having a history of PONV, experiencing motion sickness in the past, undergoing specific types of procedures such ear, nose, and throat (ENT), ophthalmology, cosmetic, abdominal, gynecological, and orthopedic surgeries, particularly those involving the shoulder and knee, receiving general anesthesia and the specific type of anesthetic used exceeding a duration of 30 minutes (Gunawan, et al., 2020).

2.10.Management of post-operative nausea and vomiting:

Antiemetic therapy can substantially decrease the occurrence of PONV, however it does not completely eradicate it, each patient, regardless of their level of risk, should have a personalized care plan that aligns with their preferences, cost-effectiveness, level of PONV risk, and any pre-existing diseases they may have. When a patient complains of PONV, it is advisable to select antiemetic from several clinical categories for prophylactic treatment. Administer rescue medication concurrently with a thorough examination to rule out any drugs that may be inducing the symptoms of nausea and/or vomiting, or any underlying mechanical causes (Khan& Hadi, 2021).

The antagonistic action of five out of the six chemical groups with direct antiemetic actions varies primarily against distinct emetogenic compounds at certain receptors; these interventions act in the postrema or on the free nerve endings of the vague nerve (Weibel , et al.,2020).

2.10.1Antiemetic drug classes:

2.10.1.1.5HT$_3$ receptor antagonists:

The first-line treatment for PONV prevention is 5-HT 3 receptor antagonists. Usually, ondansetron IV is given close to the conclusion of operation, this medication has also been shown to improve patient satisfaction following a variety of surgical procedures, including major surgical procedures, cesarean sections, and outpatient laparoscopic surgery, as well as early and late recovery. Granisetron has demonstrated efficacy as a standalone treatment or in combination with other medications for the management of PONV in patients undergoing laparoscopic surgery. Additionally, granisetron at a dose of 4 mg was effective in reducing PONV. Notably, a comparison between granisetron (1 mg orally) and ondansetron (4 mg intravenously) revealed that both medications were equally effective in reducing the occurrence of PONV, following laparoscopic procedures. Palonosetron a second-generation 5-HT 3 receptor antagonist, was found to be more effective than ondansetron or ramosetron for preventing nausea and vomiting ,in patients undergoing laparoscopic surgery ,It has a proposed higher efficacy and longer duration of action (Elvir ,et al., 2020).

This class of substances includes drugs that both centrally and peripherally block serotonin receptors. Serotonin (5-hydroxytryptamine, or 5HT) is a neurotransmitter that causes nausea and vomiting by binding to certain receptors in the gut and central nervous system. such as Palonosetron, granisetron, tropisetron, ramosetron, ondansetron, dolasetron (Weibel,et al., 2020).

2.10.1.2.Butyrophenone:

Medications such as Droperidol, Haloperidol, Metoclopramide, perphenazine, and Amisulpride are highly cost-effective treatments for nausea and vomiting. These medications work by acting on central

dopamine receptors. Despite the potential for side effects such as extrapyramidal symptoms and prolongation of the electrocardiographic QT interval, they effectively reduce nausea and vomiting by inhibiting dopamine receptors in the vomiting area and CTZ at low doses. It acts as an antagonist on H1 and 5-HT3 receptors, as well as D2 receptors, effectively blocking their activity. Furthermore, high doses of it impede the functioning of serotonin receptors and decrease the amount of time it takes for substances to pass through the intestines (Teshome, et al., 2020).

2.10.1.3.NK_1 receptor antagonists:

Through blocking NK-1 receptors at the region postrema, tractus solitaries nucleus, and reticular formation sites, they work. Both central and peripheral mechanisms of action are present in the NK-1 receptors (Cavaye,et al., 2022), Substance P, a neurotransmitter, causes nausea and vomiting by binding to the Neurokinin 1 receptor in the postrema region. Aprecipitant, casopitant, rolapitant, and fosaprepitant are the receptors that NK_1 receptor antagonists block, inhibiting this pathway In PONV, the nucleus tractus solitarius (NTS),subnucleus gelatinosus and chemoreceptor trigger zone (CTZ), or the area postrema, which is a crucial part of the central mechanism of vomiting, receive impulses from neurotransmitter-induced vagal afferent signals that originate in the gastrointestinal tract. The neurotransmitter networks that mediate vagal afferent impulses are possible targets for antiemetic medication therapy (Meyer, et al., 2023).

2.10.1.4.Corticosteroids:

Medications such as Betamethasone, Methylprednisolone, and Dexamethasone have been proven to be effective antiemetic, when given intravenously at a dose of 4-12 mg. Dexamethasone's antiemetic efficacy in patients undergoing laparoscopic cholecystectomy, may be attributed to its effects on the vomiting center at the medulla oblongata and central nervous system. these effects include alterations in blood-brain-barrier

permeability to specific blood proteins, changes in neurotransmitter activity (such as serotonin and dopamine), and suppression of prostaglandin production (Nazemroaya ,et al., 2022).

2.10.1.5.Antihistamines antagonists of histamine1 receptor:

Employed in the management of motion sickness as well as the vomiting and nausea. Histamine is a tissue hormone that opens up cerebral H_1-receptors to induce nausea and vomiting. Although blocking these receptors is the primary role of antihistamines (promethazine, dimenhydrinate and meclizine) in PONV prophylaxis they also have anticholinergic effects (Greenlee & Darwin, 2021).

2.10.1.6.Anticholinergics:

Anticholinergic drugs block the central binding of the neurotransmitter acetylcholine to the muscarinic receptor, resulting in a parasympatholytic effect, eg, transdermal scopolamine, before surgical nausea and vomiting begin, the antiemetic medication(s) must be given. The medication(s) may be administered before to surgery, during anesthesia, or at the beginning of anesthesia (Weibel, et al., 2020).

2.10.1.7.Preoperative hydration:

Preoperative IV fluid administration is an easy, quick, and efficient way to lower the incidence of PONV. Preoperatively maintaining normovolemia in patients through adequate hydration has a significant impact on lowering PONV; hence, the various types of fluids are identical (Koyuncu, et al., 2020). Fluid status is a major contributing element to the reduction of PONV. Upon investigation, it was shown that consuming a carbohydrate beverage before undergoing laparoscopic cholecystectomy was strongly associated with a notable reduction in the likelihood of experiencing postoperative vomiting, longer surgeries (>3 hours) had a significantly decreased risk of PONV compared to shorter procedures (<3 hours) due to the administration of additional fluids (Jin ,et al., 2020).

2.10.1.8. Decrease initial risk factors:

Research has shown that several perioperative factors reduce the occurrence of PONV . It is advisable to utilize loco regional anesthesia or propofol-based total intravenous anesthesia (TIVA) whenever feasible, as the combination of general anesthesia with an inhalational drug significantly amplifies the likelihood of PONV by ten times. According to the PONV risk score, we can decrease the initial risk factors by avoiding or minimizing the use of emetogenic medicines such as opioids , it is essential to decrease perioperative anxiety, hypotension, hypoxia, and discomfort (Teshome ,et al, 2020), Pharmaceuticals that have the ability to reduce the need for opioids and also help prevent nausea and vomiting , neuromodulator drugs such as benzodiazepines, cannabis, gabapentin, olanzapine, mirtazapine, tricyclic antidepressants, and clonidine have been proven effective in preventing nausea and vomiting by reducing the need for opioids (Cangemi & Kuo, 2019).

2.10.2. Non-pharmacological management for postoperative nausea and vomiting:

Non-pharmacological management is a potential alternative therapy for nausea without any side effects, whereas pharmaceutical treatments are often associated with undesirable side effects. Non-pharmacological interventions empirical evidence demonstrates that the act of relaxation leads to a diminished physiological response to norepinephrine. The hypothalamus serves as the body's integrator of awareness (Amirhosseini, et al., 2020). By combining non-pharmacological techniques with pharmacological treatments a multimodal approach can be used to effectively manage PONV in patients at high risk. Since the pathophysiology of PONV involves multiple systems that act on different receptors, a combination of treatment pathways is necessary (Ma, et al., 2019).

2.10.2.1.Aromatherapy:

The inhalation of essential oil or other substance vapors for therapeutic purposes is known as aromatherapy. Typically, isopropyl alcohol, peppermint oil, and ginger oil are vaporized in order to prevent or alleviate postoperative nausea (Kranke, 2016).

In the practice of aromatherapy, the relevant ingredient is absorbed and modifies the limbic system, which is a brain region associated with memory and sensation. Consequently, this stimulates the physiological reactions of the immune system, endocrine system, and nerves, which impact heart rate, blood pressure, respiration, brain wave activity, and hormone secretion. The herbal oil is topically and inhalation ally administered to facilitate its absorption into the body through the skin and respiratory system. Inhalation aromatherapy is a widely used technique that involves diffusing aromatic substances into a space or administering them using an oxygen mask (Amirhosseini, et al., 2020).

2.10.2.2. Music therapy:

Has been purported to reduce patient anxiety, discomfort, and vomiting, as well as shorten hospital stays and alleviate weariness following surgery. Listening to music can be characterized as a holistic intervention that seeks to promote physical, psychological, social, sensory, and spiritual healing. Historically, it has been utilized as an intervention in the field of healthcare .Listening to music is a non-pharmacological intervention that is simple to adopt, convenient to use, and has no negative side effects or associated costs. Music therapy is a non-pharmacological nursing intervention employed to alleviate the intensity of nausea, vomiting, and associated symptoms. Furthermore, a report indicated that listening to music has beneficial impacts on the duration of hospitalization, exhaustion levels, and the need for pain-relieving and anti-nausea

medications among patients who have undergone surgery (Çetinkaya, 2019).

Music is one of the most salient and frequently investigated approaches that has existed among these interventions in recent years as non-pharmacological approaches are used in the management of PONV. The American music therapy association defines music in this context as a purposeful and therapeutic modality introduced by health care professionals, the patient, or a music therapist. Music is implemented in the hospital environment to improve physiological, psychological, and emotional health (Ergezen, et al., 2022).

2.10.2.3.Chewing gum:

Chewing gum reduces systemic inflammation and has a high safety profile when it comes to treating postoperative intestinal ileus. It also increases gastrointestinal motility by vagal activation through the effects of sham feeding. Gum could therefore lessen the frequency, duration, and severity of PONV (Abdelkarim , et al ., 2020).

Chewing gum as non-pharmacological therapies, such as P6 stimulation with acupuncture modalities and ginger, which have advantages including low cost, favorable side-effect profile, and patient acceptability, has been prospectively evaluated as a therapy to reduce postoperative paralytic ileus after gastrointestinal surgery, chewing gum has also been linked to lowered cortisol concentrations, improved stress and anxiety, and more positive mood in the research setting (Darvall, et al., 2019).

2.10.2.4. Acupuncture treatment:

Acupuncture therapy is a form of treatment that involves the insertion of thin needles into specific points on the body to stimulate and balance the flow of energy, acupuncture therapy is well recognized and widely accepted as a popular form of physical rehabilitation. According to practical acupuncture prescriptions, the acupoint Neiguan (PC6), which is

commonly employed, has been found to have a strong potential for reducing PONV. Furthermore, acupuncture therapy has been shown to decrease the occurrence of pain and PONV in several surgical procedures for both adult and adolescent patients (Fu, et al., 2020).

Meridian theory is a fundamental idea in traditional Chinese medicine (TCM) theory which comprises sub-collaterals, collaterals, and meridians. The system's primary components are the meridian, collateral, and sub-collateral channels' various sizes. Qi-blood is an important consideration associated with the pathway system. The essence of the body is energy, goes into the channels. It can spread through blood and qi channels to all organs and tissues. Acupoints are places where Qi-blood enters or leaves the meridian pathways according to TCM theory. It is thought that acupoint stimulation can help open channels and encourage Qi blood flow Stimulation of acupoints alone or in combination with intravenous drug can reduce the incidence of PONV (Zheng, et al., 2021).

2.10.2.5.Acupressure therapy:

The World Health Organization (WHO) has identified interesting activities to participate in an effective non-drug treatment to reduce nausea and vomiting is acupressure at the pericardium 6 (P6)-point, also called the P6-point in Chinese medicine. P6 It stimulates the point and is considered important in the administration of acupressure to individuals suffering from nausea and vomiting. Stimulating the PC 6 factor (Nei guan) can decorate the release of beta-endorphins in the pituitary gland and adreno-corticotropichormone (ACTH) inside the chemoreceptor trigger quarter (CTZ).This can efficaciously suppress the vomiting middle and alleviate symptoms of nausea and vomiting. Acupressure on the P6 point is a non-pharmacological therapeutic strategy that shows promise as a holistic alternative for managing symptoms of nausea and vomiting (Abolwafa, et al., 2024).

Acupressure is a noninvasive technique that is low-risk, safe, uncomplicated, and free of negative effects. due to its enhanced patient tolerability and absence of drug-related side effects or pain, it is increasingly being used as a supplemental therapeutic technique for preventing and managing PONV. Acupressure applies gentle and sustained pressure to energy channels and acupressure points. The P6 point on the human body is a specific location that can be stimulated to produce a physiological response. Applying pressure to this location can effectively manage patients' nausea and vomiting. The primary area of interest in most non-pharmacological studies on alleviating nausea and vomiting is the PC6 acupressure point located on the wrist show in figure (2-2). Stimulating the PC6 point on the pericardium meridian is believed to trigger the nervous system, which then sends messages to the brain, resulting in the production of an antiemetic effect (Kilinc&Özlü, 2022).

Figure (2.2) Location of acupoint P6 for acupressure. (Seed, 2017).

2.10.2.6.The effect of the acupressure technique on the severity of nausea and vomiting:

Stimulating particular places (acupoints) on the skin's surface, which are distributed throughout the body, is the main goal of treatment to reestablish the flow of Qi. Once triggered, these acupoints produce

homeostasis and are linked to meridians that go to organs. acupoint stimulation β-endorphins released in the cerebral spinal fluid (CSF) or the activation of serotonergic and noradrenergic fibers that release serotonin are the mechanisms by which acupressure protects and lowers PONV. Acupressure triggers the release of endorphins, which block CTZ signals by activating sensory nerve fibers of type I and II and transmitting messages to the spinal cord, acupressure stimulates the midbrain to secrete encephalin, which subsequently triggers the release of neurotransmitters like serotonin and adrenaline. Additionally, it prompts the pituitary gland to release adrenocorticotropic hormone and β-endorphins into the bloodstream. This sequence of reactions to acupressure restores the body's energy flow and calms the upper gastrointestinal (GI) tract, resulting in a reduction of PONV (Seed, 2017).

Acupressure points located at the P6 point have been proposed as an effective preventive measure for PONV. Force per unit area the P6 point is situated 5 cm proximal to the ventral wrist crease, between the flexor carpi radialis and palmaris longus muscles. According to the theory of Traditional Chinese Medicine (TCM), surgery disrupts the body's natural balance by interfering with the flow of blood and qi, leading to an upward movement of qi in the stomach and resulting in feelings of nausea and vomiting. Stimulating the PC6 acupoints can potentially prevent nausea and vomiting by regulating the stomach's function and reducing the adverse flow of qi (Khan & Hadi, 2021).

2.11.1. Diaphragmatic breathing exercise :

The goal of relaxation techniques is to awaken the energy field and the right hemisphere of the brain, which processes emotions and the imagination. Deep breathing exercises are one relaxation method that might lessen the reaction to nausea and vomiting. One type of nursing care is the deep breathing technique. In this instance, the nurse instructs the patient on how to inhale deeply, exhale slowly, and take calm breaths while holding

inspiration to the maximum. Techniques for deep breathing can raise blood oxygen levels and enhance lung ventilation The deep breathing technique involves the deliberate and mindful act of breathing slowly and deeply. Voluntary contraction of the lower abdomen or abdominal region is an integral part of deep breathing techniques. This strategy focuses on the body's sensation by specifically detecting the airflow from the mouth or nose as it travels towards the lungs and then back along the same channel. The goal is to exclude inputs from other senses (Dewi, et al., 2021).

In respiratory physical therapy breathing techniques like diaphragmatic breathing can help increase lung expansion following surgery, it has proven to be able to reduce respiratory effort and improve ventilation efficiency. In diaphragmatic breathing, the upper chest mostly remains still while the abdomen rises during inspiration and expiration. Clients are usually encouraged to place their own hands on the belly and upper chest during diaphragmatic breathing exercises to see and/or tactilely confirm that their movements are acceptable (Yokogawa, et al., 2018).

2.11.2.The effect of diaphragmatic breathing exercise on nausea and vomiting:

Complementary therapy is an intervention strategy that can be used in addition to conventional medical treatment to manage nausea and vomiting, according to the National Center for Complementary and Integrative Health (2016). One easy, affordable, and safe technique for reducing anxiety and PONV is diaphragmatic breathing. It also requires little room, is simple to learn and practice, and has various benefits for the patient's condition. Even with the effectiveness of PONVR medication management, patients continue to encounter this problem. Non pharmacological techniques like practicing diaphragmatic breathing could combined with pharmacological treatment has the potential to decrease the likelihood of PONV (Ibrahim, et al., 2020).

The diaphragm has multiple physiological functions the vagus nerve which has an impact on several bodily parts, is linked to the phrenic nerve which controls the functioning of the diaphragm. The act of breathing via diaphragmatic motion has a direct and indirect impact on both the sympathetic and parasympathetic neural systems. Furthermore, it has an impact on the functioning of motor nerves and the size of the brain. The diaphragm regulates parturition, urine, bowel movements, and posture stability by controlling intra-abdominal pressure. Furthermore, its function is interconnected with the peritoneal lymphatic and circulatory systems, as well as with maintaining metabolic equilibrium. Diaphragmatic breathing (DB), also referred to as abdominal breathing, is a profound and deliberate breathing method that beyond mere regulation of breathing. Conventional forms of martial arts such as tai chi and yoga diaphragmatic breathing has an impact on the brain, cardiovascular system, respiratory system, and gastrointestinal system by altering autonomic nerve activity (Hamasaki, 2020).

The objective of relaxation techniques is to stimulate the energy field and the right hemisphere of the brain, which is responsible for processing emotions and creativity. Deep breathing exercises are a form of nursing care that can assist individuals in achieving relaxation and reducing their response to feelings of nausea and vomiting. These techniques have the potential to increase blood oxygen levels and improve lung ventilation. This strategy focuses on the body's sensation by specifically detecting the airflow from the mouth or nose as it moves towards the lungs and then back along the same channel. It aims to exclude inputs from other senses. Deep breathing techniques help alleviate nausea and vomiting by engaging the autonomic nervous system, which plays a vital role in regulating the peripheral sensory system responsible for maintaining internal balance. The cellular uptake of oxygen is enhanced following the implementation of this technique. This may reduce the quantity of lactic acid that is produced.

Furthermore, the state of relaxation not only induces a soothing effect but also elevates the levels of endorphins. Therefore, it reduces the stimulation of the vagal nerve in the belly and inhibits the Chemoreceptor Trigger Zone (CTZ) from functioning as a hub for the sensation of nausea and the act of vomiting (Dewi, et al., 2021).

2.12.Theoretical background

2.12.1The Dorthea theorist: Dorothea E. Orem

The theory being referred to is the Theory of Self-Care Deficit.

Orem states that the provision of nursing care entails the performance of professionally technical activities, these actions encompass case management, treatment or regulatory measures, prescriptive actions, and diagnostic procedures. Orem's idea can be implemented in various healthcare settings, including post-operative critical care units, ambulatory clinics, community settings, senior citizen homes, hospice care, and rehabilitation centers. Moreover, this idea can be applied to certain diseases or conditions, such as adult chronic illness, craniofacial trauma, arthritis, and cardiovascular problems. Furthermore, this idea is relevant to individuals belonging to a specific age group, encompassing newborns, pregnant women, and babies (Shah, 2015).

The great theory initially consisted of three interconnected concepts: the nursing systems theory, the self-care deficiency theory, and the self-care theory, the formulation of the fourth theory, dependent care theory, addressed the complex nature of caregiving for both the individual in need of assistance and the caregivers. The needs and abilities of the caregivers play a significant role in determining the structure and functioning of the nursing system (Marilyn, 2009).

Self-care refers to the deliberate and planned actions undertaken by individuals to maintain their physical and mental well-being, with the goal of sustaining life and optimal functioning. Self-care is an ongoing

practice that encompasses an individual's personal growth and development, health problems, energy levels and environmental factors (Eddings, 2012).

2.12.2:**Orem's theory of nursing have four constituent theory within self-care deficit nursing theory:**

1.Theory of self-care: focuses on the performance or practice of activities that individuals perform on their behalf. Those might be actions to maintain one's life and life functioning, develop oneself or correct a health deviation or condition. The central idea describes self-care in contrast to other forms of care. Self-care must be learned and be deliberately performed for life, human functioning, and well-being. However, there are situational variations that affect self-care such as culture. A person performing self-care must first estimate or investigate what can and should be done show in (figure 2.3) (Smith & Parker, 2015).

2.Theory of nursing system: which focuses on the relationship between a nurse and a client and the whole or partial compensatory nursing system and supportive-educative system that takes place between nurse and a person. The central focus is the product of nursing, establishing both structure and content for nursing practice as well as the nursing role. For example. Orem stated that "**Nursing has results-achieving operations that must be articulated with the interpersonal and societal features of nursing**. Although much of the theory relates to diagnosis, actions, and outcomes based on a deficit relationship between self-care capabilities and self-care demand. Orem also presents theoretical work related to the interpersonal relationship between nurse and person(s) receiving nursing and a social contract between the nurse and patient (Smith & Parker, 2015).

3.The dependent care theory: as a corollary to the theory of self-care. The theory of dependent care (TDC) has concepts that are similar to those in the theory of self-care. The essence of interpersonal action systems and social

dependence are assumptions. The self-care agent (the patient) is in a socially dependent relationship with the individual or persons providing care, such as a parent, within a specific social unit such as a family (the dependent-care agent). The emergence of a dependent's self-care deficiency necessitates the need for nursing care (Smith& Parker, 2015).

4.Theory of self-care deficit: the core theory explains why patients need nursing care. Nursing requirements are health-related restrictions on learning, determining, and producing self-care. Orem articulates this philosophy in two collections of presuppositions: the theory of self-care and what she refers to as the notion of social dependence. Persons who indulge in self-care must have the principles and skills to educate (to know), decide, and control themselves (to produce and regulate care). The second series of images depict nursing as a community facility for socially dependent patients (Younas, 2017).

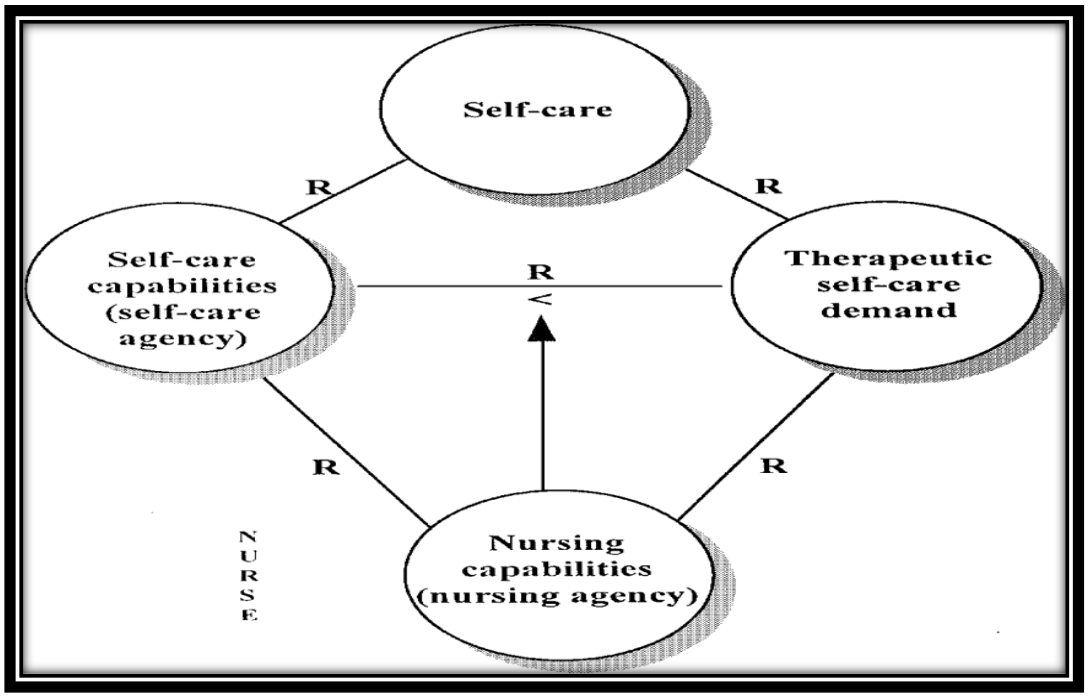
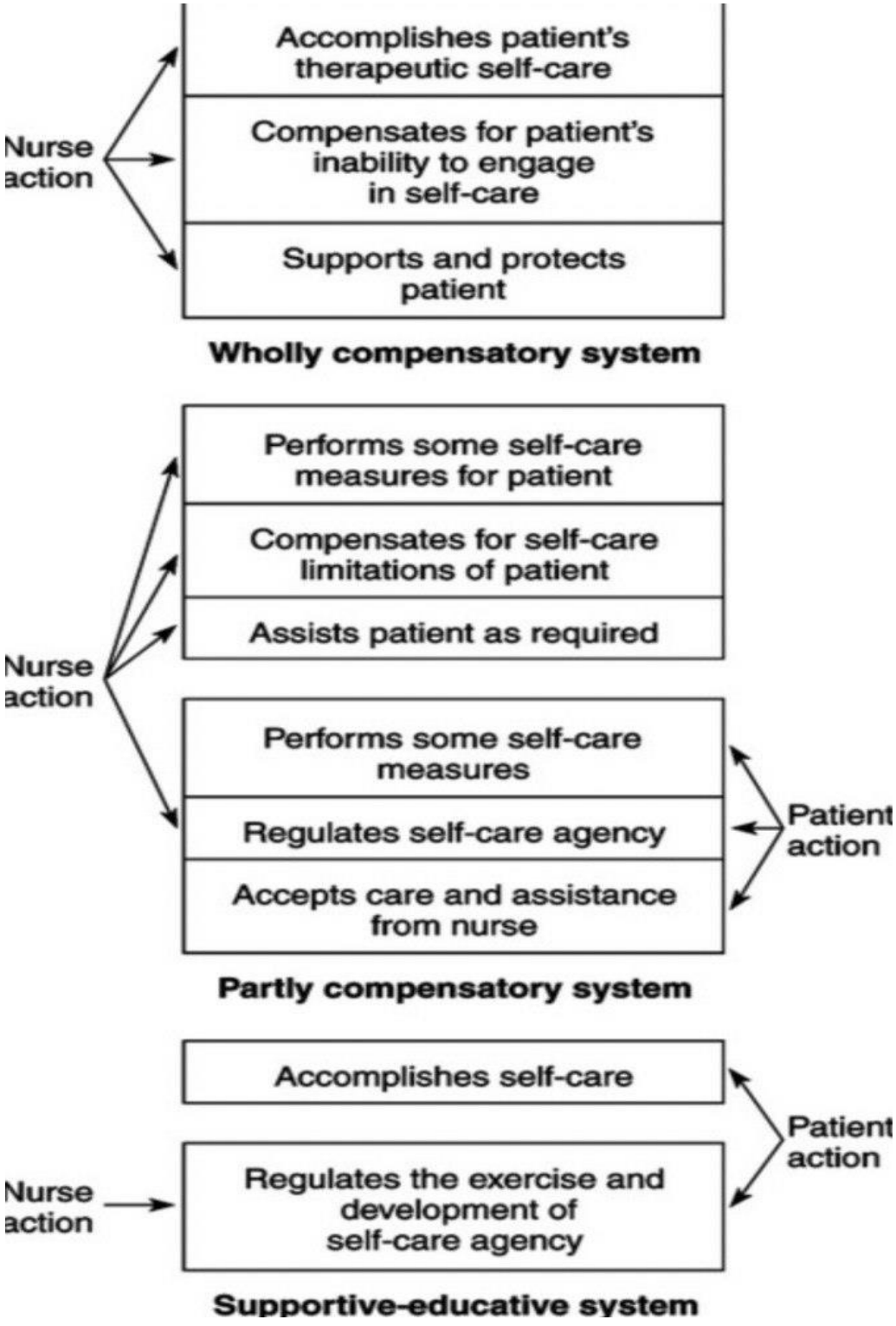


Figure (2.3) Orem's Theory of Nursing(Phillips and Morrow, 2010)

2.12.3.Nursing system

Orem describes a nursing system as an "action system," or actions and sequence of actions performed for a purpose. This is a composite of all the nurse's concrete actions completed or to be completed for or with a self-care agent to promote life, health, and well-being as illustrate in figure



Figure(2- 4) Nursing systems in self-care theory (Marilyn, 2009)

2.12.4.Application of Orem's theory through the nursing process (Nursing Theories, 2011):

Based on Orem’s theory, self-care theory, which has been created, taking into account the cholecystectomy patients in the current clinical study. The patient experienced a number of adverse effects as a result of the surgery one of the most common side effect nausea and vomiting, by the treatment received the patient's lead to prolonged recovery period and reduced the medication's efficacy. Application acupressure technique and breathing exercises to reduce nausea and vomiting following a cholecystectomy can help patients maximize their potential by managing their own emotions, motivation, and goals. as a result, patients can effectively achieve their rehabilitation goals.

The implementation of the self-care deficit is based on 3 main steps:

First Step: the investigator assesses and diagnoses patients to see if they need medical assistance. The study tool facilitates the initial stage by enabling the researcher to ascertain the clinical and demographic information of the cholecystectomy patients. Additionally, a visual analog nausea scale, the Rhodes index of nausea and vomiting, as well as retching postoperative nausea and vomiting, are utilized to quantify the levels of nausea and vomiting experienced by patients.

Second Step: Putting in place a nursing system and care delivery strategy; the researcher informs the participants about the program's duration (Melo ,et, al., 2020) of acupressure and diaphragmatic breathing exercises.

Third Step: Management of Nursing Systems: This involves organizing, carrying out, and overseeing nursing interventions, such as intervention and evaluation ,the researcher used an acupressure technique, which included sea bands and diaphragmatic breathing exercises, to solve the patient's problems, including the intensity of their nausea and vomiting, in the first

six hours following surgery, The second and third steps involved implementing Orem's theory, which is a clinical procedure based on the first step.

2.13. Previous study :

First study:

A quasi-experimental study conducted in Egypt, by Moustafa, et al., (2023) to examined the impact of deep breathing exercises on postoperative nausea, vomiting, and retching in orthopedic patients. The study involved eighty-four conscious adult participants who were under general anesthesia. The patients were categorized into two groups ,the study group and the control group, with each group consisting of forty-two individuals. The patient information form of the nausea, vomiting, index (INVR) tool was utilized for data collection. There was a significant difference in the overall INVR scores between the two groups after 6 hours ($p1 = 400.50$, $p < 0.001$) and after 12 hours ($U(p2) = 529.50$, $p < 0.001$). The outcomes of the study indicate that deep breathing exercises were shown to reduce nausea and vomiting in patients in the study group after six and twelve hours.

Second study :

Salamah, et al., (2023) performed a meta-analysis of randomized controlled trials conducted in Egypt aimed to investigate the effects of acupressure, non-pharmacology and noninvasive technique on nausea and vomiting after laparoscopic surgery .The study attracted attention occurred in two periods: the initial half, which included the first six hours afterwards; There were eleven trials in the 24-hour meta-analysis. 941 patients were included. Most of the included patients were female and undergoing laparoscopic cholecystectomy or gynecologic laparoscopy. acupressure significantly reduced nausea and vomiting at baseline and

long-term Acupressure effectively reduced the need for rescue anticonvulsants at both time points ($p < 0.05$).

Third study:

Dewi , et al.. (2021) conducted a quasi-experimental study in Indonesia to assess the effects of deep breathing relaxation techniques on vomiting and nausea in patients undergoing spinal anesthesia at the Central Surgical Installation. the study employed a two-group post-test design. The sample consisted of 16 participants, who were divided into two groups: the control group and the intervention group. A record sheet was utilized to document the reactions of each group to nausea and vomiting , the collected data were then analyzed using a T-independent analysis with a significance level of $p<0.05$. According to the data, the average incidence of nausea and vomiting in the intervention group was 0.12, whereas it was 0.50 in the control group. This study identified the impact by employing the T-test statistical analysis, yielding a p-value of 0.022 ($p > 0.05$).

Fourth study:

Eslami, et al., (2019).conducted a study in Iran to evaluate the efficacy of acupressure applied at pericardium 6 acupoints in reducing nausea and vomiting postoperative. In this randomized, single-blind clinical trial, a total of 70 patients were randomly assigned to either the intervention group or the control group. The intervention group securely attached the acupressure bands to the patient's wrist, aligning the snaps with the pericardium's 6 acupuncture points. The control group fastened the straps loosely and without any fasteners at the intended location, VAS , a linear scale ranging from 0 to 10 centimeters, to quantify the intensity and frequency of nausea and vomiting during the surgical procedure, as well as at 1, 3, and 7 hours post-surgery , with 0 indicating no nausea and 10 indicating the most severe nausea, analysis showed that the post-intervention values of the three variables in the intervention group were

significantly lower than those in the control group. To summarize, acupressure significantly reduced the severity and occurrence rate of postoperative nausea and vomiting episodes.

Fifth study:

Raghavendra,(2017) performed a randomized clinical study was undertaken in Bangalore to evaluate the efficacy of acupressure p6 in preventing postoperative nausea and vomiting in patients undergoing laparoscopic procedures randomly divided 100 patients into two groups , group A received acupressure at the P6 point, while group B, the control group, received acupressure at a different location. A group of individuals had the application of an acupressure band just before the administration of anesthesia. We classified occurrences of PONV into four categories: none, mild, moderate, or severe. These episodes were documented within specific time intervals: 0–2 hours, 2–6 hours, and 6–12 hours. Individuals experiencing a bout of vomiting received an antiemetic medication. The data were examined using the Student's t test, and a P value below 0.05 was deemed statistically significant. Acupressure could potentially be a suitable alternative to prevent PONV due to its non-invasive, non-pharmacological nature, affordability, and greater patient compatibility.

Sixth study:

Tan, et al., (2016) in a study to examine the effectiveness and safety of auricular point acupressure therapy for gastrointestinal dysfunction after laparoscopic cholecystectomy randomly assign the participants to either the auricular point acupressure group or the control group. There will be a total of six sessions for both the intervention and control groups. Each session will last for three minutes. The sessions will begin six hours after the surgery and will continue every twelve hours thereafter. We will conduct the initial evaluation six hours after the procedure, immediately preceding the first therapy session. Subsequently, there will be a total of seven

evaluations, with each one occurring at intervals of twelve hours. The main outcome measures are abdominal distension assessed using the Likert scale, as well as the presence of nausea and vomiting, use VAS to assess the individuals' postoperative nausea, the initial assessment will be conducted six hours following the surgical procedure, statistically significant P values are less than 0.05.

Seventh study:

Ebrahim, et al, (2011) Performed in Iran as a randomized, prospective, double-blind, and placebo-controlled to assess the effectiveness of acupressure wrist bands, ondansetron, metoclopramide, and placebo in preventing vomiting and nausea following strabismus surgery. The study divided a total of two hundred patients into four groups. Group I served as the control group, while Group II received a dosage of 0.2 mg/kg of metoclopramide. Group III received a dosage of 0.15 mg/kg of Ondansetron intravenously right before the induction. Group IV applied acupressure wristbands at the P6 points. Groups I, II, and III incorrectly positioned the acupressure wristbands. We administered the acupressure wrist bands 30 minutes before the administration of anesthesia and removed them six hours after the surgical procedure. We examined the data using the chi-square test. A P value less than 0.05 was considered statistically significant. There was no significant difference in the occurrence of PONV between the acupressure, metoclopramide, and ondansetron treatments. Applying acupressure at the P6 point leads to a notable decrease in the occurrence of PONV was similar when administered metoclopramide at a dosage of 0.2 mg/kg and ondansetron at a dosage of 0.15 mg/kg intravenously.

2.14. Literature synthesis:

Based on a review of previous studies, it is evident that combining non-pharmacological interventions with pharmaceutical therapy has a

favorable effect on managing PONV. Research has revealed that the application of acupressure to acupoint PC6 can effectively restore balance and enhance the functioning of the body's energy pathways. The P6 point is situated 5 cm proximal to the ventral wrist crease. applying pressure to this point stimulates the production of endorphins, which helps prevent PONV. Utilizing the diaphragmatic breathing exercise is an effective method for counteracting the physiological reactions of nausea and vomiting in patients. There is an expectation that health services will enhance their support for patients before surgery by implementing more proactive relaxing techniques. The aim is to reduce patient anxiety and reduce the likelihood of nausea and vomiting. Nausea and vomiting can lead to airway blockage, resulting in impaired oxygen intake to the lungs and significantly impacting the patient's condition. Both pharmaceutical and non-pharmacological approaches can manage nausea and vomiting, also use non-pharmacological behavioral techniques like diaphragmatic breathing exercises and acupressure. Utilizing both non-pharmacological and pharmacological methods is a highly effective approach to mitigating the occurrence of nausea and vomiting. When considering costs and benefits, non-drug management is more cost-effective and does not have any side effects, as opposed to drug management. Additionally, it has the potential to decrease the patient's reliance on medication.

Chapter Three

Methodology

Chapter Three

Methods and procedures

This chapter explain the study design , administrative arrangements , ethical consideration, setting of the study , method of sample selecting ,intervention protocol that used in the study , study instrument ,validity and reliability of the instrument , inclusion and exclusion criteria, as well as methods for data collection and data analysis.

3.1.The study design:

The current study utilized a quasi-experimental design, comparative study that conducted to investigate the effect of acupressure technique and diaphragmatic breathing exercises in reducing nausea and vomiting in cholecystectomy patients and to compare between the two interventions. This study was started from 26th September 2023 to 12th May 2024.

The researcher used the quasi-experimental design because there is no randomization in the present study.

3.2.Administrative agreements:

A formal request from the following institutions has been made for the permission to conduct the current study:

A. An official authorization was obtained from the Nursing College Council /University of Kerbala on 5th November 2023. Number 329 (Appendix A1).

B. An official authorization was obtained from the Ministry of Health/ Center of Human Development and Training/ Kerala Health Directorate on 13th November 2023 . Number 3252 (Appendix A2).

3.3.Ethical considerations:

Firstly, the researcher obtained an ethical agreement from the ethics committee in College of nursing / University of Kerbala to perform the present study on 5th November 2023 . Number 23.003 (Appendix B).

Additionally, they proceed to obtain the patients' consent to participate in the current study, ethical consideration is a fundamental principle in nursing research. The right to anonymity is guaranteed, and individuals are able to withdraw from the study at any point (Appendix F).

Clinical trial protocol for the Iranian registry of clinical trials (IRCT):

The research proposal received financial support from the IRCT with registration number IRCT20240111060680N1. Registration date: February 13, 2024 (Appendix P).

3.4. Setting of the study:

The study was conducted in Holy Kerbala City /Imam Al-Hussein medical city is the largest health institution which contain surgical ,medical and infectious disease wards contains 609 bed for inpatient . The surgical ward contains 65 bed for male and female wards. This study was also carried out at the Safer Al-Imam Al-Hussain Surgical Hospital in kerbala Governorate, which officially opened in 2010 and has an average of 100 bed, that provide health services like emergency and surgical wards.

3.5. Sample size:

It is necessary to compute an estimated effect size and power analysis in order to choose the sample size (Schmid,et al., 2018). The G*power calculator was used to determine the total number of participant (Faul,et al., 2009)was used to establish sample size for multiple regression analysis , a statistical power of 0.08,a confident level of 95%,and a probability level of 0.05 .The number of patient with cholecystectomy admitted to the Imam Al-Hussein medical city and Safer Al- Imam Al-Hussen Surgical Hospital during December (2021). January (2022), and February (2022) was 134 . A minimum sample of 100 participant was needed for confident level of 95%,power of 80% and a p (degree of variability) = 0.05. Therefore ,the final number of 100 participant was sufficient and additional participant were not recruited.

3.6.Sample of the study:

One hindered patient with cholecystectomy were included in the sample that was chosen ,and they were purposefully divided into three groups (acupressure technique group and diaphragmatic breathing exercise group) and another is control group. three patient excluded from study ,two patient don't have communication application . Five patient refuse to participant in study. Sample had been chosen using a non-probability (purposive non –random) sample involved ninety participant chosen from patient with cholecystectomy

Thirty patient with cholecystectomy were allocate as a control group , thirty patient were allocate to perform acupressure technique on PC6 and thirty patient were assigned to perform diaphragmatic breathing exercise.as shown in figure (3-1)

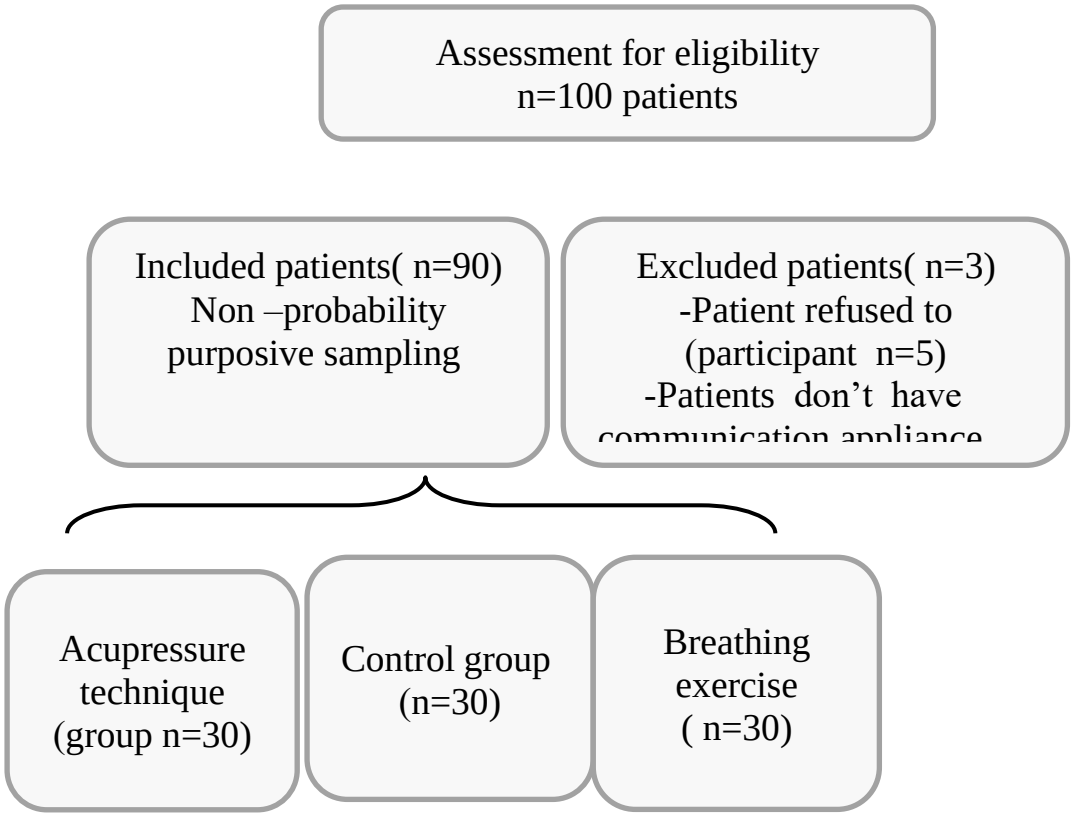


Figure (3.1): flowchart of eligibility criteria.

3.6.1. Inclusion criteria .:

1. A patient who was already diagnosed with laparoscopic cholecystectomy and was hospitalized experienced nausea and vomiting. Despite taken antiemetic.
2. The patient's age is either 18 or older.
3. Both sexes, male and female.

3.6.2.Exclusion criteria:

1. Patient who declined to participate in the research investigation.
2. Patient with a physical disability, unable to communicate
3. Patients who have amputations in the upper extremities.
4. Patients who have carpel tunnel syndrome.

3.7. Steps of the study:

The researcher relies on the following steps in the study:

3.7.1. Interventional strategy:

The researcher carried out these interventions after going over the educational references and previous research, and it was established to decrease the severity of nausea and vomiting in patient with cholecystectomy through the application of acupressure technique on PC6 and on other hand performing breathing exercise .The patient firstly instructed and trained about how to perform acupressure technique breathing exercise . One of the intervention group acupressure technique on PC6 with a wrist bands were used for this technique which are elastic wrist bands with a plastic button 1cm in diameter stud. The stud of wrist bands pressing upon PC6 acupoint, it is located on the anterior surface of the forearm about three finger width up from wrist crease .between the tendon of the palmaris longus and flexor carpi radialis (Appendix G).

The patient wear the wrist bands at pc6 bilaterally starting at 1 hour postoperative after recovery and continuing for 6 hours and press the band stud for three to five minute hourly. While another intervention

group perform diaphragmatic breathing exercise starting through inhale the nose slowly to take as much as possible amount of air ,while the mouth was closed and keep it on for few second paying close attention to the abdomen-hand movement with each breath while keeping the hand on the chest steady and then exhale slowly through the mouth. This exercise was performed for 3-5 min hourly for 6 hours Starting from 1 hour after recovery postoperatively.

3.7.2. Study instruments:

The instrument was selected in order to investigate the effects of the acupressure and diaphragmatic breathing exercise on nausea and vomiting in cholecystectomy patients and compare between intervention. Which consist of three section as explained below:

3.7.2.1. First section: socio-demographic and clinical data:

This part of instrument was regarding the participant socio-demographic and clinical data that include (age, gender, educational level, and occupational status, previous surgery, smoking and height, weight (Appendix D1).

3.7.2.2: Second section: Rhodes index for nausea and vomiting

This section of the instrument is focused on nausea ,vomiting and retching scale (RINVR) which developed by (Kim, et al,. 2007). It was used to assess the participant feeling of nausea and vomiting. Nausea and vomiting scale consist of eight related items (Appendix D2).

Arabic version was used and the translation was done by using the bilingual translation method, so that the Arabic version was used after measuring its validity and reliability.

3.7.2.3.Third section: visual analog scale VAS:

This section involved the nausea and vomiting postoperative that is developed by (Boogaerts, et al., 2000). This scale include scores given on 4-point verbal descriptive scale (VDS) (Appendix D3).

3.8.Verifying the instrument's validity:

The term validity indicated measuring what the instrument intended to measure (Taherdoost ,2016).

3.8.1.Face validity:

Indicate how much respondents find the test question and content to be relevant to the situation in which they are being implemented (Taherdoost ,2016). The Face validity is determined through the use of panel of experts to investigate clarity, relevancy, and adequacy of the questionnaire to measure the interested concepts. A draft of questionnaire is designed and presented to (15) experts, who have years of experiment more than 10 years in field of nursing and medicine. These experts are (3) from faculty member of college of nursing /University of Baghdad, (3) from faculty member of college of nursing /University of Kerbala, (3) from Kerbala Health Department Imam Hussain Medical City, (1) A member of the College of Nursing / University of Al-Ameed, (1) A member of the College of Nursing / University of Al-Safwaa, and (4) from faculty member of College of Nursing /University of Kuffa

The validity process conducted face to face manner through interview .This step include offering the domain of the item to the panel of the raters before submitting their evaluation of these items reviewer were asked to review the item completely, reviewers are asked to written comment to enhance comprehending and simplicity of each item .Also, the experts' suggestions have been taken into consideration. The study instrument has been accomplished to be valid tool to measure the study phenomena (Appendix E).

3.9. Pilot study :

The pilot study was included twelve patients, who are selected purposefully. These patients were surgically diagnosed with cholecystectomy treated at Imam Al-Hussein Medical City and Safer Al Hussein Surgical Hospital in Holy Kerbela City. The researcher collect data from participant through an interview at one time. The Pilot Study performed from 25 November 2023 to 5th December 2023.

3.9.1.The purpose of pilot study:

1. To examine the reliability of the research instrument.
2. Calculate the duration needed to gather data for each individual patient.
3. To assess the viability of responding to the questionnaire.
4. Assess the level of collaboration between the patient and the researcher.

3.9.2. Pilot study result:

1. Indicate that study instrument was clear and understandable .
2. The socio-demographic and clinical information section ,along with two scales, took between 15 and 20 minutes to complete.

3.10. Testing the reliability instrument:

Taherdoost, (2016), define reliability to the consistency of an assessment instrument's element reliability testing a for data collection with reliability being a key concern. The primary goal of a questionnaire in studies is to gather relevant data using the most precise and dependable method possible. Instrument dependability is the capacity to reliably replicate a result among various observers and across a significant period of time and space. The reliability measurement can be evaluated by many methods, including test-retest reliability (which assesses stability over time), internal consistency, and inter-rater reliability. These methods are used since there is a possibility

of measuring error in the respondents' responses (de Sa-capauto et al., 2020). Reliability refers to the extent to which a measurement of a phenomenon consistently produces the same result when repeated measurements are taken. In other words, if measurement is reliable, it will consistently yield consistent results, the researcher evaluates table (3-1) by analyzing the outcomes, it was determined that the questionnaire was both useful and well created. Additionally, the questionnaire demonstrated reliability in capturing the research phenomenon, demonstrates the reliability of a scale utilizing internal consistency, specifically alpha Cronbach .

Table (3.1) illustrates the Reliability of the Study Instrument.

Scales	**Actual Value Alpha (Cronbach α**	**Acceptable value**	**Assessment**
The Rhodes index (RINVR)scale	**0.92**	**0.70**	**Verified**

The findings suggest that the research tool is reliable in assessing the research phenomena within the same population at any point in the future.

3.11.Rating and scoring:

The researcher has adapted and developed an assessment tool based on existing scientific literature to study the effect of acupressure technique and diaphragmatic breathing exercise on nausea and vomiting in cholecystectomy patients, analysis comparing different aspects, the completed version of the research tool has subsequent components

3.11.1. Rating and scoring for body mass index:

Measurements of an individual's weight and height, and subsequently utilized a mathematical procedure to calculate the body mass index (BMI) is determined by dividing an individual's weight in kilograms by the square of their height in meters. Hughes' (2022) served as the basis for the BMI classification, the data is shown below:

1. Underweight=less than 18.5

2. Normal body weight between 18.5 - 24.9
3. Overweight about 25.0 - 29.9.
4. Obesity Class I between 30.0 - 34.9
5. Obesity Class II between 35.0 - 39.9
6. Obesity Class III more than 40

3.11.2.Rating and scoring Rhodes index for nausea and vomiting (RINVR):

Classified occurrences early postoperative symptoms such as nausea, vomiting, or retching may begin within 6 hours following surgery. RINVR assessment identified PONV episodes based on a total experience score greater than zero ,the subscales were divided into five point category scales, we established that each class had an interval equal to one-fourth of the maximum possible score, assigned a score of zero to the "none" category. The highest attainable score was 32. The scoring categories are as follows: The scale ranges from None (0) to Mild (1–8), Moderate (9–16), Severe (17–24), and Great (25–32).

3.11.3.Rating and scoring visual analogue scale (VAS)

This part is concerned to increase the efficiency and precision in the assessment of nausea and vomiting postoperative. Methods was evaluated by means of a classical VAS (0–10 cm) device and a 4-point the VAS were estimated as follows : 0– (No), 1–4 (Mild), 5–7 (Moderate) and 8–10 (Severe).

3.12.Data collection:

The data collection process by interview was utilize the researcher assesses the severity of nausea and vomiting using study instrument. The data was gathered between 7th December 2023 to 1st February 2024. It has been completed through a face to face interview by using an Arabic version of the questionnaire. The researcher need time (15- 20)minute to gathered data completely from each patient.

3.12.1. Assessment method:

After the patients' agreement was obtained, the assessment phase involves evaluating a patient for the presence of nausea and vomiting prior to implementing the acupressure technique and breathing exercise at pre-test in order to ascertain the extent and severity of the symptoms, also evaluated the patient's socio-demographic and clinical characteristics were assessed. Then post -test after 6 hour of implementing of acupressure and breathing exercise and control groups ,as the following step:

1. The participant were educated to response each question related to their status precisely and truthful ,also they will answer the same questionnaire after implementation the intervention .
2. Nausea and vomiting level was assessed using Rhodes index for nausea and vomiting postoperative scale before and after intervention protocol .
3. Measured the degree of nausea and vomiting using visual analog scale was evaluated both before and after the intervention regimen .

3.12.2.The implementation phase:

The researcher conducted the intervention by reviewing related references and previous research. The intervention aimed to decrease the severity for nausea, vomiting in patients with cholecystectomy by applying acupressure technique and diaphragmatic breathing exercises.

3.12.2.1. Acupressure technique intervention group:

The acupressure technique group involve thirty patient Imam Al-Hussein medical city at surgical ward. The researcher first assesses the severity of nausea and vomiting through interview for data collection each patient need approximately 15-20 minute to answer the questionnaire .subsequently the researcher teaching the patient to perform this technique each patient need approximately 5-7 minute to understood how wear the wrist band ,way and time to press the band stud (Appendix C1,C2).

The patient in this group wearing the wrist band bilaterally at pc6 acupoint it is located on the anterior surface of the forearm. Starting at 1hour postoperative after recovery and continuing for 6 hours and press the band stud for 3-5 minute hourly . The researcher assesses the severity of nausea and vomiting on six hour to determine the effect of this technique on both nausea and vomiting (Ebrahim, et al., 2011).

3.12.2.2. Breathing exercise intervention group:

Breathing exercise group include thirty patient in Safer Al -Hussein Surgical Hospital. The researcher need approximately 15-20 min for data collection and 5-10 min to teach the exercise to each the exercise for each patient. The patient was placed in the fowler position (which increases pulmonary expansion) and was taught to place one hand on the abdomen and the other hand on the chest perform diaphragmatic breathing exercise starting through inhale the nose slowly to take as much as possible amount of air ,while the mouth was closed and keep it on for few second paying close attention to the abdomen-hand movement with each breath while keeping the hand on the chest steady and then exhale slowly through the mouth for a few seconds in a circle shape block out all other sounds and ideas while being attentive and focused on the soothing words, images, and feelings, lower the motion of upper rib cage and primarily move the abdominal wall during inspiration with the operated region being supported (Ibrahim, et al., 2020).

The patient in this group were instructed to perform diaphragmatic breathing exercise for 3-5 min hourly for 6 hours Starting from 1hour after recovery postoperatively. The researcher again reassesses the severity of nausea and vomiting on six hour to determine the effect of this exercise on both nausea and vomiting (Appendix C3).

3.12.3:Patients follow up method:

3.12.3.1. Acupressure technique group follow up method:

During the period of acupressure wrist band intervention which continue for six hour postoperative. The participant were checked on by the researcher every hour during the first six hour post-operative remembered them to press the stud of wrist band and to instruct them to adherence to the protocol. Also, the researcher monitored the patient adherence to wear the wrist band and their response to the intervention.

3.12.3.2. Breathing exercise group follow up method:

During the period of breathing exercise implementation , the researcher checked on the patient every hour during the first six hour post-operative to encourage them to perform the exercise and to instruct them attached to the protocol . Furthermore, the researcher monitored the patient adherence and their response to the intervention.

3.12.3.3.The control group:

The control group consists of thirty patients at Safer Al-Imam Al-Hussein Surgical Hospital. The researcher did not administer any interventions to the participants. Instead, they conducted pre-test and post-test evaluations after six hours, similar to the other groups in the study. The results of this group will be compared to the results of the other groups. Subsequently, all participants in each group underwent a pre-test evaluation after one hours postoperative, post-test assessment after a period of 6 hours, using the RINVR index and the visual analog scale to assess the intensity of nausea and vomiting.

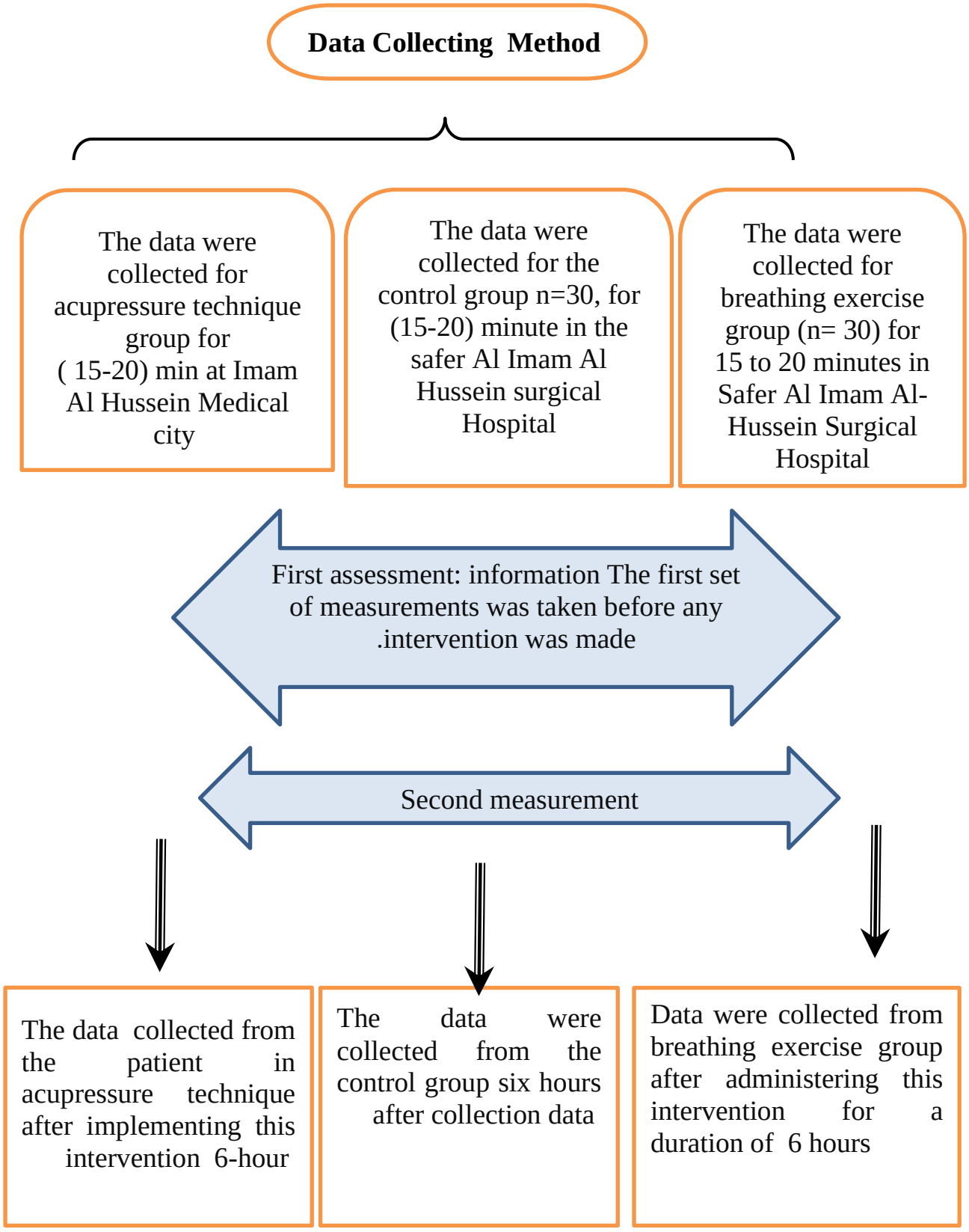


Figure (3-2) : Flowchart of the Data collecting method

3.13.Statistical analysis:

Data were analyzed by using program (SPSS) version 25, employed both descriptive and inferential data analysis methodologies, which are as follow:

3.13.1 Descriptive statistics analysis:

To determine overall finding of the sample and to compare the variables, tables were created using the frequency (f) , Percentage %; summary statistics including means of score (MS)& standard deviation (SD).

$\% = \frac{\text{ferequences}}{sample\ size} \times 100 = \% = \text{Percentage}$

Mean Scores: The mean of scores is used to assess patients nausea and vomiting

3.13.2. .Inferential statistics analysis:

The following method uses inferential statistics to test study hypotheses:

1. To assess the variation across groups the analysis of variance (ANOVA) statistic was used .
2. The paired sample t-test was to compare the mean level of nausea and vomiting in the same group before and after intervention .
3. To assess the difference in nausea and vomiting level between groups at pre-and post-test ,an independent sample t-test was used.
4. During the pre-test and post-test the statistical significance level is: The term "well-defined" refers to the probability of rejecting a null hypothesis when it is actually true (Nieswiadomy, 2012). A p-value of less than 0.05 was considered statistically significant.

3.14.Study limitations:

There are several important constraint that must be taken into account:

1. Sample size was small .because the study was carried out in only two hospitals, thus the generalization of the study result to different patients in other setting was difficult.
2. The study did not control for confounding variables, such as odors in post-anesthesia care units, that could potentially induce nausea.
3. Some patients refuse to participate in the diaphragmatic breathing exercise due to perceiving the program as challenging or experiencing issues such as pain at the incision site.
4. Some patients refuse to participate in the acupressure technique due to a lack of understanding about the technique and a belief that it may be harmful.

Chapter Four

Study Results and Findings

Chapter Four

Study Results and Findings

This chapter summarizes the findings of the data analysis that align with the previously stated objectives. The results are organized in the following manner:

***Table 4-1: Distribution of participants according to their demographic characteristics*:**

Socio-demographic characteristics		Control group		Acupressure group		breathing exercise group		p-value (Sig.)
		f	**%**	**f**	**%**	**f**	**%**	
Age	< 20 years	0	0	1	3.3	0	0	0.744 (NS)
	20- 39 years	13	43.3	16	53.3	16	53.3	
	40- 59 years	13	43.3	5	16.7	9	30.0	
	≥ 60 years	4	13.4	8	26.7	5	16.7	
	Mean	44		43		42.6		
	S.D	14.04		17.9		15.2		
	Total	30	100	30	100	30	100	
Sex	Male	7	23.3	7	23.3	5	16.7	0.227 (NS)
	Female	23	76.7	23	76.7	25	83.3	
	Total	30	100	30	100	30	100	
Educational level	Illiterate	5	16.7	5	16.7	7	23.3	0.359 (NS)
	Read and write	6	20.0	7	23.3	11	36.7	
	Primary school	13	43.3	7	23.3	7	23.3	
	Secondary school	1	3.3	5	16.7	2	6.7	
	Diploma degree	3	10.0	٠	٠	1	3.3	
	Bachelor's degree	2	6.7	6	20.0	2	6.7	
	Total	30	100	30	100	30	100	
Occupational status	Retired	1	3.3	0	0	0	0	0.635 (NS)
	Housewife	23	76.7	18	60.0	23	76.7	
	Government employee	4	13.4	9	30.0	5	16.6	
	Unemployed	1	3.3	2	6.7	2	6.7	
	Free business	1	3.3	1	3.3	0	0	
	Total	30	100	30	100	30	100	

f: frequency, %: percentage. S.D: standard deviation

Table 4-1 indicate that most patients in the control, acupressure, and breathing exercise were within age groups (20-39) years old accounted , 43.3% , 53.3% and 53.3% , respectively, and age group(40-59) years old accounted 43.3% for control 16.7% for acupressure and 30.0% for breathing groups (Appendix J).

Regarding sex groups , 76.7% of control and acupressure groups and 83.3% breathing exercise group were females (Appendix K).

This table also exposed educational levels of the patients were as fallowing: 43.3% of the control group and 23.3% of acupressure group were had primarily level of education, but 36.7% of breathing exercise group were read and write (Appendix L). This table also exposed that occupational status 60% of acupressure group were housewife while 76.7% of control and breathing exercise groups as well as (Appendix M). This table also indicates that all patients was distributing equally among three groups according all demographic characteristics because there is no statistical significant between them.

Table (4-2):Distribution of patient according to their clinical data:

Clinical data		Control group		Acupressure group		breathing exercise group		P-value
		f	**%**	**f**	**%**	**f**	**%**	
Past surgery	Yes	23	76.7	20	66.7	24	80.0	0.148 (NS)
	No	7	23.3	10	33.3	6	20.0	
Smoking status	Yes	7	23.3	12	40.0	6	20.0	0.447 (NS)
	No	23	76.7	18	60.0	24	80.0	
BMI	Normal	0	0	1	3.3	3	10.0	O.014 (S)
	Over weight	19	63.3	13	43.3	8	26.7	
	Obesity class I	9	30.0	10	33.3	13	43.3	
	Obesity class II	2	6.7	6	20.0	4	13.3	
	Obesity class III	0	0	0	0	2	6.7	

f: frequency, %: percentage. S.D: standard deviation

Table 4-2 indicate that for all patients enrolled in this study, the type of cholecystectomy was a laparoscopic surgery at a rate of 100% for three groups.76.7%, 66.7%, and 80% of control, acupressure, and breathing exercise groups, respectively had past surgery. All patient were given anti-emetics at percent of 100% for three groups. Most of the patients were nonsmokers at 76.7%, 60%, and 80% of the control, acupressure, and breathing exercise groups, respectively. Also 63.3% of patients in the control group had overweight, 43.3 % in the acupressure group, and 43.3% of breathing exercise group were suffering from obesity class I. Finally, this table indicates that all patients was distributing equally among three

groups according all clinical data, because there is no statistical significant between them except BMI, due to there is a statistical significant between three groups among BMI categories at p value of (0.014).

Table 4-3: Levels of nausea and vomiting among patients with cholecystectomy using RINVR scale:

Levels	Control group				Acupressure group				breathing exercise group			
	Pretest		Posttest		Pretest		Posttest		Pretest		Posttest	
	f	%	f	%	f	%	f	%	f	%	f	%
None	0	0	0	0	1	3.3	0	0	0	0	3	10
Mild	6	20.0	23	76.7	7	23.3	29	96.7	9	30.0	23	76.7
Moderate	16	53.3	4	13.3	14	46.7	1	3.3	10	33.3	3	10.0
Severe	6	20.0	3	10.0	5	16.7	0	0	6	20.0	1	3.3
Great	2	6.7	0	0	3	10.0	0	0	5	16.7	0	0

None: 0, mild: 1-8, moderate: 9-16, severe: 17-24, and great: 25-32.

Table (4-3) exposed that the patients in control group, acupressure group, and breathing exercise group had moderate level of nausea and vomiting one hour post operatively at percent of 53.3%, 46.7%, and 33.3% respectively. After six hours the second test exposed that the patients in three groups had mild level of nausea and vomiting at percent of 76.6%, 96.7%, and 76.7% respectively.

Table 4-4: levels of nausea and vomiting among patients with cholecystectomy using VAS :

Levels	Control group				Acupressure group				breathing exercise group			
	Pretest		Posttest		Pretest		Posttest		Pretest		Posttest	
	f	%	f	%	f	%	f	%	f	%	f	%
None	0	0	2	6.7	2	6.7	29	96.7	0	0	19	63.3
Mild	9	30.0	20	66.7	8	26.7	1	3.3	9	30.0	4	13.3
Moderate	17	56.7	4	13.3	13	43.3	0	0	14	46.7	5	16.7
Severe	4	13.3	4	13.3	7	23.3	0	0	7	23.3	2	6.7

None: 0, mild: 1-4, moderate: 5-7, and Severe: 8-10.

Table 4-4 exposed that patients in the control group, acupressure group, and the breathing exercise group had moderate level of nausea and vomiting one hour post operatively at percent of 56.7%, 43.3%, and 46.7% respectively. After six hours the second test exposed that the patients in the

control group had mild level of nausea and vomiting at percent of 66.7%, while 96.7% of patients in acupressure group and 63.3% in breathing exercise group had no nausea and vomiting.

Table 4-5:Comparison between pretest and posttest of nausea and vomiting status among patients with cholecystectomy using RINVR Scale:

Group		***Mean***	***S.D***	***Paired Samples Test***		
				t	***p- value***	***Sig.***
Control group	*Pretest*	3.13	0.819	-1.252	0.068	S
	Posttest	2.33	0.661			
Acupressure group	*Pretest*	3.07	0.980	-11.549	0.000	S
	Posttest	1.03	0.183			
breathing exercise group	*Pretest*	3.23	1.073	-7.347	0.000	S
	Posttest	1.40	0.814			

S.D: standard deviation, t: Paired Samples t Test, Sig.: significance

This table revealed that there is significant between pretest and posttest of nausea and vomiting status among patients with cholecystectomy in all three groups as fallowing: in control group the t value = (-1.252) at p- value of (0.068) and in acupressure group the t value = (-11.549) at p- value of (0.000), finally in breathing exercise group the t value = (-7.347) at p- value of (0.000).

Table 4-6: Comparison between pretest and posttest of nausea status among patients with cholecystectomy using VAS

Group		***Mean***	***S.D***	***Paired Samples Test***		
				t	***p- value***	***Sig.***
Control group	*Pretest*	2.33	.802	-1.412	0.074	S
	Posttest	2.83	.648			
Acupressure group	*Pretest*	2.83	.874	-11.641	0.000	S
	Posttest	1.03	.183			
breathing exercise group	*Pretest*	1.67	.994	-5.774	0.000	S
	Posttest	2.93	.740			

S.D: standard deviation, t: Paired Samples t Test, Sig.: significance

Table (4-6) exposed that there is significant between pretest and posttest of nausea and vomiting status among patients with cholecystectomy in all three groups as fallowing: in control group the t

value = (-1.412) at p- value of (0.074) and in acupressure group the t value = (-11.641) at p- value of (0.000), finally in breathing exercise group the t value = (-5.774) at p- value of (0.000).

Table 4-7: Differences in posttest about nausea and vomiting status among patients with cholecystectomy in three groups:

Scale	Control group		Acupressure group		breathing exercise group		One way ANOVA test		
	Mean	S.D	Mean	S.D	Mean	S.D	F	p-value	Sig.
RINVR scale	2.33	.661	1.13	. 354	1.40	.814	35.713	0.000	S
Visual Analog Scale	2.33	.802	1.03	.183	1.67	.994	22.836	0.000	S

S.D: standard deviation, f: One way ANOVA test, Sig.: significance

Table (4.7) shows that there is a disparity in the level of nausea and vomiting among patients in the three groups and by using both scales, as follows: by using RINVR scale this table exposed that f value was (35.713) at p value of (0.000), also by using Visual Analog Scale for Nausea f value was (22.836) at p value of (0.000)

Table (4-8): Comparisons between differences of nausea and vomiting status among patients with cholecystectomy in three groups:

Scale	Comparison between groups		Mean of groups		Mean Difference (I-J)	p-value	Sig.
	I	J					
RINVR scale	Control group	Acupressure group	Control	**2.33**	1.300	0.000	S
			Acupressure	**1.13**			
	Control group	Diaphragmatic breathing exercise group	Control	**2.33**	0.933	0.000	S
			Diaphragmatic	**1.40**			
	Acupressure group	Diaphragmatic breathing exercise group	Acupressure	**1.13**	0.367	0.075	NS
			Diaphragmatic	**1.40**			
Visual Analog Scale for Nausea	Control group	Acupressure group	Control	**2.33**	1.300	0.000	S
			Acupressure	**1.03**			
	Control group	Diaphragmatic breathing	Control	**2.33**	0.667	0.004	S

		exercise group	Diaphragmatic	**1.67**			
	Acupressure group	Diaphragmatic breathing exercise group	Acupressure	**1.03**	0.633	0.006	S
			Diaphragmatic	**1.67**			

Table (4-8) revealed that there are differences in the level of nausea and vomiting between patients in the three groups, using both scales, which shows that there is a noticeable improvement in the level of nausea and vomiting in one group at the expense of the other, as follows: by using RINVR scale, this table exposed that the mean difference between control and acupressure group was (1.300) at p value of (0.000) that mean the level of nausea and vomiting of patients in acupressure group best than they are in control group this is clear from the mean of (2.33) and (1.13), respectively.

The mean difference between control and diaphragmatic breathing exercise group was (0.933) at p value of (0.000) that mean the level of nausea and vomiting of patients in diaphragmatic breathing exercise group best than they are in control group this is clear from the mean of (2.33) and (1.40), respectively. Finally, the mean difference between acupressure and diaphragmatic breathing exercise group was (0.367) at p value of (0.075), this means that there is no clear difference in the level of nausea and vomiting in patients in both groups.

Also this table exposed that by using Visual Analog Scale there was an improvement in the level of nausea and vomiting in one group more than the other, as follows: the mean difference between control and acupressure group was (1.300) at p value of (0.000) that mean the level of nausea and vomiting of patients in acupressure group best than they are in control group this is clear from the mean of (2.33) and (1.03), respectively.

The mean difference between control and diaphragmatic breathing exercise group was (0.667) at p value of (0.004) that mean the level of

nausea and vomiting of patients in diaphragmatic breathing exercise group best than they are in control group this is clear from the mean of (2.33) and (1.67), respectively. The mean difference between acupressure and diaphragmatic breathing exercise group was (0.633) at p value of (0.006) that mean the level of nausea and vomiting of patients in acupressure group best than they are in diaphragmatic breathing exercise group this is clear from the mean of (1.03) and (1.67), respectively, as shown in (Appendix L) (Appendix M).

Table 4-9: Association between the effect of acupressure technique on nausea and vomiting with patient socio-demographic characteristics and clinical data.

Demographic characteristics and clinical data		***Mean***	***S.D***	***One way ANOVA test***			
				f	***df***	***p- value***	***Sig.***
Age	< 20 years	1.00	.000	٠.270	3	0.847	NS
	20- 39 years	1.06	.250				
	40- 59 years	1.00	.000				
	≥ 60 years	1.00	.000				
Educational level	Illiterate	1.00	.000	٠.799	4	0.537	NS
	Read and write	1.00	.000				
	Primary school	1.14	.378				
	Secondary school	1.00	.000				
	Diploma degree	1.00	.000				
	Bachelor's degree	1.00	.000				
Occupational status	Retired	0	.000	٠.204	3	0.893	NS
	Housewife	1.06	.236				
	Government employee	1.00	.000				
	Unemployed	1.00	.000				
	Free business	1.00	.000				
BMI	Normal	1.00	.000	1.387	3	٠.269	NS
	Over weight	1.00	.000				
	Obesity class I	1.00	.000				
	Obesity class II	1.17	.408				
	Obesity class III	1.00	.000				
				Independent Samples Test			
				df	***t***	***p- value***	***Sig.***
Sex	Male	2.43	.787	58	0.429	0.671	NS
	Female	2.30	.635				

Past surgery	Yes	2.40	.754	28	0.976	0.044	S
	No	2.20	.422				
Smoking status	Yes	2.42	.669	28	0.557	0.582	NS
	No	2.28	.669				

S.D: standard deviation, f: One way ANOVA test, Sig.: significance, df: degree of freedom

This table indicates that there is no statistically significant association between the effect of acupressure technique on the nausea and vomiting with various categories of demographic characteristics and clinical data (age, educational level, occupational status, BMI, sex, and smoking status). This means that all patients and within all categories of demographic characteristics and clinical data benefited from acupressure therapy in reducing the level of nausea and vomiting.

There is a significant association between the effect of acupressure technique on the severity of nausea and vomiting and the patient's past surgery that clear through t value (0.976) and p- value (0.044) This means that patients who had past surgery benefited from the acupressure therapy in reducing the level of nausea and vomiting more than those who had not past surgery.

Table 4-10: Association between the effect of breathing exercise on nausea and vomiting with demographic characteristics and clinical data of patients:

Demographic characteristics and clinical data		***Mean***	***S.D***	***One way ANOVA test***			
				f	***df***	***p- value***	***Sig.***
Age	< 20 years	٠	0	٠.570	2	٠.572	NS
	20- 39 years	1.25	.577				
	40- 59 years	1.56	1.130				
	≥ 60 years	1.60	.894				
Educational level	Illiterate	1.29	.488	1.628	5	٠.191	NS
	Read and write	1.91	1.136				
	Primary school	1.00	.000				
	Secondary school	1.00	.000				
	Diploma degree	1.00	٠				
	Bachelor's degree	1.00	.000				
Occupational	Retired	0	.000	1.112	2	0.344	NS

status	Housewife	1.52	.898				
	Government employee	1.00	.000				
	Unemployed	1.00	.000				
	Free business	.00	.000				
BMI	Normal	1.67	1.155	0.273	4	٠.893	NS
	Over weight	1.25	.463				
	Obesity class I	1.46	.967				
	Obesity class II	1.50	1.000				
	Obesity class III	1.00	.000				
				Independent Samples Test			
				df	***t***	***p- value***	***Sig.***
Sex	Male	1.00	.000	28	1.214	0.235	NS
	Female	1.48	.872				
Past surgery	Yes	1.29	.624	28	١,٤٨٩	0.148	S
	No	1.83	1.329				
Smoking status	Yes	1.00	.000	28	1.366	0.183	NS
	No	1.50	.885				

S.D: standard deviation, f: One way ANOVA test, Sig.: significance, df: degree of freedom

This table indicates a non- statistically significant association between the effect of breathing exercise on nausea and vomiting with socio demographic characteristics and clinical data (age, educational level, occupational status, BMI, sex, past surgery, and smoking status). This indicates the diaphragmatic breathing exercise helped all patients, without any variation in improvement; reduce their degree of nausea and vomiting, regardless of the categories of demographic features and clinical data.

Chapter Five

Discussion,Conclusions and Recommendations

Chapter Five

Discussion ,Conclusion and Recommendation

This chapter will provide a well-structured discussion that provide a systematic interpretation of the finding from chapter four, supplemented by recent research in patients having cholecystectomy are increased risk for vomiting and nausea. It is possible to control and reduce the severity of these problem to Improve patient health condition. 90 male and female patients who were confirmed to have cholecystectomy patient , in this study to examine the effect of acupressure and diaphragmatic breathing exercise and compare between these interventions.

5.1.Discussion of socio-demographic data of patient's:

The participants characteristics in the present study indicate that most patient in the control, acupressure, and breathing exercise groups were within the age group (20-39) years old and accounted , 43.3% , 53.3% and 53.3% respectively, and the age group (40-59) years old accounted (43.3%, 16.7%, 30.0%) for control, acupressure technique and breathing groups respectively, this result consisted with the result of a randomized control trail that was conducted by Karagoz&Sayila (2023) in patient undergoing laparoscopic cholecystectomy ,founding the age range was from 21 to 82 years old with a mean age of 51.59 ± 13.39.Other previous study conducted by Radunovic, et al., (2016), found a median age of patients undergoing laparoscopic cholecystectomy ranging from 16 to 98 years old.

Regarding the sex group, this study explains that 76.7% of control and 76.7% for acupressure group and 83.3% of breathing exercise group were female, this finding come along with the result of the study performed by Çakmak, et al., (2022), to investigate the effect of acupressure application on postoperative nausea and vomiting in

laparoscopic cholecystectomy which indicate that about 84.0% of patient in the study were female.

The researcher opinion about these results was consist to the fact the risk to cholecystectomy incidence and prevalence were higher in women than men. A previous study conducted by Al-Hayali, (2021). Which explore the incidence cholecystectomy were in female patients higher than male .

Concerning educational levels of the participants in this study were as fallowing: 43.3% of control group and 23.3% were had primarily school of acupressure group, but 36.7% were read and write for breathing exercise groups. Farhadi, et al., (2016) conducted a randomized controlled trial to investigate the effectiveness of the P6 acupoint in preventing PONV reported that the majority of participants in both the experimental and control groups had completed their primary school.

Regarding to the patient occupational , 60% of acupressure group were housewife while 76.7% of control and breathing exercise group as well as. This result goes beyond a randomized controlled trail that was conducted by Eslami, et al., (2019) to expose the effect of acupressure on nausea and vomiting after general surgery. The study result show that about 40% of patient in the intervention group and about 31.4% in the control group were housewife.

Finally, this study indicates that all patients was distributing equally among three groups according to all demographic characteristics, because there is no statistical significant between them at p-value >0.05, agree with this result conducted by Moustafa, et al., (2023) to investigate the impact of deep breathing exercise on postoperative nausea and vomiting found that there was no statistically significant distinction between the control and experimental groups in terms of the selected demographic characteristics.

5.2. Discussion of patient's clinical data:

The result in the table 4-2 indicate that are all of patient in this study have elective laparoscopic cholecystectomy and accounted of 100% for three groups, these finding are directly in line with the result of the study that was conducted by Kurtulus, et al., (2022) indicate laparoscopic cholecystectomy offers several advantages over the open technique, including a shorter operation time, a shorter postoperative hospital stay and a lower complication rate.

Concerning to the past surgery 76.7%, 66.7%, and 80% of patients in the control, acupressure, and breathing exercise groups respectively, have past surgery. This result consist with the result of the study conducted by Imani, et al., (2024) a randomized controlled trial to compare the benefits of acupressure and aromatherapy using peppermint essential oil on the quality of recovery in patients undergoing laparoscopic cholecystectomy exposed they are no statistically significant changes were observed as indicated by a p-value greater than 0.05 when evolution of surgical procedures.

The findings of our study were revealed that all sample members in each of the three groups were administered anti-emetics at a rate of 100%. A study that was done by Elvir, et al., (2020) stated that management strategy for administering antiemetic medications for the treatment and prevention PONV in cholecystectomy patient.

The majority of patients in the control, acupressure, and breathing exercise groups were nonsmokers, with percentages of 76.7%, 60%, and 80% respectively, the result of the study accompanied by Shrestha, et al., (2021) revealed that almost patients (70%) were nonsmokers, where as 30% were smokers, out of the nonsmokers patient had PONV, more than smokers.

Regarding the BMI of patients the result in this study reveal that (63.3%) of patients in the control group were overweight, although (43.3%) in the acupressure group, and 43.3% of breathing exercise group were suffering from obesity class I. This table indicates that all patients was distributing equally among three groups according all clinical data, because there is no statistical significant between them except BMI, due to there is a statistical significant between three groups among BMI categories at p value of (0.014). A study conducted by Unlue & Kaya (2018) stated that around 43.26% of patients who received intervention acupressure were overweight, while roughly 40.83% not receive intervention obesity class I. p-value 0.022.

The researcher opinion excess weight or obesity raises the likelihood of developing gallstones, which might result in the need for cholecystectomy surgery. This result consist with the result of the study conducted by Hendarto, et al., (2023) stated obesity one of risk factors can lead to the formation of gallstone through various mechanisms.

5.3.Discussion the severity of nausea and vomiting for patients with cholecystectomy using RINVR and VAS scale:

Regarding the severity of nausea and vomiting for patients enrolled in the acupressure , breathing exercise and control groups. The results in table 4-3 by using RINVR scale show the severity of nausea and vomiting of patients among these groups before the application of intervention protocol. All patient in the three groups at pre-test one hour post operatively experienced a moderate level of nausea and vomiting ,with percentages of 53.3%, 46.7%, and 33.3% in control, acupressure, and breathing exercise groups, respectively. After a duration of six hours, the second test indicated that the patients in these groups experienced mild level of nausea and vomiting with percentages of 76.6%, 96.7%, and 76.7%, in control, acupressure, and breathing exercise groups , respectively. This

study's findings are consistent with a study conducted by Putra, et al., (2021) in Australia, to assess the efficacy of utilizing an acupressure wristband at the Neiguan Point (P6) in reducing PONV in orthopedic surgical patients ,the RINVR questionnaire was used, the findings indicated that 63.2% of individuals experienced moderate nausea and vomiting prior to receiving any treatments for PONV. After receiving the intervention a significant number of individuals had mild nausea, with statistical significance. Also the findings of study that done by Sembiring, et al., (2020) a quasi-experimental study demonstrated acupressure is one way to treat vomiting nausea in patients receiving chemotherapy. with a total of 70 respondents consisting of 35 control groups and 35 intervention groups selected , data collection method was carried out using the RINVR instruments, There were differences to vomiting and nausea in the control group and the intervention group ($p = 0.064$; $p = 0.000$) vomiting and nausea can decrease after acupressure technique intervention apply.

The current study findings align with the results of a study done by Hamasaki, (2020) in Japan to investigated the impact of diaphragmatic breathing on health. The results indicated that deep breathing (DB) enhanced the activity of the parasympathetic nervous system, reduced the rate of respiration, and alleviated symptoms of motion sickness, such as a decrease in the occurrence of nausea and vomiting. The ratings in the DB group were markedly lower compared to those in the control group (1.37 _ 0.44 vs. 1.78 _ 0.63).

Regarding the severity of nausea and vomiting for patients enrolled in the acupressure , breathing exercise and control group. The result in table 4-4 using VAS show the severity nausea and vomiting patients among these groups before the application of intervention protocol. All patients in three groups had a moderate level of nausea and vomiting at the pre-test assessment during one hour after the operation at percentages of 56.7%, 43.3%, and 46.7% in control, acupressure, and breathing exercise

groups, respectively, after a duration of six hours the second test revealed that the patients in the control group experienced a mild level of nausea and vomiting at a rate of 66.7%. In contrast 96.7% for patients in acupressure and 63.3% in breathing exercise did not experience any nausea and vomiting during the posttest assessment. These result go beyond previous study result conducted by Abdelhak, et al., (2024) to investigate the effect of acupressure on nausea and vomiting post-operative in cesarean section, forty-eight patients who are diagnosed with moderate severity of nausea and vomiting were assigned randomly into 2 equal groups, tool used to measured data by VAS, also less degree of nausea and vomiting in patient after performing acupressure($p<0.05$) in comparison to patient in the control group .

5.4.Discussion the effect of acupressure on nausea and vomiting status among patients with cholecystectomy :

The result in table (4-5) by used the RINVR scale indicate that significant difference between pretest and posttest of nausea and vomiting level among patients in control group the t value=(-4.252) at p- value of (0.048) and in acupressure group the t value=(-11.549) at p- value of (0.000) demonstrating that performing the acupressure technique on PC6 for 3-5 minutes every hours continuously for 6 hours postoperative effectively reduce nausea and vomiting for patient with cholecystectomy. These result consisted with the result an quasi-experimental study conducted by Basuony, et al., (2022) to evaluate effect of implementing acupressure technique on gastrointestinal problems for children post abdominal surgeries. Tools were used to collect data RINVR and VAS to assess nausea and vomiting of patient. Stated acupressure intervention were significant improvement among children's undergoing nausea, vomiting, after abdominal surgeries. Also, the findings of study that done by Jin, et al., (2020) indicate that acupressure as a non-pharmacological interventions

given with pharmacological therapy and had a positive effect on the prevention and treatment of PONV.

The result as shown in table (4-6) by using VAS exposed that there is significant between pre-test and post-test of nausea and vomiting status among patients in control group the t value = (-2.812) at p- value (0.044) and in acupressure group the t value = (-11.641) at p- value (0.000). This mean that implementing acupressure technique effectively reduced severity of nausea and vomiting . These results go beyond with previous study a randomized, single-blind, placebo-controlled study done by Afshar, et al., (2023) conducted in Iran to investigation the effects of acupressure technique performed P6 point in patients with myocardial infarction had nausea, vomiting. Which tool used to collect data was VAS were randomly assigned to three groups (acupressure group, placebo group, and control group) after application the acupressure group was significantly less than that done in the placebo and control groups ($P < 0.05$). The results illustrated that p6 acupressure reduces nausea, vomiting, and retching and increases the comfort level in patients. Furthermore, it can diminish the need for anti-vomiting drugs in these patients.

Çakmak, et al., (2022) conducted in Turkey to determine the effect of the timing of acupressure application to p6 on postoperative nausea and vomiting in laparoscopic cholecystectomy, included 150 adults patients were randomly assigned to three groups of 50 patients. While the acupressure wristband was applied to the patients in group 1 before anesthesia induction, the wristbands were applied to group 2 and group 3 after anesthesia induction and at the end of the surgery, respectively, the incidence and severity of nausea/vomiting were recorded by VAS**.** The lowest median nausea score was found in group 2, which significantly differed from group 3 ($p= 0.046$), but not from group 1. This was also the case for the need for antiemetic therapy ($p= 0.021$) ,although show that

acupressure is effective in decreasing postoperative nausea and vomiting and the need for antiemetic agents in the early period.

The researcher suggests that stimulating PC6 elevate the endorphin level which may enhance the impulses between vomiting center and stomach because acupoint connect with the vomiting center and stomach at leading to relaxing stomach muscle and improve gastrointestinal motility. Sulistyarini, et al., (2023) indicate that stimulation the he PC6 can increase the beta endorphins in the pituitary which can be a natural antiemetic through its work to reduce nausea and vomiting impulses in the Chemoreceptor Trigger Zone (CTZ) and vomiting center. Furthermore, Arslan & Çelik (2023) exposed acupressure, a non-pharmacological and non-invasive nursing intervention, effectively decrease postoperative nausea and vomiting.

5.5.Discussion the effect of diaphragmatic breathing exercise nausea and vomiting among patients with cholecystectomy:

Regarding the effect of diaphragmatic breathing exercise nausea and vomiting, the result exposed a significant difference between pretest and posttest of nausea and vomiting status as shown in table (4-5) by used RINVR scale in control group the t value = (-1.252) at p- value (0.068) in breathing exercise group the t value=(-7.347) at p- value (0.000). Furthermore, as shown in tables (4-6) a significant difference between pretest and posttest of nausea and vomiting status in control group the t value = (-1.412) at p- value (0.074) and in breathing exercise group the t value=(-5.774) at p- value (0.000).Therefore ,this indicate the implementing diaphragmatic breathing exercise was significantly alleviating the nausea and vomiting in patients with cholecystectomy**.** Conversely ,not implementing diaphragmatic breathing exercise was significantly increase the severity of nausea and vomiting . This finding is similar pattern of result was obtained by Bulut & Karabulut, (2023) used a randomized control trail

to investigate the impact of breathing exercises on patients who have undergone laparoscopic cholecystectomy, specifically in term of anxiety level, sleep pattern , and post-surgical recovery quality include nausea and vomiting . The statistical analysis yielded a significant result with a p-value of less than 0.05.Also consist with the result that was done by Dewi , et al., (2021) conducted a study in Indonesia to determine the effect of deep breathing exercises on patient nausea and vomiting receiving spinal anesthesia. The result stated that in the experimental group before implementing breathing exercises M+_SD for nausea and vomiting was (0.75+- 0.46), while after the intervention M+_SD (0.12+_ 0.35) with the T-test, p-value 0.022 (p>0.05). Also consist with the result of the study that was done by Mustafa, et al., (2023) conducted a quasi-experimental study performed in Egypt , to investigate the effect of deep breathing exercises on orthopedic surgery patients postoperative nausea, vomiting, and retching. The result show a significant difference was found among the two group concerning each item of index of nausea, vomiting, and retching (INVR), founded highly significant with a p-value 0.001.

The researcher expected that after performing diaphragmatic breathing exercise the blood circulation and cell saturation improved leading to decrease oxygen demand decreasing the lactic acid level which relaxed and relieve nausea and vomiting Yokogawa, et al., (2018) stated that there is an increased oxygen supply into cell following the implementation of this technique, as a result reduce the quantity of lactic acid may be produced. Furthermore, the state of relaxation response can also elevates the levels of endorphins. Therefore, it reduces the stimulation of the vagal nerve in the belly and inhibits the chemoreceptor trigger zone (CTZ) from functioning which serves as a center for nausea and vomiting.

5.6:Discussion the comparisons of the effect of acupressure and diaphragmatic breathing exercise on nausea and vomiting :

The result in table (4-7, 4-8) indicated that there are differences in the level of nausea and vomiting between patients in the three groups, using both scales, which shows that there is a noticeable improvement in the level of nausea and vomiting in one group at the expense of the other, as follows: by using RINVR scale, this table exposed that the mean difference between control and acupressure groups was (1.300) at p value of (0.000) that mean the level of nausea and vomiting of patients in acupressure group best than they are in control group this is clear from the mean of (2.33) and (1.13), respectively. The mean difference between control and diaphragmatic breathing exercise group was (0.933) at p value (0.000) that mean the level of nausea and vomiting of patients in breathing exercise group best than they are in control group this is clear from the mean of (2.33) and (1.40), respectively. The mean difference between acupressure and diaphragmatic breathing exercise group was (0.367) at p value of (0.075), this means that there is no clear difference in the level of nausea and vomiting in patients in both group.

The present study result is consistent with the result of the study done by Mobarakabadi ,et al., (2020) conducted a randomized, single-blind, placebo-controlled trail in Iran to examines the effect of (P6) acupressure with Sea-Band on the severity and frequency of nausea and vomiting of pregnancy. In the intervention group a Sea-Band with a button was utilize to apply P6 acupressure for three days where as in the placebo group didn't apply any pressure from the Sea-Band on pc6 ; the control group didn't receive any intervention. The study finding highlight that there were no significant difference among three groups for frequency ,duration and severity of nausea and vomiting prior to intervention (p-value

=0.82, 0.12 ,and 0.72),whereas there were significance difference regarding these variable the three group following the intervention (p-value<0.05). Furthermore, the present study result come along with the finding randomized controlled trail conducted by (Bastamizad, 2023) to investigate the effects of an incentive spirometer versus deep breathing exercises on nausea and vomiting after laparoscopic cholecystectomy surgery. Which found a non-statistically significance difference between the two group prior implementing the intervention protocol ,while there were significance difference among both group during the 1st and 2nd assessment following the intervention protocol, total MS of nausea and vomiting for study group patient was lower than control group patient .

The result as shown in table (4-8) indicate that by using VAS, the mean difference between control and acupressure group was (1.300) at p value (0.000) that mean the level of nausea and vomiting of patients in acupressure group best than they are in control group this is clear from the mean (2.33) and (1.03), respectively. The mean difference between control and breathing exercise group was (0.667) at p value of (0.004) that mean the level of nausea and vomiting of patients in breathing exercise group best than they are in control group this is clear from the mean (2.33),(1.67), respectively. The mean difference between acupressure and breathing exercise group was (0.633) at p value of (0.006) that mean the level of nausea and vomiting of patients in acupressure group best than they are in breathing exercise group this is clear from the mean of (1.03) and (1.67), respectively.

These result agrees with the result of study done by Hofmann ,et al., (2017) to identify the impact of acupressure on point P6 to reduce postoperative nausea and vomiting in patients who they undergo high-risk ambulatory surgery was employed VAS to collect data. Which found were significance difference among both group during the pre -test and post-test assessment following implication acupressure technique, total MS of

nausea and vomiting for study group patient was lower than control group patient. Furthermore, the present study result come along with the finding randomized controlled trail conducted by Gluten & Bane (2020) to examine the effect of acupuncture in postoperative pain and nausea and vomiting in patients following laparoscopic cholecystectomy. The tool used to collect data VAS, which was identified that patient in experimental group complain of fewer episode of pain and nausea and vomiting after performing acupressure technique, were significantly lower ($p < 0.001$). Additionally, the incidence of nausea and vomiting was decreased between the 2nd and 6th hours ($p = 0.003$ and $p= 0.01$), respectively. Also the present study consist with finding a randomized placebo-controlled design done by Kilinç& Özlü (2022). A study conducted in Turkey by implementation acupressure technique was significantly improved sleep quality, decreased level of vomiting and nausea following laparoscopic cholecystectomy after implementation this intervention protocol. Although, the present study results are in line with the finding of a quasi-experimental study conducted by Seed (2017) conducted a randomized , double-blind in United States, to investigate the impact of PC6 acupressure technique on nausea and vomiting in patients who were undergoing abdominal surgery. VAS were measured, the study finding highlight that there were significant difference differences regarding these variable across the control and following intervention group p-value < 0.05.

Hussain & Taha (2018) to investigate the effect of breathing exercises on quality of recovery and nausea post-operative method was used to select the participants of the study included visual analog scales and quality assessments . Which was identified the patient in the experimental group complain of fewer episodes of nausea and enhances the quality of recovery after surgery after performing breathing exercise ($p<0.05$)in comparison to patient in the control group received regular postoperative care.

5.7:Discusion the association between the effect of acupressure technique on nausea and vomiting with patient socio-demographic characteristics and clinical data:

The result of table (4-9) indicates a non- statistically significant association was found between the effect of acupressure technique with patients socio- demographic characteristics and clinical data at p-value >0.05 .while a significant difference was founded between the effect of acupressure technique on the severity of nausea and vomiting and past at p- value 0.044. This result come along a randomized controlled trial conducted by Küçük & Bülbül, (2021) performed in the United States to investigate the effects of acupressure on nausea, vomiting, and vital signs in patients undergoing gynecologic surgery .The finding reveal that none of parameter that were selected (age, BMI, educational background, income status, gender, smoking, having a history of vomiting and nausea , previous surgery) had non-significance correlation with experiences nausea and vomiting.

Hamid, et al., (2022) randomized control trail study to investigate the effectiveness of acupressure on nausea and vomiting post-operative. The study showed no significant difference between the socio-demographic factors and clinical data on the severity of nausea and vomiting

5.8.Discussion the association between the effect of diaphragmatic breathing exercise on nausea and vomiting with demographic characteristics and clinical data of patients:

The result in table (4-10) reveal a non- statistically significant association was found between the effect of breathing exercise on nausea and vomiting with patients socio demographic characteristics and clinical data (age, educational level, occupational status, BMI, sex, patient's prior exposure to surgery, and smoking status), at p-value >0.05. This indicates the diaphragmatic breathing exercise helped all patients, without any

variation in improvement; reduce their degree of nausea and vomiting, regardless of the categories of demographic features and clinical data. This result go beyond previous study conducted by Yokogawa, et al., (2018) randomized control trials conducted in Japan to identify the influence of two guideline for deep breathing exercise(non-specific) and diaphragmatic breathing exercise observed that some variable showed variation among gender and the elderly female have specific challenge with diaphragmatic breathing.

Hussein & Taha (2018) in Egypt randomized control trail to determine the impact of breathing exercises on the quality of recovery among postoperative nausea and vomiting patients. The study found that there was no statistically significant difference between the intervention and control groups in terms of age, educational qualification, residence, and occupational status.

5.9.Conclusion:

The present Study concludes that:

1. There is a moderate severity of nausea and vomiting among patient with cholecystectomy.
2. The application of acupressure technique by using an elastic wrist band for 6 hours continuously and pressing the stud for 3-5 minutes every hour was effective in reducing the severity of nausea and vomiting level in patients with cholecystectomy.
3. Diaphragmatic breathing exercise for 3-5 minutes every hour for 6 hours continuously is an effective , non-invasive intervention to reduce the severity of nausea and vomiting in patient with cholecystectomy .
4. There are no significant differences between the effect of acupressure technique on the severity of nausea and vomiting and patient's socio-demographic and clinical data, only a significant difference was found in the effect of acupressure technique on the severity of nausea and vomiting was related to past surgery.
5. There are no significant differences between the effect of diaphragmatic breathing exercises on the severity of nausea and vomiting and patient's socio-demographic and clinical data.
6. There are the study rejected null hypothesis and accepted alternative hypothesis ,They are found significant effect on the acupressure technique and diaphragmatic breathing exercises on the severity of nausea and vomiting in patient with cholecystectomy.

5.10. Recommendations:

Based on the study result and conclusion ,the researcher recommended :

1. The researcher recommended to use the acupressure technique and breathing exercises in addition to the routine care in the management of nausea and vomiting in patient with cholecystectomy to enhance patients' health status.
2. Further studies should be conducted to investigate the effects of different acupressure point to manage pain ,nausea and vomiting in patient with cholecystectomy .
3. Additional study is recommended to assess the long-term effects of diaphragmatic breathing exercise on pain after abdominal surgery.
4. All patients postoperative should be provide a teaching session on how to perform acupressure and diaphragmatic breathing exercise to decrease nausea and vomiting level.
5. All nursing staff in the surgery wards should be enrolled in training course about the using acupressure and diaphragmatic breathing exercise.

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Appendices

Appendix A1

Arrangement of University of Kerbala \ Collage of Nursing

العدد : د.ع/ 329

التاريخ: ٥ / ١١ / 2023

الى / دائرة صحة كربلاء المقدسة – مركز التدريب و التنمية البشرية

م/ تسهيل مهمة

تحية طيبة...

يرجى التفضل بالموافقة على تسهيل مهمة طالبة الدراسات العليا / الماجستير (بشرى عبد علي جاسم) في كليتنا للعام الدراسي (2023-2024) لغرض جمع العينات الخاصة برسالتها الموسومـــة :

"اثر تقنيه الضغط وتمارين تنفس الحجاب الحاجز في الغثيان و التقيء لدى مرضى استئصال المرارة : دراسة مقارنة"

"Effect of Acupressure Technique and Diaphragmatic Breathing Exercise on Nausea and Vomiting in Cholecystectomy Patient A comparative Study "

** مـــع التقديـــر **

أ.م.د. سلمان حسين فارس الكريطي
معاون العميد للشؤون العلمية و الدراسات العليا
2023 / 11 / 5

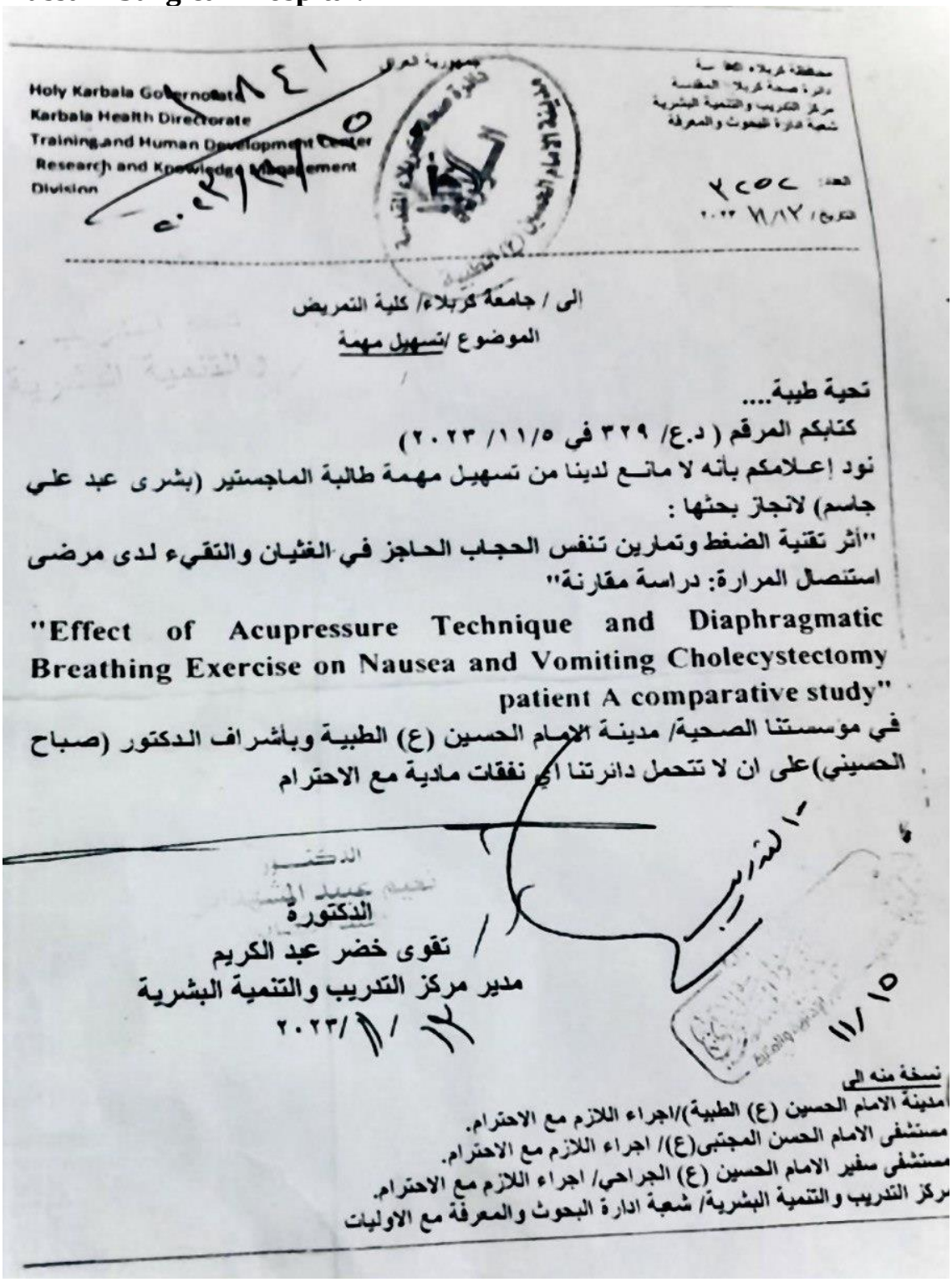
جامعة كربلاء - كلية التمريض - شعبة الدراسات العليا

نسخة منه الى :
- مكتب السيد المعاون العلمي المحترم .
- شعبة الدراسات العليا .

العنوان : العراق - محافظة كربلاء المقدسة – حي الموظفين - جامعة كربلاء
Mail: nursing@uokerbala.edu.iq website:

Appendix A2

Administrative arrangement of Ministry of Health / Kerbala Health Department / Imam Hussain Medical City/ Safer Al- Imam Hussain Surgical Hospital.



Holy Karbala Governorate
Karbala Health Directorate
Training and Human Development Center
Research and Knowledge Management Division

الى / جامعة كربلاء/ كلية التمريض
الموضوع /تسهيل مهمة

تحية طيبة....
كتابكم المرقم (د.ع/ ٣٢٩ في ١١/٥/ ٢٠٢٣)
نود إعلامكم بأنه لا مانع لدينا من تسهيل مهمة طالبة الماجستير (بشرى عبد علي جاسم) لانجاز بحثها :
"أثر تقنية الضغط وتمارين تنفس الحجاب الحاجز في الغثيان والتقيء لدى مرضى استئصال المرارة: دراسة مقارنة"

"Effect of Acupressure Technique and Diaphragmatic Breathing Exercise on Nausea and Vomiting Cholecystectomy patient A comparative study"

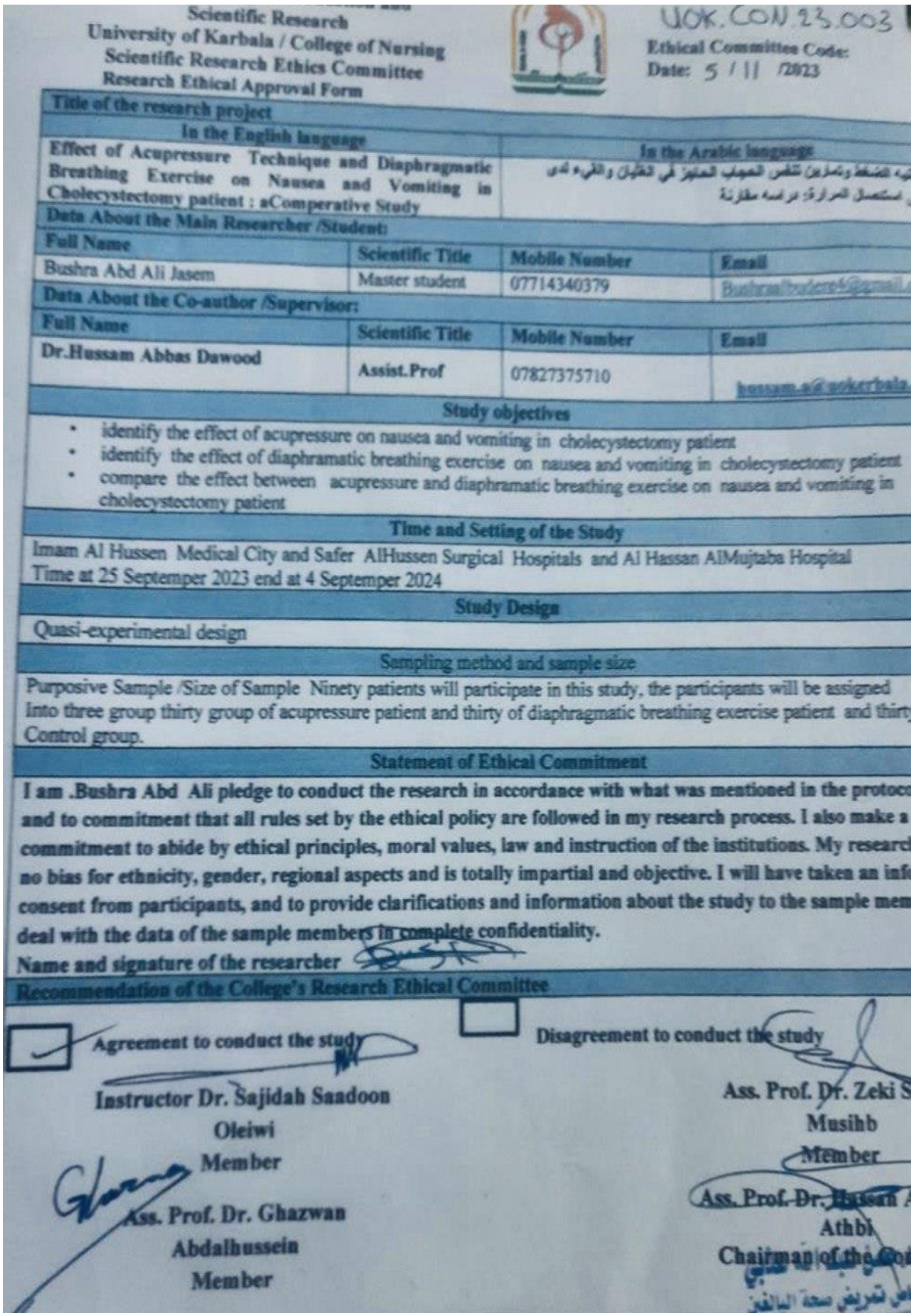
في موسستنا الصحية/ مدينة الامام الحسين (ع) الطبية وباشراف الدكتور (صباح الحسيني)على ان لا تتحمل دائرتنا اي نفقات مادية مع الاحترام

الدكتورة
تقوى خضر عبد الكريم
مدير مركز التدريب والتنمية البشرية
٢٠٢٣/ ١١/ ١٢

نسخة منه الى
مدينة الامام الحسين (ع) الطبية)/اجراء اللازم مع الاحترام.
مستشفى الامام الحسن المجتبى(ع)/ اجراء اللازم مع الاحترام.
مستشفى سفير الامام الحسين (ع) الجراحي/ اجراء اللازم مع الاحترام.
مركز التدريب والتنمية البشرية/ شعبة ادارة البحوث والمعرفة مع الاوليات

Appendix B

Ethical consideration



Scientific Research
University of Karbala / College of Nursing
Scientific Research Ethics Committee
Research Ethical Approval Form

UOK.CON.23.003
Ethical Committee Code:
Date: 5 / 11 /2023

Title of the research project	
In the English language	In the Arabic language
Effect of Acupressure Technique and Diaphragmatic Breathing Exercise on Nausea and Vomiting in Cholecystectomy patient : aComperative Study	تاثير الضغط وتمارين تنفس الحجاب الحاجز في الغثيان والقيء لدى مستئصل المرارة: دراسة مقارنة

Data About the Main Researcher /Student:			
Full Name	Scientific Title	Mobile Number	Email
Bushra Abd Ali Jasem	Master student	07714340379	Bushraalbadery6@gmail.c

Data About the Co-author /Supervisor:			
Full Name	Scientific Title	Mobile Number	Email
Dr.Hussam Abbas Dawood	Assist.Prof	07827375710	hussam.a@uokerbala.

Study objectives

- identify the effect of acupressure on nausea and vomiting in cholecystectomy patient
- identify the effect of diaphramatic breathing exercise on nausea and vomiting in cholecystectomy patient
- compare the effect between acupressure and diaphramatic breathing exercise on nausea and vomiting in cholecystectomy patient

Time and Setting of the Study

Imam Al Hussen Medical City and Safer AlHussen Surgical Hospitals and Al Hassan AlMujtaba Hospital Time at 25 Septemper 2023 end at 4 Septemper 2024

Study Design

Quasi-experimental design

Sampling method and sample size

Purposive Sample /Size of Sample Ninety patients will participate in this study, the participants will be assigned Into three group thirty group of acupressure patient and thirty of diaphragmatic breathing exercise patient and thirty Control group.

Statement of Ethical Commitment

I am .Bushra Abd Ali pledge to conduct the research in accordance with what was mentioned in the protoco and to commitment that all rules set by the ethical policy are followed in my research process. I also make a commitment to abide by ethical principles, moral values, law and instruction of the institutions. My researc no bias for ethnicity, gender, regional aspects and is totally impartial and objective. I will have taken an inf consent from participants, and to provide clarifications and information about the study to the sample mem deal with the data of the sample members in complete confidentiality.

Name and signature of the researcher

Recommendation of the College's Research Ethical Committee

☑ **Agreement to conduct the study** ☐ **Disagreement to conduct the study**

Instructor Dr. Sajidah Saadoon Oleiwi
Member

Ass. Prof. Dr. Ghazwan Abdalhussein
Member

Ass. Prof. Dr. Zeki S Musihb
Member

Ass. Prof. Dr. Hassan A Athbi
Chairman of the Co

Appendix C1

Applying Acupressure wrist band

Appendix C2

Applying Acupressure wrist band

Appendix C3

Applying diaphragmatic breathing exercises

Appendix D1

The study instrument

بسمه تعالى

الاستبانة في ادناه هي جزء من دراسة بعنوان **"اثر تقنيه الضغط وتمارين تنفس الحجاب الحاجز في الغثيان والقيء لدى مرضى استئصال المرارة:دراسة مقارنة"**

ان كافة الاجابات ستعامل بسرية تامة ضمن اطار البحث العلمي فقط .

المحور الأول: البيانات الديموغرافية –الاجتماعية والصحية

1.العمر: ☐ **سنة**

2.الجنس: ☐ **ذكر** ☐

3.المستوى التعليمي:

☐ **لا يقرأ ولا يكتب**

☐ **يقرأ ويكتب**

☐ **خريج مدرسة ابتدائية**

☐ **خريج مدرسة ثانوية**

☐ **خريج معهد**

☐ **خريج كلية فما فوق**

4. الحالة المهنية:

☐ **متقاعد**

☐ **ربة بيت**

☐ **موظف حكومي**

☐ **عاطل**

☐ **اعمال حرة**

5. عمليات جراحية سابقة: ☐ **نعم** ☐ **لا**

6. التدخين: ☐ **نعم** ☐ **لا**

7. الوزن: ☐ **الطول** ☐

Appendix D2

The study instrument

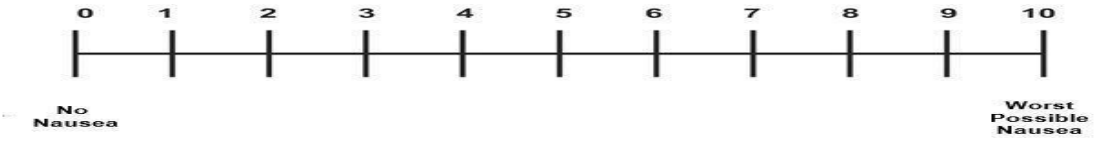
المحور الثالث :مقياس رود س للغثيان والقيء والهواع بعد٦ ساعات من الجراحة

الإسئلة	0	1	2	3	4
١-هل تقيأت خلال اخر٦ ساعات	لم اتقي ابدا	١- ٢ مرة	٣-٤مرة	٥-٦مرة	٧او اكثر
٢-هل شعرت بالضيق بسبب التهوع وكدت ان تتقيأ خلال اخر٦ساعات	كلا	قليل	متوسط	كثيرا	كثيرا جدا
٣-هل شعرت بالضيق بسبب القيء او التقيؤ خلال اخر ٦ ساعات	كلا	قليل	متوسط	كثيرا	كثيرا جدا
٤-- هل شعرت بالغثيان والم في المعدة في اخر ٦ ساعات	ليس كل الاحيان	١ساعة او اقل	٢-٣ ساعة	٤-٦ ساعة	اكثر من ٦ ساعات
٥-هل شعرت بالضيق من الغثيان والم المعدة في اخر ٦ ساعات	كلا	قليل	متوسط	كثيرا	كثيرا جدا
٦-ماهي كميه التقيؤ الناتجة في اخر٦ ساعات	لم اتقي ابدا	كمية قليلة جدا ١/٢كوب تقريبا	كمية متوسطة ٢كوب تقريبا	كمية كثيره تقريبا٢-٣كوبا	كميه كثيرة جدا تقريبا ٣كوب او اكثر
٧-كم عدد المرات التي شعرت بالغثيان والم المعدة في اخر ٦ ساعات	كلا	١-٢مرة	٣-٤مرة	٥-٦ مرة	٧او اكثر
٨ –هل عانيت من الهواع وكدت ان تتقي بدون اخراج اي شيء في اخر٦ ساعات	كلا	١-٢مرة	٣-٤مزة	٥-٦ مرة	٧او اكثر

Appendix D3

The study instrument

المحور الرابع :مقياس الغثيان التناظري VAS



Appendix E

قائمة أسماء الخبراء

ت	اسم الخبير	اللقب العلمي	مكان العمل	الاختصاص الدقيق	سنوات الخبرة
1	د.راجحة عبد الحسن حمزة	أستاذ	جامعة الكوفة/ كلية التمريض	تمريض بالغين	٣٩سنة
2	د. فاطمة مكي محمود	أستاذ	جامعة كربلاء / كلية التمريض	تمريض بالغين	٢٨سنة
3	د. سلمان حسين فارس	أستاذ مساعد	جامعة كربلاء / كلية التمريض	تمريض صحة المجتمع	٣٢سنة
4	حسن عبد الله عذبي	أستاذ مساعد	جامعة كربلاء / كلية التمريض	تمريض بالغين	٢١سنة
5	د. وفاء عبد علي حطاب حسن	أستاذ مساعد	جامعة بغداد/ كلية التمريض	تمريض بالغين	١٧ سنة
6	د. ضياء كريم عبد علي	أستاذ مساعد	جامعة العميد /كلية التمريض	تمريض بالغين	١٧ سنة
7	د. سيروان جعفر باقي	أستاذ مساعد	جامعة بغداد/ كلية التمريض	تمريض بالغين	١٦سنة
8	د. محمد عبد الكريم مصطفى	أستاذ مساعد	جامعة الكوفة/ كلية التمريض	تمريض بالغين	١٦سنة
9	د. جهاد جواد كاظم	أستاذ مساعد	جامعة الكوفة/ كلية التمريض	تمريض بالغين	١٥سنة
10	د. صادق عبدالحسين حسن	أستاذ مساعد	جامعة بغداد / عميد كلية التمريض	تمريض بالغين	١٢سنة
11	د.حيدر محمد حالوب	أستاذ مساعد	جامعة الكوفة/ كلية التمريض	تمريض بالغين	١٤ سنة
12	د. عامر محمد غبيش	مدرس	كلية الصفوة الجامعة / كلية التمريض	تمريض بالغين	٢٦سنة
13	د. صباح كريم الحسيني	طبيب اختصاص	مستشفى الامام الحسين الطبية	اختصاص جراحة عامة	٢٨ سنة
14	د. عامر محمد المسعودي	طبيب اختصاص	مستشفى الامام الحسين الطبية	اختصاص جراحة عامة	١٣ سنة
15	د. سمير غافل الزويني	طبيب اختصاص	مستشفى الامام الحسين الطبية	اختصاص جراحة عامة	٢٨ سنة

Appendix F

موافقة خطية للمشاركة في بحث

الرجاء التوقيع أسفل الصفحة كي تشهد بان:

بعد ان قامت طالبة الماجستير **(بشرى عبد علي جاسم)** بشرح وتوضيح جميع التساؤلات بخصوص بحثها الموسوم (**أثر تقنية الضغط و تمارين التنفس في شدة الغثيان والقيء لدى مرضى استئصال المرارة : دراسة مقارنة**), حيث اطلعني صاحب البحث عن فائدة بحثه واهميته العلمية .كما واطلعني ان مشاركتي هذه هي تطوع مني وبمحض ارادتي وان بإمكاني رفض المشاركة او سحبها متى شئت ولأي سبب كان, او ان ارفض الاجابة على اي سؤال , كما ان مشاركتي بالبحث لن تحملني اي نفقات او مسائلة من شئنها الضرر بمهنتي او شخصيتي, كما ان المعلومات الناتجة عن مشاركتي سوف تعامل بسرية تامة ولن يطلع عليها اي شخص وان هذه المعلومات ونتائجها هي للأغراض العلمية فقط ولن تكون هناك اي اشارة الى شخصي او عائلتي في اي منشور عن هذه الدراسة

.

ولأجل هذا فاني اوقع على مشاركتي في هذا البحث

يرجى كتابة التاريخ بجانب التوقيع

توقيع المشارك ..... التاريخ \ \

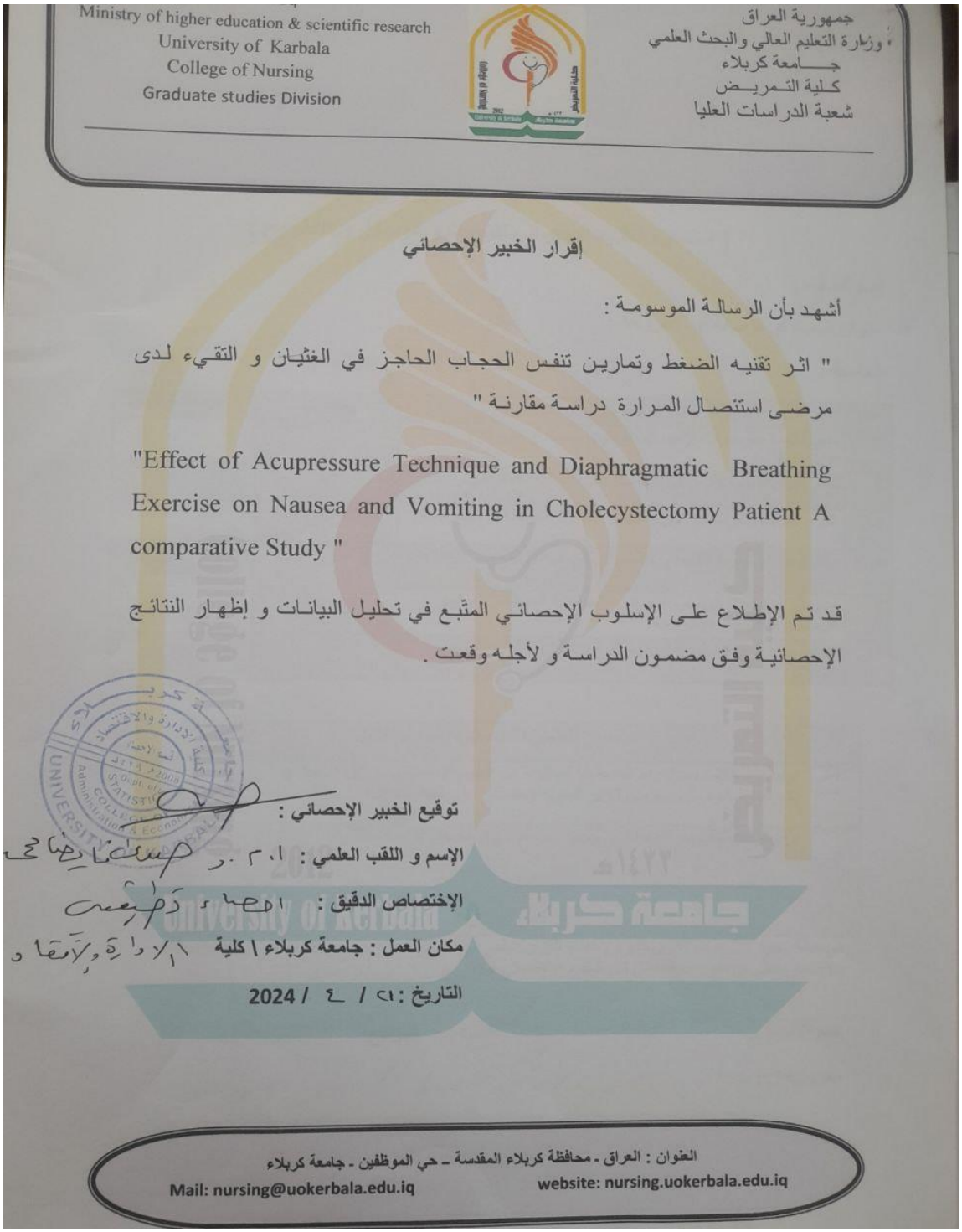
توقيع الباحث ..... التاريخ \ \

Appendix G

Theacupressure wrist band that used in present study

Appendix H

The statistician opinion



Ministry of higher education & scientific research
University of Karbala
College of Nursing
Graduate studies Division

جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جـــامعة كربلاء
كـلية التـمريـض
شعبة الدراسات العليا

إقرار الخبير الإحصائي

أشهد بأن الرسالة الموسومة :

" اثر تقنيه الضغط وتمارين تنفس الحجاب الحاجز في الغثيان و التقيء لدى مرضى استئصال المرارة دراسة مقارنة "

"Effect of Acupressure Technique and Diaphragmatic Breathing Exercise on Nausea and Vomiting in Cholecystectomy Patient A comparative Study "

قد تم الإطلاع على الإسلوب الإحصائي المتّبع في تحليل البيانات و إظهار النتائج الإحصائية وفق مضمون الدراسة و لأجله وقعت .

توقيع الخبير الإحصائي :

الإسم و اللقب العلمي : ا.م.د مستضاء ظاهر محمد

الإختصاص الدقيق : احصاء رياضي

مكان العمل : جامعة كربلاء / كلية الإدارة والاقتصاد

التاريخ : ١٥ / ٤ / 2024

العنوان : العراق - محافظة كربلاء المقدسة ـ حي الموظفين - جامعة كربلاء
Mail: nursing@uokerbala.edu.iq website: nursing.uokerbala.edu.iq

Appendix I

Opinion Language expert

Republic of Iraq
Ministry of higher education & scientific research
University of Karbala
College of Nursing
Graduate studies Division

جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جـــامعة كربلاء
كـلية التـمريـض
شعبة الدراسات العليا

إقرار الخبير اللغوي

أشهد بـأن الرسالـة الموسومـة :

" تأثير تقنيه الضغط وتمارين التنفس باستخدام الحجاب الحاجز في الغثيان والتقيء لدى مرضى استئصال المرارة دراسه مقارنه "

" Effect of Accupressure Technique and Diphragmatic Breathing Exercise on Nausea and Vomiting in Cholecystectomy Patient Acomperative Study "

قد جرى مراجعتـها مـن الناحيـة اللغويـة بحيث أصبحت بإسلـوب علمـي سليم خـالٍ مـن الأخطـاء اللغويـة و لأجلـه وقعت .

توقيع الخبير اللغوي :

الإسم و اللقب العلمي : م.د. حاسم كفاية مجول

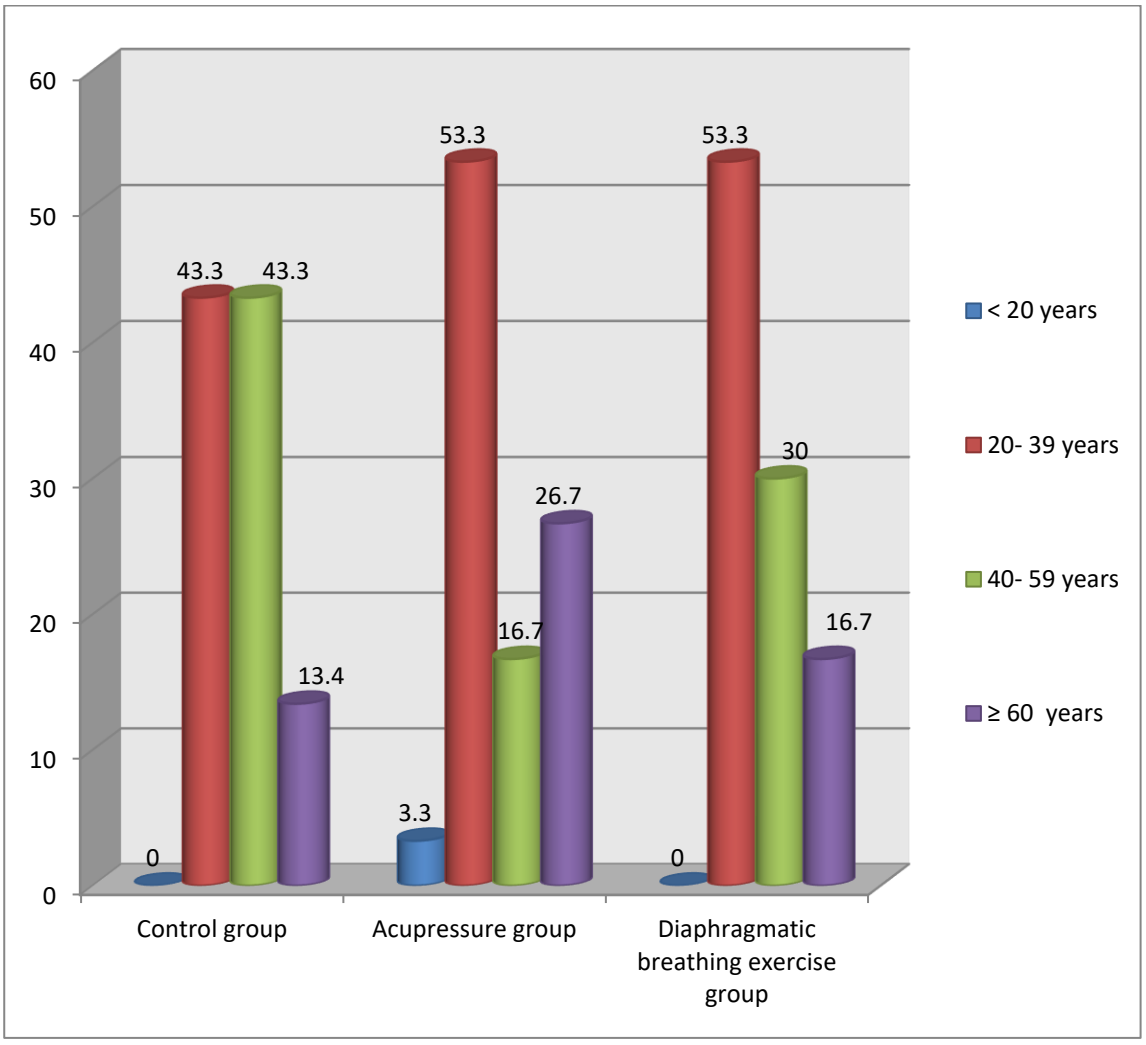
الإختصاص الدقيق : علم اللغة

مكان العمل : جامعة كربلاء / كلية التربية للعلوم الإنسانية

التاريخ : 12 / 5 / 2024

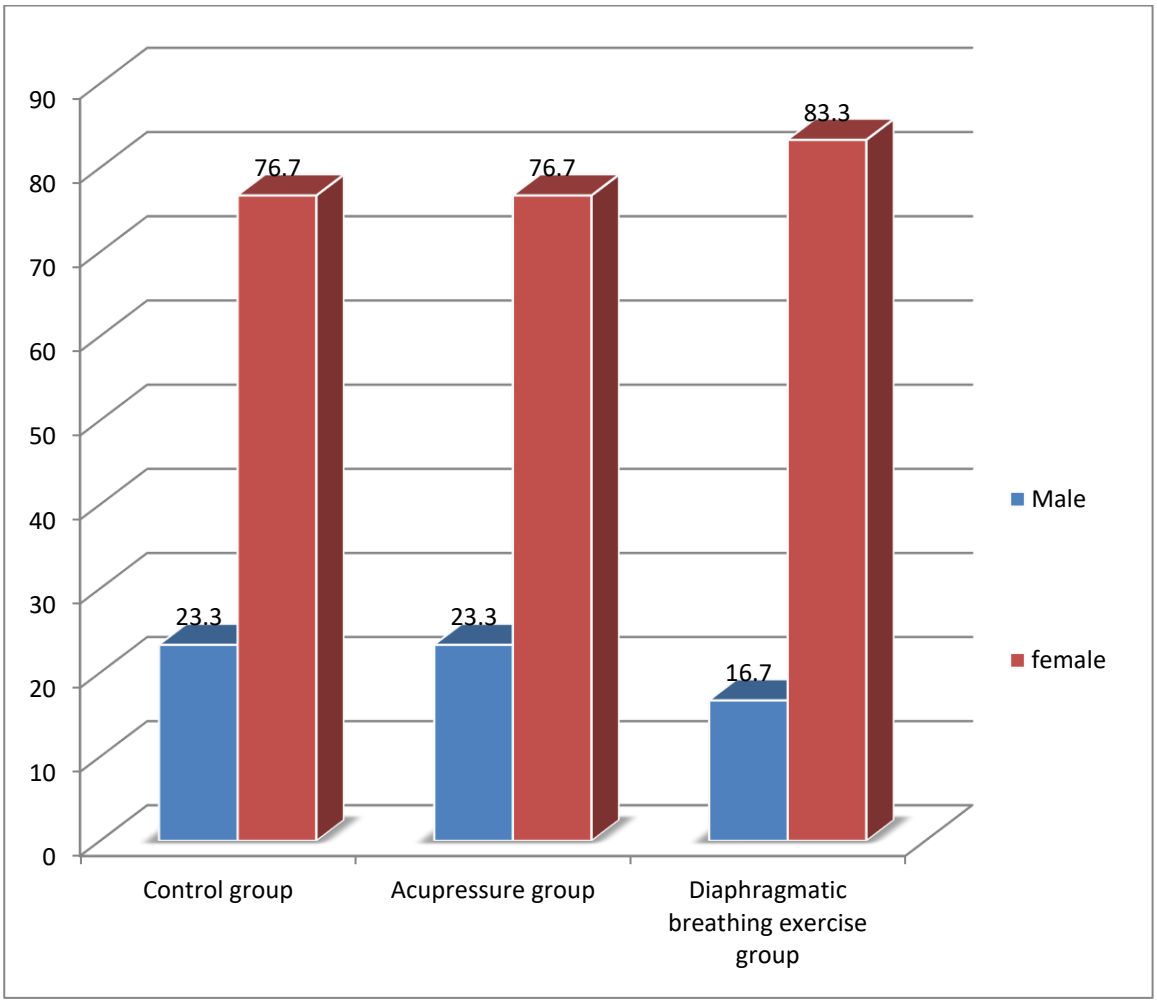
Appendix J

Distribution of patients according to age group



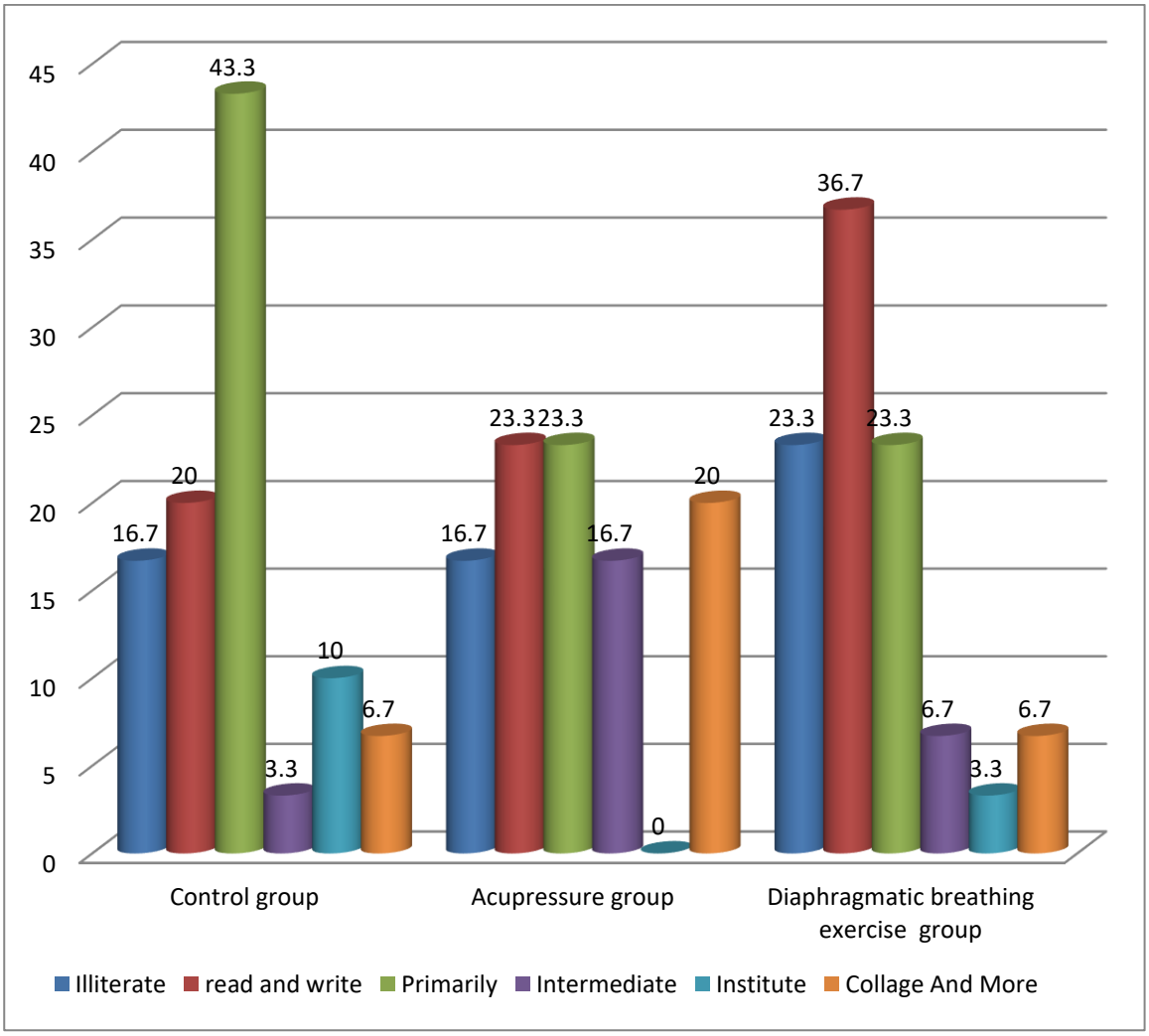
Appendix K

Distribution of patients according to sex group



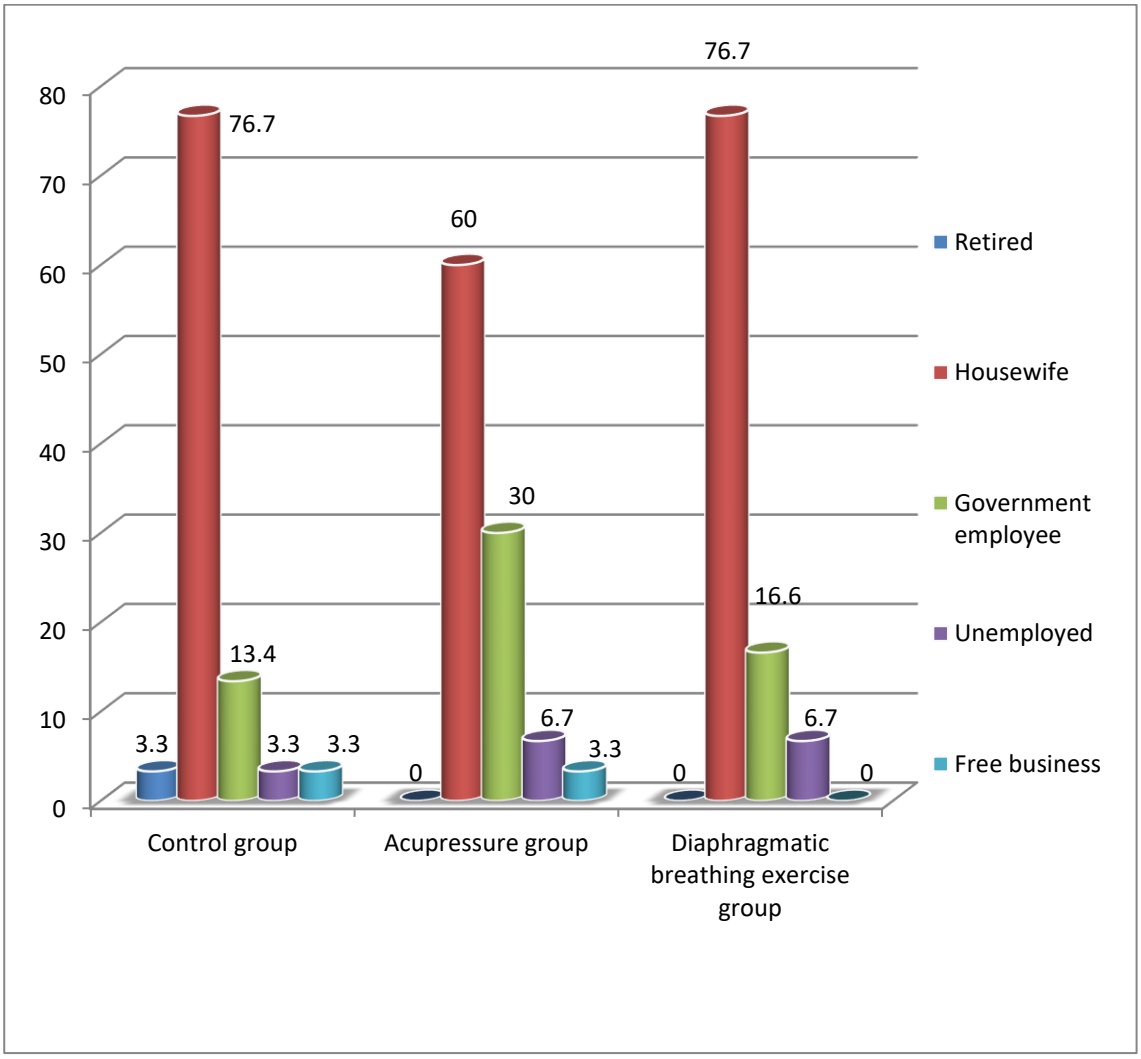
Appendix L

Distribution of patient according to educational status



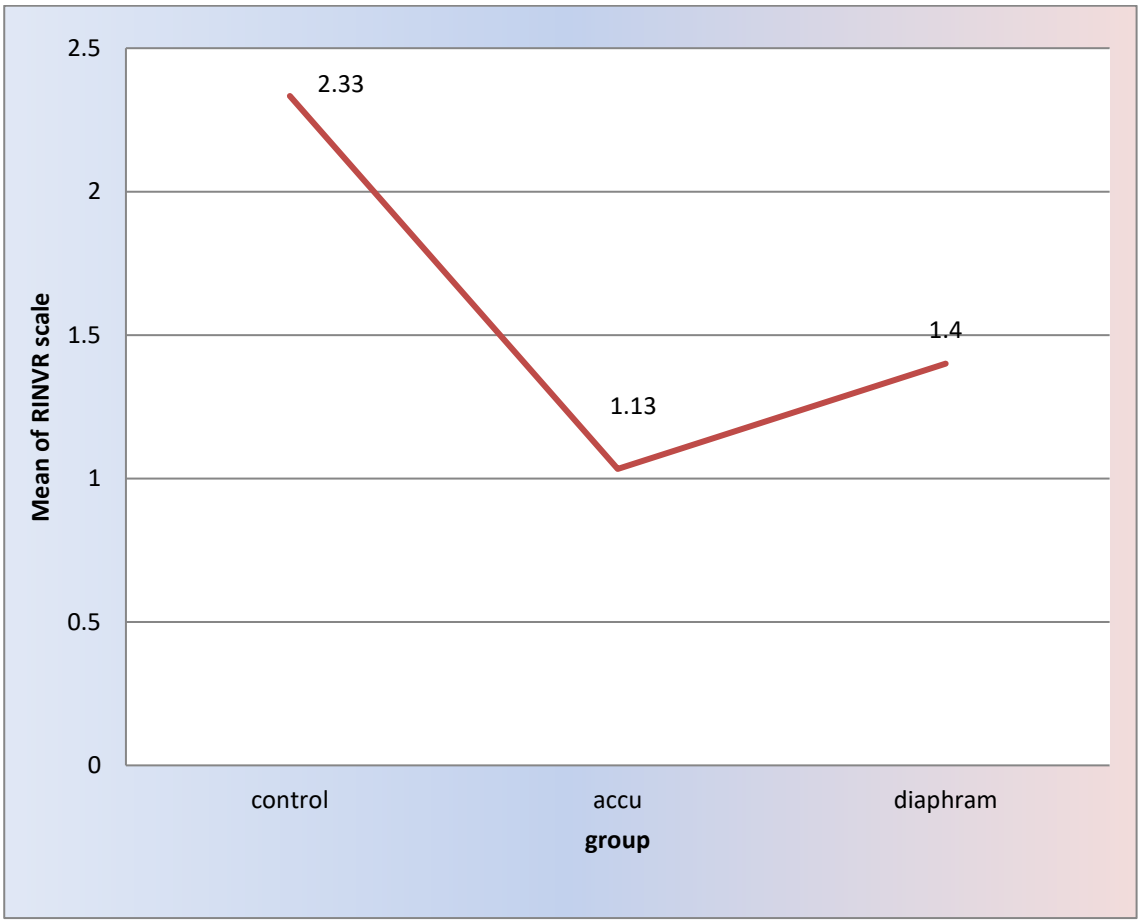
Appendix M

Distribution of patient according to occupational status



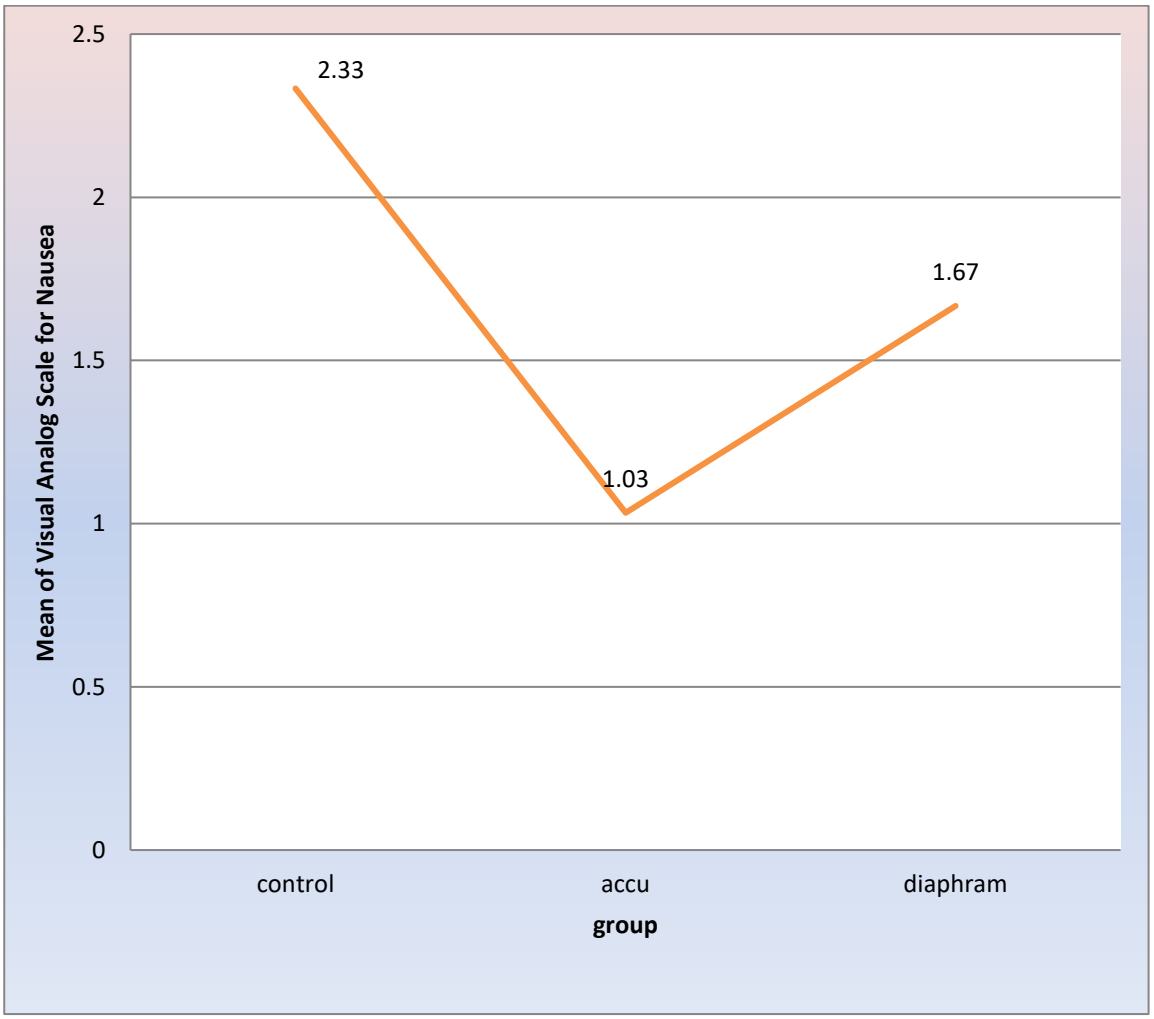
Appendix N

Comparisons the differences of nausea and vomiting levels among patients in three groups using RINVR



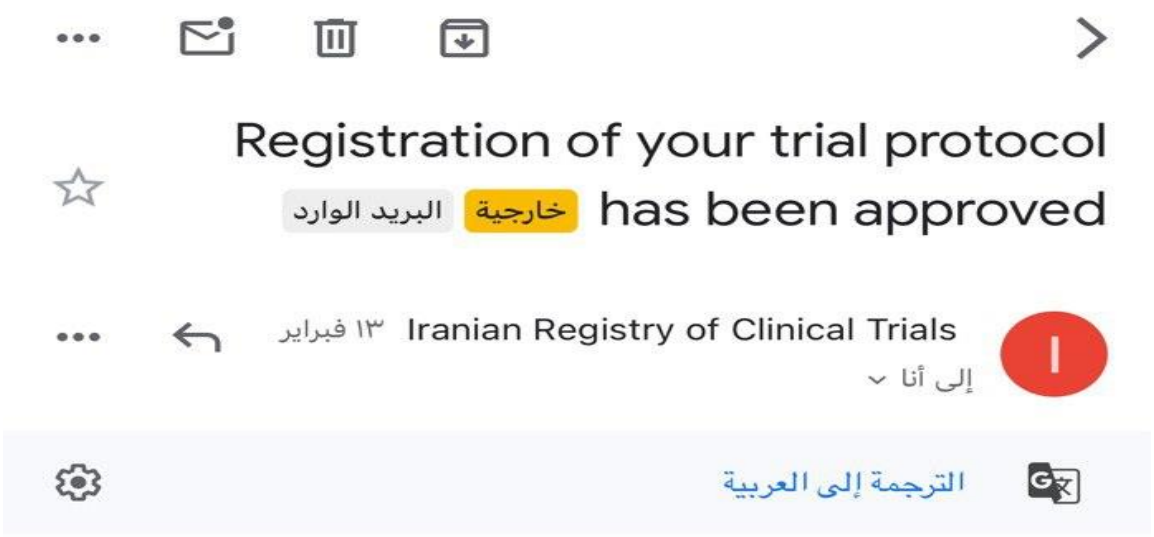
Appendix O

Comparisons the differences of nausea and vomiting levels among patients in three groups using Visual Analog Scale



Appendix P

Clinical trail regestration



Registration of your trial protocol has been approved

البريد الوارد خارجية

Iranian Registry of Clinical Trials ١٣ فبراير

إلى أنا

الترجمة إلى العربية

IRCT
Iranian Registry of Clinical Trials

Dear Bushra.A. jasem Jasem,

Registration of your trial protocol under the scientific name of

Effect of Acupressure Technique and Diaphragmatic Breathing Exercise on Nausea and Vomiting in Cholecystectomy Patient: A comparative study

has been approved in Iranian Registry of Clinical Trials at 2024-02-13.

Your registration reference is IRCT20240111060680N1.

Best Regards

Iranian Registry of Clinical Trials (IRCT)

Bushra عزیز،

با سلام

ثبت پروتکل مطالعه کارآزمایی بالینی شما تحت عنوان

Effect of Acupressure Technique and Diaphragmatic Breathing Exercise on Nausea and Vomiting in Cholecystectomy Patient: A comparative study

در تاریخ ۱۴۰۲/۱۱/۲۴ در مرکز ثبت کارآزمایی بالینی ایران تایید شد.

شماره کد ثبت شما IRCT20240111060680N1 است.

الخلاصة

الخلفية: استئصال المرارة هو ثاني أكثر عمليات البطن شيوعًا بعد استئصال الزائدة الدودية، ولكنه مرتبط بعدد من الآثار الجانبية. الغثيان والقيء هما أكثر الآثار الجانبية شيوعًا لاستئصال المرارة. لذلك، تهدف هذه الدراسة إلى فحص تأثير تقنية الضغط وتمارين تنفس الحجاب الحاجز على الغثيان والقيء لدى مرضى استئصال المرارة.

منهجية البحث: أجريت دراسة شبه تجريبية بين 26 ايلول 2023 ولغاية 12 أيار2024، في مدينة الإمام الحسين الطبية ومستشفى سفير الإمام الحسين الجراحي. تضمنت الدراسة عينة غير احتمالية (هادفة) تتكون من تسعين مريضًا يخضعون لاستئصال المرارة وتم تقسيمهم إلى مجموعة تقنية العلاج بالضغط ومجموعة تمارين التنفس والمجموعة الضابطة. تم جمع البيانات باستخدام مقياس تقييم الغثيان والقيء RINVR ومقياس الغثيان التناظري . تم التحقق من مصداقية المقاييس من خلال عرضها على لجنة مكونة خمسة عشر خبيرًا, وتم تحديد الثبات من خلال الدراسة التجريبية. يتضمن التحليل الإحصائي الوصفي التردد والنسبة المئوية٪, متوسط الدرجات والانحراف المعياري. ويتضمن التحليل الاستنتاجي استخدام تحليل التباين (ANOVA) واختبار t للعينات المقترنة واختبار t للعينات المستقلة لفحص نتائج الدراسة، وتم تحديد قيمة الدلالة الاحصائية بمستوى معنوية اقل من0.05

النتائج: أظهرت نتائج الدراسة ان جميع المرضى في المجموعات الثلاث يعانون مستوى متوسط من الغثيان والقيء؛ أثناء التقييم خلال الاختبار القبلي53.3٪ و46.7٪ و 33.3٪ لمجموعة الضابطة ومجموعة العلاج بالضغط ومجموعة تمارين التنفس على التوالي. وعلاوة على ذلك، وجد فرق كبير في مستوى الغثيان والقيء بمستوى دلالة احصائية(0.00) ومتوسط الفرق 1.300 في الاختبار البعدي بين مجموعة الضابطة ومجموعة الضغط. بينما كان متوسط الفرق بين مجموعة الضابطة ومجموعة تمارين التنفس 0.933 بمستوى دلالة احصائية (0.00)

الاستنتاجات: ان استخدام تقنية الضغط وتمارين التنفس هي طريقة فعالة في تقليل شدة الغثيان والقيء بين المرضى بعد عملية استئصال المرارة.

التوصيات: أوصت الدراسة بأهمية إجراء تمارين الضغط والتنفس لمرضى استئصال المرارة الذين يعانون من الغثيان والقيء.

جامعة كربلاء

كلية التمريض

أثر تقنية الضغط وتمارين تنفس الحجاب الحاجز على الغثيان والقيء لدى مرضى استئصال المرارة: دراسة مقارنة

رسالة مقدمة الى مجلس كلية التمريض/ جامعة كربلاء وهي جزء من متطلبات نيل درجة الماجستير في علوم التمريض

كُتب بواسطة :

بشرى عبد علي جاسم

بإشراف :

أ .م .د. حسام عباس داود

محرم- ١٤٤٦هـ تموز – ٢٠٢٤ م