

Effect of Acupressure Therapy on Postoperative Reported Patient's Outcomes after Abdominal Surgery

Amel Saied Mahmoud ^{1*}, Shaimaa Mohamed Elhadary²

¹ Lecturer of Medical surgical Nursing, Faculty of Nursing, Cairo University, Egypt

² Assistant Professor of Medical Surgical Nursing, Faculty of Nursing, Cairo University, Egypt

*Corresponding Author's Email: amalsaied19@yahoo.com

Abstract: Background: Pain, nausea and vomiting are the most distressing problems after abdominal surgery. Side effects and high costs of antiemetics and analgesics have led many practitioners to investigate alternative methods as acupressure for minimizing postoperative pain, nausea and vomiting.

Aim: To evaluate the effect of acupressure therapy upon postoperative nausea, vomiting and the overall surgery pain experience among patients underwent abdominal surgery.

Methodology: Aquazi experimental pretest-posttest nonequivalent control group design was utilized. A Convenient sample of 60 adult patients underwent abdominal surgery were randomly divided into study and control groups (30 patients each). The current study was conducted in general surgery wards, at one of the teaching hospitals affiliated to Cairo University, Egypt. Data collected through, Demographic and medical data sheet, Rhodes Index of Nausea and Vomiting scale and A Visual Analogue Scale.

Results: There was a statistically significant difference between the intervention and control groups regarding the occurrence of nausea and vomiting (t-test= 3.28, p-value= 0.05 & t-test= 7.91, p-value= 0.01 respectively). Meanwhile, there was no significant difference between the intervention group and the control group in relation to retching (t-test= 0.77, p-value= 1.02). There was a decreasing pattern in pain intensity mean scores with statistically significant difference between the intervention and control group throughout the three first days postoperative (F-ratio = 50.28, p-value= 0.000). **Conclusion:** we must be mindful of the role of acupressure therapy in reducing postoperative pain nausea and vomiting.

Keywords: acupressure, postoperative pain, nausea and vomiting, reported patient outcomes.

I. INTRODUCTION

Abdominal surgery accounts for the highest volume of in-hospital operations and imposes substantial economic burden on healthcare systems. For patients, abdominal surgery represents a major stressor resulting in a postoperative decline in health, requiring weeks or months for full recovery. This health decline is mostly caused by a cascade of metabolic and hormonal events triggered by tissue trauma and may be further affected by postoperative complications as pain, nausea, vomiting and retching, in addition to specific perioperative interventions as administration of opioids and analgesia[1].

Abdominal surgery is a surgical operation that is performed in the abdominal region to diagnose or treat a medical condition. Most of these operations are considered as major operations that are followed by extended recovery and down time period. Abdominal surgery patients typically need at least five to six days of recovery time before heading home from the hospital[2].

As understanding patients' perspective is critical for providing high-value patient-centered care, recent literature advocates that measurement of recovery includes the patients' voice through patient-reported outcomes in another word, reports of health coming directly from the patient without interpretation by others to engage patients as the key stakeholders in the recovery process[1].

A growing awareness of quality in health care has called for a focus on postoperative morbidities, which still remain challenging in our daily practice of surgery, such as nausea, vomiting, and pain [3]. Postoperative patient's reported outcomes such as pain, nausea and vomiting are common and distressing problems occur after anesthesia and abdominal surgery that result in patient discomfort and prolonged stay in the hospital. Patient satisfaction after anesthesia and abdominal surgery is significantly reduced when Postoperative Nausea and Vomiting (PONV) occurs. Reported incidence of PONV varies from 20-30%, but may be as high as 70-80% depending on surgical and patient factors[4]. In addition PONV may lead to electrolyte imbalance, wound dehiscence and pulmonary aspiration[5].

Postoperative pain results from surgical trauma and is a significant challenge for healthcare providers. About 75% of patients experience moderate or severe pain following surgery[6]. The mainstay of treating postoperative pain is the use of opioids analgesics. However, these drugs are associated with a number of undesirable side effects which can delay patient recovery including nausea, vomiting, dizziness, sedation, and decreased gut motility. The use of customized strategies for administering analgesic as patient controlled analgesia is designed to reduce consumption of opioids analgesics and have resulted in better pain control. However, even with individualized pharmacological approaches for treating postoperative pain, the side effects of opioids analgesics remain high [7]. However, due to the complications of current pharmacological therapies, the use of non-pharmacological methods are currently receiving special attention [8].

The complementary and alternative medicine has become one of the fastest growing remedial approaches among patients and health care providers worldwide. It has already achieved very distinctive reliability and eminence outside territory of traditional medicine system due to their various therapeutic attributes. Acupressure is non-pharmacological treatments which are highly regarded currently and often used for the treatment of pain, nausea and vomiting[9].

According to Traditional Chinese Medicine theory, a core tenet of acupressure is that a person's health depends on the balance of energy (or cosmic life force, which is called "Qi" in Chinese) in the body and the overall energy levels. The body's energy flows in channels, called meridians, through the manipulation of these meridians body energy balance can be restored. Acupressure involves the practice of applying gentle but firm finger pressure for five to 15 minutes to specific points, called acupoints, located on the human body [10].

Surgery interrupts the balanced state of the human body by disturbing the movement of both energy flow and blood, leading to stomach going upward to cause nausea and vomiting. Stimulation of the Neiguan PC6, which is one of important acupoints on the Hand-Jueyin pericardium meridian, is suggested to mitigate PONV after surgery by regulating the function of the stomach. PC6 acupoint is located three finger breadths below the wrist joint of the dominant arm.[11][12].

One of the important acupoints in the body is LI4 which belongs to the Large Intestine Meridian of Hand-Yangming and proved to be associated with analgesic and sedative effect[12]. It is located on the dorsum of the hand, between the first and second metacarpal bones, between the thumb and the index finger. Acupoints are stimulated by continuous, mild pressure with fingertips and thumbs[13]. Stimulating this point with pressure triggers the release of endorphins, which are the neurochemicals that relieve pain. As a result, pain is blocked and the flow of blood and oxygen to the affected area is increased. This causes the muscles to relax and promotes healing. Because acupressure inhibits the pain signals sent to the brain through a mild, fairly painless stimulation, it has been described as closing the "gates" of the pain-signaling system, preventing painful sensations from passing through the spinal cord to the brain[14].

A systematic review suggested that a number of clinical studies have evaluated the efficacy of acupuncture and acupressure as adjuvant treatment for postoperative pain, numerous studies have found it is safe compared to routine care[7]. Acupressure therapy may be potentially beneficial in improving postoperative symptoms like postoperative pain, nausea and vomiting and improving postoperative quality of recovery [15].

However in their meta-analysis, Bae et al. suggested that further studies should be done in this field [16]. Despite numerous studies in this area, controversy still exists regarding the effect of acupressure. A little research was done in

Egypt investigating the effect of acupressure on patient's reported outcomes such as postoperative pain, nausea and vomiting in patients with abdominal surgery. Therefore the aim of this study was to evaluate the effect of acupressure therapy upon post-operative nausea, vomiting and the overall surgery pain experience, among patients underwent abdominal surgery.

Significance of the study:

Postoperative pain, nausea and vomiting remain significant problems in the modern day anaesthesia and surgery practice. It is continued to be a highly undesirable outcome of anesthesia and surgery [17]. Avoiding pain and PONV is highly prioritized and not only has major impact on quality of care but it also delaying discharge and may cause unanticipated admission. PONV may also on rare occasions lead to dehydration; hypovolemia compromising safety [18].

Despite multimodal pharmacologic treatments available and optimal, adequate emetic and pain management of postoperative complications of abdominal surgery as pain, nausea, vomiting and retching, these symptoms continue to be occurred. Patients with abdominal surgery may be having long exposure to general anesthesia and higher doses of opioids. Moreover extensive use of opioids is associated with delayed resumption of normal activities of daily living for surgical patients [9]. Strategies to minimize the use of pharmacological treatment should be considered for abdominal surgery patients.

Nowadays, the awareness of an interest in complementary and alternative medicine is increasing globally. It is in this situation that the effectiveness of the non-pharmacological method as acupressure in controlling postoperative problems for patients with abdominal surgery gains the attention of the health professionals. Nurses are in a better position to evaluate the effects, and provide information regarding alternative methods to improve postoperative patient's reported outcomes as pain, nausea and vomiting. It is also hoped that this work provide the health care professionals with evidence based nursing practice that might improve delivered patient care regarding this controversial issue .

II. RESEARCH METHODOLOGY

Aim

The aim of the current study was to evaluate the effect of acupressure therapy upon post-operative nausea, vomiting and the overall surgery pain experience, among patients underwent abdominal surgery.

Research Questions

To fulfill the aim of the current study, the following research questions were formulated:

1. Are there any differences in the severity of nausea and vomiting mean scores between the intervention and the control group throughout the study period?
2. Are there any differences in duration of nausea and vomiting between the intervention and the control group throughout the study period?
3. Are there any differences in the frequency of nausea and vomiting between the intervention and the control group throughout the study period?
4. Are there any differences in the severity of pain mean scores between the intervention and the control group throughout the study period?

Research design

A quasi-experimental pretest-posttest nonequivalent control group design was utilized to study the effect of the independent variable (acupressure therapy) on the dependent variables (postoperative pain, nausea and vomiting).

Setting

The current study was conducted in general surgery wards, at one of the teaching hospitals affiliated to Cairo University, Egypt.

Subject

Convenient samples of 60 patients underwent abdominal surgery were recruited in the current study. The total sample size was calculated according to G power 3.1 with 90% of statistical power, 95% confidence interval, 5% level of significance and 10% proportion of attrition.

Inclusion criteria:

- Adult, male or female with an age ranged between 18 – 60 years.
- Post-operative patient undergone abdominal surgery with general anesthesia.
- Physical health status grades I & II according to American Society of Anesthesia (ASA).
- Willing to participate in the study.

Exclusion criteria:

- Any disturbance precluding complete cooperation,
- Patients who developed complications during surgery, and/or the period of recovery from anesthesia.
- A history of upper limbs amputation (precluding ability to apply acupressure treatment).
- Any neurologic condition which precludes sensation in both upper extremities.
- Serious skin diseases (e.g dermatitis, burn, skin breakdown, ulcers, cellulitis, broken bone, and indwelling catheter) within the hand or 5 cm radius near the location of acupoints.
- Regional anaesthetic technique, e.g. epidural, spinal, for one day postoperative.

Subjects were randomly assigned to either a control group receiving standard postoperative care or to the experimental group receiving additional acupressure at the predetermined acupoints. This procedure was carried out through allocation of the study participants to different days of week.

Study Period

Data collection phase was conducted from November 2016 and extended up to august 2017 in the targeted hospital.

Tools for data collection:

In order to achieve the aim of the current study, three tools were utilized as follows:

1. Demographic and medical data sheet: It was developed by the researchers based on extensive literature review. This tool is consisted of two parts. Part I; included patient's demographic data as age, gender, marital status, occupation and educational level. Part II; composed of patient's medical data regarding; medical diagnosis, type of surgery, extent of surgery, preexisting major medical conditions , ASA physical status grade I (normal healthy patient) or Grade II (patient with mild systemic disease).

2. Rhodes Index of Nausea and Vomiting scale: this designed to measure the severity, frequency and distress of nausea and vomiting. It is an eight-item instrument that uses a five-point Likert scale giving a total of 32 grade [19]. The scoring of its items ranged from (0) for the least amount of distress to (4) for the most distress. The English versions of this instrument were translated into Arabic and back translated into English to ensure equivalency. Validity of the Arabic version was tested through a jury for both English and Arabic version for matching by introducing them for five medical surgical nursing expertise. Reliability of our translated version tested by test retest reliability testing on ten patients and Pearson correlation was 0.82.

3. A Visual Analogue Scale (VAS) [20]: used by the researchers to assess the severity of pain before and after intervention. It is a self-reported 10 cm straight line which represents the pain intensity, the two opposite ends representing no pain to pain as bad as it could be in between these two phrases, words like: Slight pain, mild pain, moderate pain, severe pain, and very severe pain are assigned to each 2 cm distance respectively. Participants were asked

to place a mark on the 10-cm line, at a point that corresponded to the level of pain intensity that they felt at time of enquiry. The distance in centimeters from the no pain (left-hand) end of the VASP to the participant's mark was used as a numerical index of the severity of pain experienced.

Content validity & Reliability:

To guarantee the content validity of tool (1), it was revised and approved by board of five specialists in medical surgical nursing; they accept it with minimal comments. Internal consistency among the questionnaire items was evaluated the tool is reliable at 0.79 using Cronbach's alpha. Tools (1 and 2) were valid and reliable. But as it was performed on different sample & different language the researchers found that it was crucial to re-test its reliability and there were reliable at Cronbach's $\alpha = 0.90, 0.86$.

Ethical consideration

An official permission was obtained from the director of the department in which the study was conducted. Prior to conducting the study, each potential patient was fully informed with the purpose and nature of the study, and then informed consent was taken from the patients. In addition, the researchers emphasized to each patient that participation in the study is entirely voluntary; anonymity and confidentiality were assured through coding of data, yet, withdrawal from the study is permitted as it is one of their rights without any penalty.

Pilot study:

Once permission was granted to proceed with the proposed study, a pilot study was carried out before starting data collection on six of targeted patients to evaluate the clarity, feasibility and applicability of the tools as well as estimate the time needed to collect data. No tool modification was needed. Data which obtained from the pilot study was excluded from the study results.

Procedure of the study:

An official permission to carry out the study was granted from the head manager of the surgical departments at the university hospital to proceed with the study. One day preoperative, patients who met the inclusion criteria were approached individually. The researchers explained the purpose of the study and all ethical considerations were clarified to the patients. Then those who agreed to participate were recruited. After that, the participants were randomly assigned either to the study group who will receive acupressure or control group who will receive routine care using random assignment. At this point tool (1) was filled out by interviewing the patient and from the patient medical records for both groups and it takes around 10-15 minutes.

In the intervention group, acupressure therapy will consist of unilateral thumb pressure application on the following acupoints: Neiquan PC6, then LI4. PC6 is two patient interphalangeal thumbs width proximal to the anterior wrist crease between the flexor carpi radialis and palmaris longus, LI4 is at the center between the 1st and 2nd metacarpal bones (Figure1). All selected acupoints were stimulated bilaterally. The therapy was applied at each acupoint for five minutes then approximately one minute rest in between. The applied intensity was adjusted according to the patient's level of tolerance.

By using a circle massage movement and after locating the PC6, LI4 points, gently massage a single point at a time whilst staying on the point or applying steady pressure. PC6 point massaged first then LI4. Pain should be avoided on the patient, but the patient will often report a feeling that could be described as a strong pressure or a "good and gentle hurt" sensation. Instruct the patient to take few deep and slow breaths, tell them to relax, and close their eyes. The intervention group received each session lasted for around 25 minutes. Two research coordinator members performing interventions trained to perform a standardized pressure defined by an expert acupressure therapist.

The intervention (acupressure) will start at the first postoperative day immediate after surgery at the recovery room and when the patient is completely conscious and before applying acupressure technique tool (1 and 2) will be filled out as a base line assessment. Then the intervention will be applied for the intervention group for the first time then 4 and 8 hours after surgery during the first day while the control group will be exposed to the routine care only. At this point tool (2 and 3) will be filled again for both the intervention and control group for further comparison.

In study day two and three the acupressure will be performed three times a day in: between 9:00 am, 2:00 pm by the researchers, and 7:00 pm, at this point tool (2and3) will be filled again on the second and third day postoperative for both groups. Interventions will be terminated only on patient request or if an exclusion criterion later occurs. In the control group, no visit will be performed except for the endpoints assessment. All patients will receive standard regular care. To minimize potential confounders, variables such as age, sex, co-morbidities, type of surgery, type of anaesthesia, type of anaesthetic agents, prophylactic antiemetic will be recorded. The time taken by the patients to complete all the tools was approximately from 15 minutes.

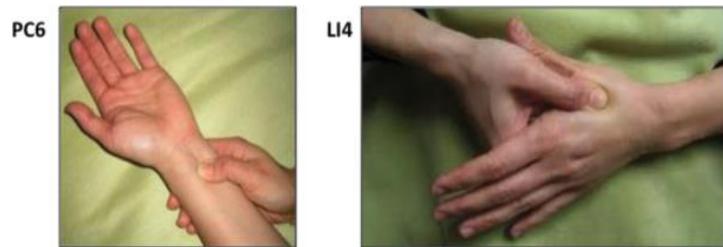


Figure (1): Selected Acupoint in acupressure group. PC6 and LI4 acupoint locations[15].

Statistical Analysis:

Data was entered and analyzed using Statistical Package for Social Science software (SPSS version 22); Data related descriptive statistics were summarized using mean as an average, standard deviation as a measure of dispersion of result around the mean. Also frequency and percentage of for each variable studied. In order to compare means between groups, t-test as well as ANOVA test was used. The alpha level of .05 was utilized for all tests of significance. The internal consistency of all tools was conducted by Cronbach alpha. Data was presented using descriptive statistics in the form of frequencies and percentage. T-test was utilized as an inferential statistics to compare means between study and control groups in relation to research variables. Statistical significance was considered at P-value $p \leq 0.05$.

III. RESULTS

Results of the study are presented in two parts; the first part presented data pertaining to demographic and medical related data and the second part presented the answer of research questions.

Part I: Demographic and medical related data.

Table (1): Percentage and distribution of demographic characteristics among the studied groups (n=60)

Variables	Study group		Control group		X ² /test-t	value-p
	n=30	%	n=30	%		
Age						
35 > 20	7	%23.3	9	%30	t-test 1.85	0.92
50 > 35	13	%43.4	11	%36.7		
65 ≥ 50	10	%33.3	10	%33.3		
Gender						
- Female	15	%50	15	%50	0	0
- Male	15	%50	15	%50	0	0
Occupation						
- Employee	8	26.7	9	%30	0.43	0.93
- Hand craft	12	%40	9	%30		
- House wife	10	%33.3	12	%40		
Operation Time						
hours 3 < 2	16	%53.3	16	%53.3	t-test 0.55	0.64
hours 4 < 3	14	%46.7	14	%46.7		
Mean±SD	2.65±0.50		2.70±0.64			

Table (1) shows that (43.4%) of the study and (36.7%) of the control group participants had age range from 35 to less than 50 years, with an equal percentage of male and female in both groups. In addition, (53.3%) of the study and control group participants had a an operation time ranged from 2 to less than 3 hours and (46.7%) had a 3 hours to less than 4 hours.

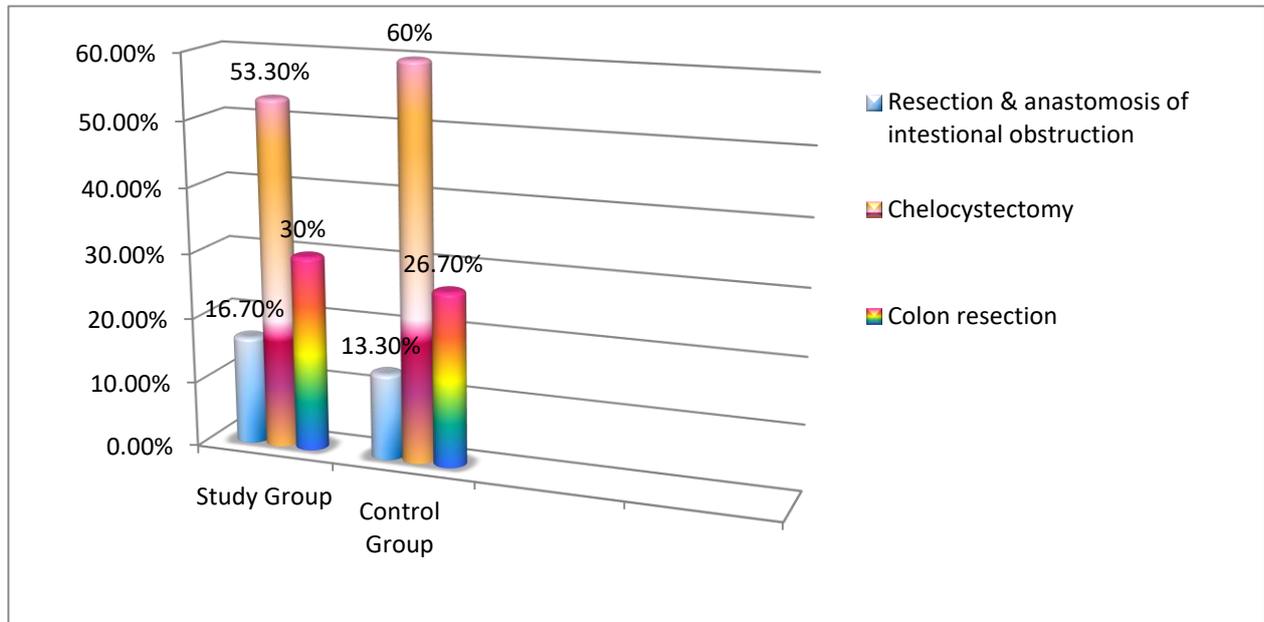


Figure (2) Percentage and Distribution Regarding Types of Abdominal Surgery among the Studied Groups (n=60)

Regarding diagnosis, figure (2) illustrates both study & control group participants had resection & anastomosis of intestinal obstruction, open cholecystectomy and partial colon resection (53.30% 30 % 16.70%) and (60.% 26.70% 13.3%) respectively. The study and control group participants were to be homogeneous group as there was no statistical significant difference between both groups in relation to demographic characteristics and bio-medical data.

Part II: Answering the Research Questions:

Table (2): Severity of Nausea & Vomiting Mean Scores during the First Three Days Postoperative among the Studied Groups (n=60).

Days	Groups	X ± SD	t-test	p-value
Base Line	Intervention	9.4 ±7.00	0.65	0.12
	Control	9.1 ±7.21		
1 st day	Intervention	5.65±3.03	3.34	0.005*
	Control	9.9 ±6.69		
2 nd day	Intervention	6.45±2.45	2.14	0.01*
	Control	7.95±4.09		
3 rd day	Intervention	3.92±2.1	1.92	0.08
	Control	6.88±4.35		

Significant p value ≤ 0.5*

Regarding severity of nausea and vomiting table (2) illustrates that , there was no statistically significant difference between the intervention and control group in the base line mean scores (t-test= 0.65, p-value= 0.12). While, the mean scores were significantly lower among the intervention group than the control group in the first and second day postoperative, whereas t-test= 3.34, p-value= 0.005and t-test= 2.14, p-value= 0.01 respectively.

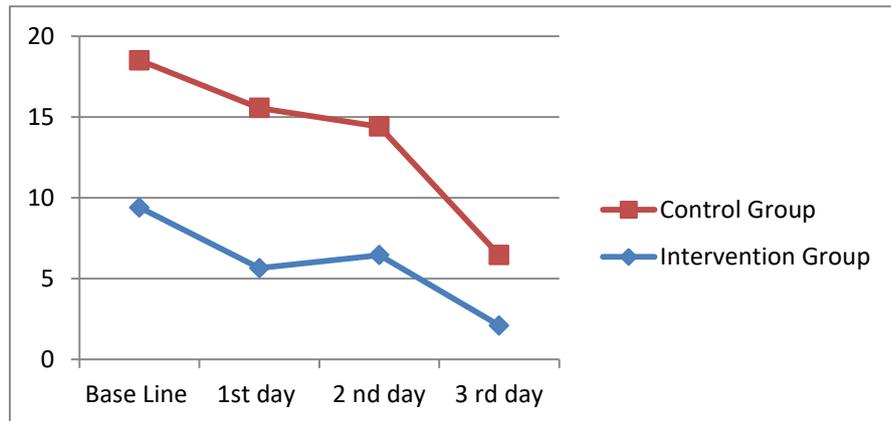


Figure (3): Severity of nausea and vomiting during the first Three days postoperative among the studied groups.

Table (3): Duration of Nausea & Vomiting Mean Scores during the First 3 Days Postoperative among the Studied Groups (n=60).

Days	Groups	X ± SD	t-test	p-value
Base Line	Intervention	1.61±0.89	0.12	0.81
	Control	1.47±0.94		
1 st day	Intervention	2.53±1.74	2.76	0.01*
	Control	4.29±3.32		
2 nd day	Intervention	1.47±0.93	2.97	0.001*
	Control	2.35 ±2.27		
3 rd day	Intervention	1.66±0.94	0.17	0.76
	Control	1.52 ±0.99		

Significant p value ≤ 0.5*

Regarding duration of nausea and vomiting table (3) illustrates that , there was no statistically significant difference between the intervention and control group in the base line and third day mean scores (t-test= 0.12, p-value= 0.81 and t-test= 0.17, p-value= 0.76 respectively). While, the mean scores were significantly lower among the intervention group than the control group in the first and second day postoperative, whereas t-test= 2.76, p-value= 0.01and t-test= 2.97, p-value= 0.001 respectively.

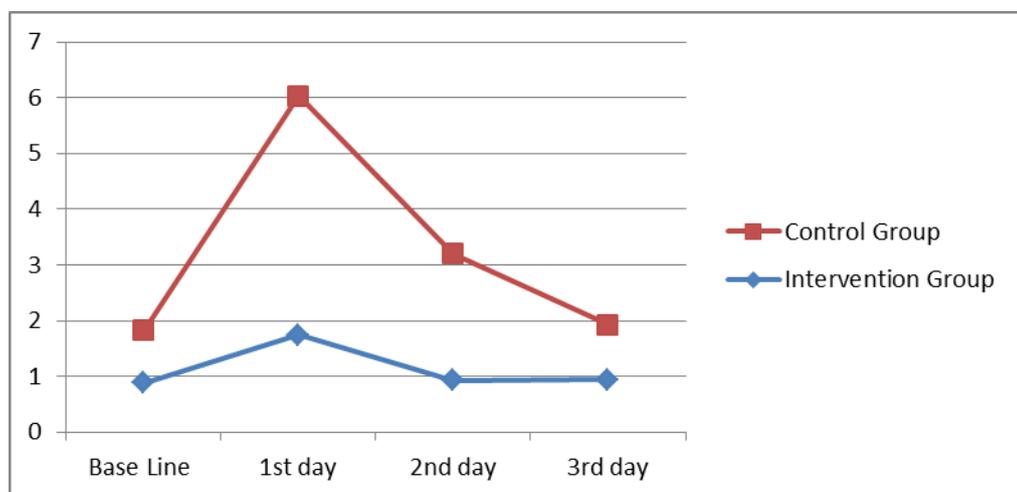


Figure (4): Duration of Nausea & Vomiting Mean Scores during the First 3 Days Postoperative among the Studied Groups (n=60).

Table (4): Comparison of total numbers of occurrence of nausea, vomiting, and retching between the study and control group during the first 3 days postoperative (n=60).

symptom	Intervention Group X ±SD	Control Group X± SD	test-t	P-Value
Nausea	6±0.14	15±0.50	3.28	0.05*
Vomiting	1±0.02	15±0.68	7.91	0.01*
Retching	3±0.06	4±0.18	0.77	1.02

Significant p value ≤ 0.5*

In relation to the occurrence of patients' reported symptoms of nausea, vomiting & retching table(4)revealed a statistically significant difference between the intervention and control group as regards nausea and vomiting (t-test= 3.28, p-value= 0.05 & t-test= 7.91, p-value= 0.01 respectively). Meanwhile, there was no significant difference between the intervention group and the control group in relation to retching (t-test= 0.77, p-value= 1.02).

Table (5) Severity of pain mean scores during the first 3 days postoperative among the studied groups (n=60).

Days	Groups	X ± SD	t-test	p-value
Base Line	Intervention	9.2 ±7.00	0.78	1.03
	Control	9.4 ±7.01		
1 st day	Intervention	3.76±2.06	2.60	0.05*
	Control	7.60±0.66		
2 nd day	Intervention	2.10±1.04	3.28	0.01*
	Control	6.99±1.13		
3 rd day	Intervention	2.06±1.70	2.94	0.05*
	Control	5.55±1.93		

Significant p value ≤ 0.5*

Table (6):One Way Repeated Measures ANOVA for Comparison of Pain intensity Mean Scores between the Study and Control group through the First 3 days Postoperative (n=60).2.06 1.70

Variable	1 st day		2 nd day		3 rd day		F- ratio	p-value
	Intervention Group X ± SD	Control Group X ± SD	Intervention Group X ± SD	Control Group X ± SD	Intervention Group X ± SD	Control Group X ± SD		
Pain	3.76±2.06	7.60±0.66	2.10±1.04	6.99±1.13	2.06± 1.70	5.55±1.93	50.28	0.000

*Significant p value ≤ 0.5

With reference to pain intensity mean scores table (6) depicted a decreasing pattern in the mean score with statistically significant difference between the intervention and control group throughout the three first days postoperative (F-ratio = 50.28, p-value= 0.000).

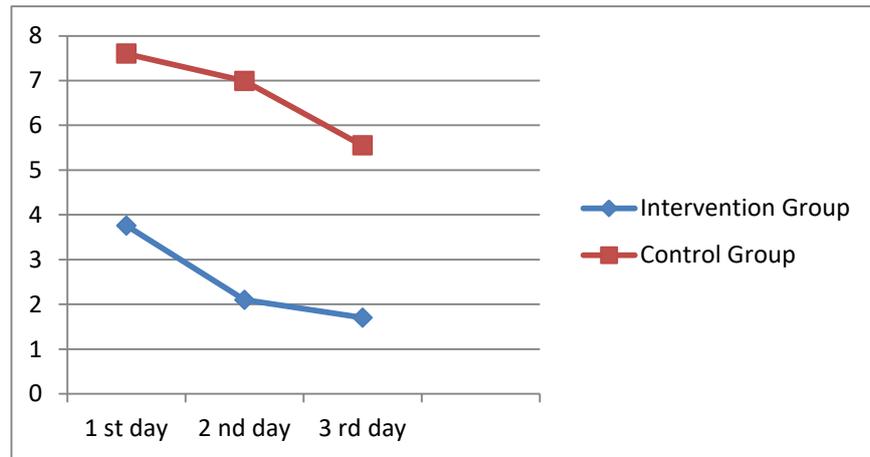


Figure (5): Pain intensity during the first 3 days postoperative among the studied groups (n=60).

IV. DISCUSSION

Postoperative nausea and vomiting, in addition to pain continue to be a highly undesirable outcome of anesthesia and abdominal surgery. The incidence of PONV may be as high as 60–70%. Side-effects and the high costs of antiemetics and analgesics have led many practitioners to investigate alternatives or non-pharmacological methods as acupressure for minimizing postoperative nausea, vomiting and pain [17]. The aim of the current study was to evaluate the effect of acupressure therapy upon post-operative nausea, vomiting and the overall surgery pain experience, among patients with abdominal surgery.

In the current study the intervention and the control groups were matched in the demographic characteristics and medical data, and there was no statistical significant difference between both groups in relation to those variables. Congruently [21] in their study displayed that the intervention and the control groups were demographically comparable. In a comparative study of Pc6 acupressure versus antiemetic to prevent PONV, it was found that the two study groups were not significantly different with respect to patient characteristics. They had comparable duration of anesthesia and surgery. Patients in both groups underwent a standardized anesthetic technique [4]

The results of the demographic and medical data in the present study revealed that, patients in both groups were homogenous and there was no statistically significant difference between the two groups which control extraneous variables that might interfere with the explanation of the study results. Therefore, the difference in control of PONV and pain may reasonably be attributed to the intervention done.

Pertaining to severity, duration of nausea and vomiting the current study results disclosed that there was no statistically significant difference between the intervention and control group in the base line mean scores. While, the mean scores were significantly lower among the intervention group than the control group in the first and second day postoperative. In relation to the occurrence of patients' reported symptoms of nausea, vomiting & retching there was a statistically significant difference between the intervention and control group as regards nausea and vomiting. Meanwhile, there was no significant difference between the intervention and the control groups in relation to retching. The researchers confirmed that the two groups were demographically and medically comparable and it is believed that the reason for this difference is the effect of acupressure.

Correspondingly in Ming et al., highlighted that acupressure is effective in reducing the severity and incidence of post-operative nausea and vomiting within the 24 hours following the surgery [22]. Another study showed that Pc6 acupressure is equally efficacious and may be more cost effective for preventing PONV than Ondansetron which is one of first line drugs for prophylaxis of PONV with minor adverse effects however it is costly [4]. In addition Meta-analyses were performed on PONV and the results indicated that acupressure could significantly decrease the risk of PONV among patients with abdominal surgery [23]. Referring to RCT by Ünülu and Kaya publicized that although PC6 acupressure was

effective at preventing vomiting, its effect on nausea intensity was even better. Also, the PC6 acupressure enhanced patient comfort. Moreover they concluded that, because of its effectiveness and feasibility, PC6 acupressure is a great alternative to pharmacologic methods in the gynecologic surgery population [24].

These findings are in sharp contrast with a study investigating the efficacy of Pc6 acupressure with sea-band in reducing postoperative nausea and vomiting in patients undergoing craniotomy found that there was no significant effect from Pc6 acupressure [25]. One more study speaking the same language stated that single bolus dose of Palonosetron which is potent but costly antiemetic is very effective for prophylaxis of PONV with longer duration of action and minimal side-effects than acupressure. Nevertheless it was observed that acupressure also decreases incidence of PONV. As it is non-pharmacological, noninvasive, inexpensive and without any side-effect it can be recommended as an alternative measure for prophylaxis of postoperative nausea and vomiting in laparoscopic surgery [17].

With respect to pain intensity mean scores the study on hand illustrated a decreasing trend in pain score among the successive measurements with statistically significant difference between the intervention and control group throughout the three first days postoperative. Harmoniously, [26] demonstrated that acupressure at the LI4 point with routine therapies could significantly reduce the pain severity of patients undergoing coronary artery graft surgery when compared with light touch at the same point during the same time period. Consistently a significant differences were found in postoperative pain but not PONV following acupressure in a randomized controlled trial investigating the effect of acupressure on the postoperative comfort of gastric cancer patients [27]. Similarly in a study done by [28] ascertained that the acupressure group had lower incidences of nausea, vomiting and pain as well required fewer rescue antiemetics and analgesics after caesarean delivery.

However [8] did not prove that there was a significant difference in pain intensity between the study and control groups in pain intensity scores immediately, 60, and 120 minutes after application of LI4 acupressure Post-cesarean Section. The current study findings are incongruent with [29] who indicated that acupressure to the Pc6 acupoint was not found to be clinically effective in decreasing postoperative vomiting, pain, antiemetic and analgesic drug requirement in patients who underwent laparoscopic cholecystectomy.

These contradictions in results may be attributed to factors such as variation in subjects, dissimilarity in carrying out the procedure or aiming at the wrong target might also be responsible.

Separately, the potential effectiveness of Pc6 and LI4 acupressure should not be ignored and may be considered especially relevant if an exposure to pharmacological interventions should be avoided.

V. CONCLUSION

In summary, we must be mindful of the role of acupressure therapy in reducing postoperative pain nausea and vomiting. The use of acupressure to reduce the occurrence of post-operative pain, nausea and vomiting more beneficial than spending time contacting the surgical doctor, preparing antiemetics, cleaning the patient and changing the bed sheet. By using acupressure on one hand will minimize the side-effects of the antiemetics and analgesics and on the other hand the relationship between the patient and the nurse will also be improved. Acupressure is a simple, noninvasive, safe, and economical procedure could be learnt and practiced by nurses for improving postoperative reported patient's outcomes by controlling postoperative pain, nausea and vomiting for patients undergoing abdominal surgery.

VI. NURSING IMPLICATIONS AND RECOMMENDATIONS

This study has implications in the field of nursing practice, education and research. Nurses are able to make significant contributions in reducing pain, nausea and vomiting among patients with abdominal surgery: (1) providing nursing professionals with research based nursing intervention and enhancement of independent nursing function; (2) demonstrating the efficacy of acupressure and promoting a clinical application of a culturally based nursing intervention; (3) through acupressure an improvement in patient-nurse relationship is expected; and (4) offering a non-pharmacological method for prevention or treatment of post-operative pain, nausea and vomiting.

Recommendations

1. Further studies are recommended to extend such interventions to other surgical patients undergoing general anaesthesia.
2. Because a self-reporting is subjective, monitoring to obtain objective data in the future is recommended.
3. Further studies are needed to investigate patients acceptance and satisfaction with using the acupressure.
4. Similar study should be replicated in a larger sample size for establishing better generalizations.

ACKNOWLEDGEMENTS

The researchers are extremely grateful to all participants of this research.

REFERENCES

- [1] J. F. Fiore *et al.*, “How Do We Value Postoperative Recovery?: A Systematic Review of the Measurement Properties of Patient-reported Outcomes After Abdominal Surgery,” *Annals of Surgery*, vol. 267, no. 4, pp. 656–669, Apr. 2018.
- [2] University of Virginia Health System, “Helping abdominal surgery patients recover sooner,” www.sciencedaily.com/releases/2013/10/131017093501.htm, 2013. [Online]. Available: <https://www.sciencedaily.com/releases/2013/10/131017093501.htm>. [Accessed: 01-Feb-2019].
- [3] A. J. Norheim, I. Liodden, and T. Alraek, “Acupuncture in ambulatory anesthesia: a review,” *Ambulatory Anesthesia*, p. 79, Sep. 2015.
- [4] B. Sajid, R. K. Raghavan, and S. O. Madhavan, “A COMPARATIVE STUDY TO EVALUATE THE EFFECTIVENESS OF P6 ACUPOINT STIMULATION VERSUS ONDANSETRON FOR PREVENTION OF POSTOPERATIVE NAUSEA AND VOMITING,” *Journal of Evidence Based Medicine and Healthcare*, vol. 3, no. 67, pp. 3644–3648, 2016.
- [5] X. Cao, P. F. White, and H. Ma, “An update on the management of postoperative nausea and vomiting,” *J Anesth*, vol. 31, no. 4, pp. 617–626, Aug. 2017.
- [6] T. J. Gan, A. S. Habib, T. E. Miller, W. White, and J. L. Apfelbaum, “Incidence, patient satisfaction, and perceptions of post-surgical pain: results from a US national survey,” *Current medical research and opinion*, vol. 30, no. 1, pp. 149–160, 2014.
- [7] M.-S. Wu *et al.*, “The Efficacy of Acupuncture in Post-Operative Pain Management: A Systematic Review and Meta-Analysis,” *PLOS ONE*, vol. 11, no. 3, p. e0150367, Mar. 2016.
- [8] S. Ramezani 1, A. Hamidzadeh 2, S. Abdollahpour 1, and A. Khosravi 3*, “Effects of LI4 Acupressure on Post-cesarean Section Pain,” *International Journal of Health Studies*, vol. 2, no. 2, Sep. 2016.
- [9] F. Abadi, F. Abadi, Z. Fereidouni, M. Amirkhani, S. Karimi, and M. Najafi Kalyani, “Effect of Acupressure on Preoperative Cesarean Section Anxiety,” *Journal of Acupuncture and Meridian Studies*, Jul. 2018.
- [10] P. Mehta, V. Dhapte, S. Kadam, and V. Dhapte, “Contemporary acupressure therapy: Adroit cure for painless recovery of therapeutic ailments,” *Journal of Traditional and Complementary Medicine*, vol. 7, no. 2, pp. 251–263, Apr. 2017.
- [11] A. Lee, S. K. Chan, and L. T. Fan, “Stimulation of the wrist acupuncture point PC6 for preventing postoperative nausea and vomiting,” *Cochrane Database Syst Rev*, vol. 11, p. CD003281, Nov. 2015.
- [12] Y. Yao *et al.*, “Transcutaneous Electrical Acupoint Stimulation Improves the Postoperative Quality of Recovery and Analgesia after Gynecological Laparoscopic Surgery: A Randomized Controlled Trial,” *Evidence-Based Complementary and Alternative Medicine*, 2015. [Online]. Available: <https://www.hindawi.com/journals/ecam/2015/324360/>. [Accessed: 30-Oct-2018].

- [13] A. Hamidzadeh, F. Shahpourian, R. J. Orak, A. S. Montazeri, and A. Khosravi, "Effects of LI4 acupressure on labor pain in the first stage of labor," *Journal of Midwifery and Women's Health*, vol. 57, no. 2, p. 133, 2012.
- [14] A. SANDRA, "Effect of Acupressure on Glycated Hemoglobin and Lipids Profile in Type 2 Diabetic Women," *Medical Journal Cairo University*, vol. 84, no. 2, pp. 69–75, 2016.
- [15] E. Noll *et al.*, "Randomized trial of acupressure to improve patient satisfaction and quality of recovery in hospitalized patients: study protocol for a randomized controlled trial," *Trials*, vol. 18, no. 1, Dec. 2017.
- [16] H. Bae, H. Bae, B.-I. Min, and S. Cho, "Efficacy of Acupuncture in Reducing Preoperative Anxiety: A Meta-Analysis," *Evidence-Based Complementary and Alternative Medicine*, 2014. [Online]. Available: <https://www.hindawi.com/journals/ecam/2014/850367/abs/>. [Accessed: 07-Nov-2018].
- [17] S. Naik, S. Kujur, M. Debbarma, and M. G. Murthy, "Comparative study of acupressure wristband versus palonosetron for prophylaxis of postoperative nausea and vomiting in elective laparoscopic cholecystectomy under general anaesthesia," *International Journal of Research in Medical Sciences*, vol. 5, no. 1, pp. 96–100, 2017.
- [18] E. Öbrink, P. Jildenstål, E. Oddby, and J. G. Jakobsson, "Post-operative nausea and vomiting: Update on predicting the probability and ways to minimize its occurrence, with focus on ambulatory surgery," *International Journal of Surgery*, vol. 15, pp. 100–106, Mar. 2015.
- [19] V. A. Rhodes, P. M. Watson, M. H. Johnson, R. W. Madsen, and N. C. Beck, "Patterns of nausea, vomiting, and distress in patients receiving antineoplastic drug protocols.," in *Oncology Nursing Forum*, 1987, vol. 14, pp. 35–44.
- [20] N. Crichton, "Visual analogue scale (VAS)," *J Clin Nurs*, vol. 10, no. 5, pp. 706–6, 2001.
- [21] L. Lee, T. Tran, N. E. Mayo, F. Carli, and L. S. Feldman, "What does it really mean to 'recover' from an operation?," *Surgery*, vol. 155, no. 2, pp. 211–216, Feb. 2014.
- [22] J.-L. Ming, B. I.-T. Kuo, J.-G. Lin, and L.-C. Lin, "The efficacy of acupressure to prevent nausea and vomiting in post-operative patients," *Journal of advanced nursing*, vol. 39, no. 4, pp. 343–351, 2002.
- [23] Y. Liu, W. P. Y. Tang, S. Gong, and C. W. H. Chan, "A Systematic Review and Meta-Analysis of Acupressure for Postoperative Gastrointestinal Symptoms among Abdominal Surgery Patients," *Am. J. Chin. Med.*, vol. 45, no. 06, pp. 1127–1145, Jan. 2017.
- [24] M. Ünülü and N. Kaya, "The Effect of Neiguan Point (P6) Acupressure With Wristband on Postoperative Nausea, Vomiting, and Comfort Level: A Randomized Controlled Study," *Journal of PeriAnesthesia Nursing*, vol. 33, no. 6, pp. 915–927, Dec. 2018.
- [25] I. Nilsson, Å. Karlsson, L. Lindgren, T. Bergenheim, L.-O. Koskinen, and U. Nilsson, "The Efficacy of P6 Acupressure With Sea-Band in Reducing Postoperative Nausea and Vomiting in Patients Undergoing Craniotomy: A Randomized, Double-blinded, Placebo-controlled Study," *Journal of Neurosurgical Anesthesiology*, vol. 27, no. 1, p. 42, Jan. 2015.
- [26] M. Narimani, A. Ansari Jaberi, T. Negahban Bonabi, and T. Sadeghi, "Effect of Acupressure on Pain Severity in Patients Undergoing Coronary Artery Graft: A Randomized Controlled Trial," *Anesth Pain Med*, vol. 8, no. 5, Oct. 2018.
- [27] W.-T. Hsiung, Y.-C. Chang, M.-L. Yeh, and Y.-H. Chang, "Acupressure improves the postoperative comfort of gastric cancer patients: A randomised controlled trial," *Complementary Therapies in Medicine*, vol. 23, no. 3, pp. 339–346, Jun. 2015.
- [28] N. Y. Ahn and H.-J. Park, "Effects of Korean hand acupressure on opioid-related nausea and vomiting, and pain after caesarean delivery using spinal anaesthesia," *Complementary Therapies in Clinical Practice*, vol. 28, pp. 101–107, Aug. 2017.
- [29] S. Yilmaz Sahin, E. Iyigun, and M. F. Can, "Effect of acupressure application to the P6 acupoint before laparoscopic cholecystectomy on postoperative nausea-vomiting: A randomized controlled clinical study," *International Journal of Nursing Studies*, vol. 87, pp. 40–48, Nov. 2018.