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acupressure to decrease postoperative nausea and vomiting compared to ondansetron in Women undergoing laparoscopic surgery

frances Noziere
fnozi001@fiu.edu

fernando Alfonso
Florida International University, falfonso@fiu.edu

Robert Dillon
Florida International University, rdillon@drivinghp.com

Acupressure to Decrease Postoperative Nausea and Vomiting (PONV) Compared to Ondansetron in Women undergoing Laparoscopic surgery

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By

Frances Noziere MSN, RN

Supervised By

Fernando Alfonso DNP, CRNA, APRN

Robert Dillon , DNP, CRNA, APRN

Approval Acknowledged DocuSigned by: Ann Miller A986D8685093471..., DNA Program Chair

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Approval Acknowledged: DocuSigned by: 27267E9FF76F460..., DNP Program Director

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Abstract

Background:

The discovery of anesthesia has dramatically transformed modern medicine by eliminating pain from surgery.[1] One of the common negative occurrences following surgery is postoperative nausea and vomiting. PONV happens in the majority of patients with at least one risk factors and results in discomfort, patient dissatisfaction, delayed recovery, increased hospital costs due to prolonged postoperative hospital stay and other associated comorbidities.[4] One of the advantages of laparoscopic surgery with no major complications is minimal scarring and the overall quick recovery time.[1,2,]

Method:

This study proving the efficacy of acupressure will be conducted through comprehensive literature using Medline (ProQuest), Excerpta Medica Database (EMBASE), and Cumulative Index of Nursing and Allied Health Literature (CINAHL). This review will be conducted using a combination of search words and Boolean operators to find literature reporting the research on acupressure as a valid treatment to treat PONV in women having laparoscopic surgery.[7,8] The setting for this project is through Florida International University's DNP program guidelines and conducted at a level 1 trauma center and one of the top 10 most significant public health systems in the United States. The participants of this project involve interested parties such as CRNAs, anesthesiologists and anesthesiology residents. Each stakeholder will actively participate, either through this review, educational presentation, and other needed tasks.

Results:

The post-test demonstrated an overall significant progress in different areas of P6 acupressure methodology. Participants' knowledge improvement ranged from 7% to 81% in all areas of the project which was built on providing education about the efficacy of this complementary therapy. Conclusively, the post-test demonstrated an increase of 48% anesthesia providers willing to utilize this therapy. There was also a decrease of 30% in individuals who were indifferent and in 10% in individuals who previously reported they would not recommend this treatment to their patients.

Discussion:

This project successfully displayed the study participants 'willingness in utilizing P6 acupressure when treating PONV, and successfully encouraged participants to expand their knowledge about administration of this treatment. There is a continued hope that this anesthesia providers will recommend and educate patient about this complementary therapy so that it can be implemented across facilities nationwide.

Keywords:

Acupressure, Postoperative nausea and vomiting, PONV women undergoing laparoscopic procedure, alternative to Zofran, ondansetron, P6 Neiguan point.

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Introduction

Problem Identification

Anesthesia providers recognize the significance of PONV and have shed a light on finding out more about this debilitating complex occurrence to further develop clinical guidelines as preventive and treatment measures.[3] Common management of PONV include ondansetron, a 5-hydroxytryptamine ($5\text{-}HT_{3)}$ antagonist.[4] $5\text{-}HT_3$ is a serotonin receptor that regulate motility and relays information in the gastrointestinal tract.[4] Management of PONV from antiemetic drugs administered prophylactically and postoperatively bring on their own side effects such as unwanted sedation and fatigue, headache and constipation.[5]

In addition, pharmacological options can be short lived and costly for patients. Studies dated in the 1990s yielded data about the risk factors of this postoperative complication and revealed that three types of factors affect incidences of PONV: Patient, surgical and anesthesia factors.[9] Patient factors include post pubescent women being the single strongest demographic for PONV, patients who have a history of motion sickness.[4,5] Additionally, non-smokers are more prone to PONV due to smokers' chemoreceptor trigger zone (CTZ) being desensitized. CTZ is one of the pathways participating in the pathogenesis of understanding the stimulation of emesis.[5] Other patient factors linked to increased PONV incidences are obesity, patients with conditions such as diabetes and hypothyroidism.

Surgical factors include lengthy surgical procedures and types of surgeries such as laparoscopic surgeries.[4,5] Anesthesia factors include general anesthesia that incited significantly more risk of PONV versus regional anesthesia. Other risk factors included postoperative pain management with the use of opioids, history of PONV, and migraines.[5]

Background

PONV remains a prevalent post anesthetic event that results in detrimental effects when it comes to the recovery of postsurgical patients.[1] Currently, prevention and treatment methods call for the prophylactic use of pharmaceuticals such as ondansetron, which in turn is known to cause side effects such as drowsiness, headache, fatigue in postoperative patients.[1,2] PONV is described as vomiting, retching, and nausea within the first 24 hours of surgery in the post-anesthesia care unit (PACU) or at home.[2] The American Association of Nurse Anesthesiology (AANA) reports PONV as a debilitating condition consuming healthcare resources and costs.[3] PONV is commonly managed and treated with ondansetron which is a 5-hydroxytryptamine ($5\text{-}HT_{3)}$ antagonist.[4] $5\text{-}HT_3$ is a serotonin receptor that regulate motility and relays information in the gastrointestinal tract.[4] There is a gap between the current state of management options for this condition and the goal established in this project. The gap refers mainly to a lack of knowledge of the therapeutic effects of acupressure, thus, a lack of research that can lead to evidence-based clinical guidelines to treat PONV.

Scope of the Problem:

PONV remains a highly prevalent and common negative postoperative occurrence, affecting over 80% of high-risk patients and over 30% of all surgical procedures.[4,5,6] The scope of this problem is made more significant due to the seriousness of its symptoms. The recovery of postoperative patients who experience PONV is hindered by complications such as incidences elevated heart rate, increased blood pressure, central venous pressure and intrathoracic pressure.[10] Currently, the method of treatment and prevention of PONV is with pharmaceuticals such as ondansetron, a 5-hydroxytryptamine ($5\text{-}HT_{3)}$ antagonist.[4] $5\text{-}HT_3$ is a serotonin receptor that regulate motility and relays information in the gastrointestinal tract.[4] Management of PONV from antiemetic drugs administered prophylactically and postoperatively bring on their own side effects such as unwanted sedation and fatigue, headache and constipation.[5] In addition, pharmacological options can be short lived and costly for patients. Studies dated in the 1990s yielded data about the risk factors of this postoperative complication and revealed that three types of factors affect incidences of PONV: Patient, surgical and anesthesia factors.[5] Patient factors include post pubescent women being the single strongest demographic for PONV, patients who have a history of motion sickness.[4,5]

Additionally, non-smokers are more prone to PONV due to smokers' chemoreceptor trigger zone (CTZ) being desensitized. CTZ is one of the pathways participating in the pathogenesis of understanding the stimulation of emesis.[5] Other patient factors linked to increased PONV incidences are obesity, patients with conditions such as diabetes and hypothyroidism. Surgical factors include lengthy surgical procedures and types of surgeries such as laparoscopic surgeries.[4,5] Anesthesia factors

include general anesthesia that incited significantly more risk of PONV versus regional anesthesia. Other risk factors included postoperative pain management with the use of opioids, history of PONV, and migraines.[5]

Consequences of the Problem:

The consequences of not addressing the high incidence of PONV weigh heavy on patients and medical facilities. Patients suffer the debilitating effects of this clinical issue brought on by dehydration, fluid and electrolyte imbalance, pulmonary aspiration, wound dehiscence, delayed recovery and room discharge from the hospital.[5,6] These complications put patients at risk for chronic, debilitating, and costly postoperative complications.[5] Patients with untreated or mismanaged PONV are at risk for perioperative morbidity, increased costs in hospital readmissions and prolonged stays.[3,4]

Patients suffering from PONV report increased distress from additional symptoms hindering their recovery process, and dissatisfaction from the multitude of postoperative complications related to PONV.[4] Patients will continue to pay the high price of untreated PONV if this issue is not addressed effectively. Studies show that patients anticipating they might have PONV suffer from anxiety, which increases high blood pressure and other postsurgical comorbidities.[4] Pharmacological options including the commonly used ondansetron has not proven efficient in preventing and managing PONV, therefore, health care providers have to look at a multimodal therapy options including non-pharmacological options such as acupressure.[3,4]

Knowledge Gaps:

The knowledge on general management of PONV dictates insuring fluid and electrolyte balance to prevent dehydration, managing oxygenation, continuous

monitoring of blood pressure and administering antiemetics to prevent incidences of nausea and vomiting.[8,9] There is still a knowledge gap on the exact cause of PONV, only of the possible factors that increase the likelihood of PONV and that this condition is related to anesthetics.[6,7] The American Society of Anesthesiologists report current guidelines to increase PONV prevention such as identify individuals who are at high risk for this condition early on, reduce these risk factors utilizing an enhanced recovery pathway with multimodal therapy methods.[9] The current management of antiemetics presents with possible further debilitating side effects that postoperative patients have to contend with including drowsiness, headache, chills, constipation, etc.[4,5] Studies have been conducted to fill this gap on effective treatment methods that yield successful data on efficient prevention and treatment methods of PONV. The studies conducted on acupressure, although have proven promising rates of success as an alternative method, are in their beginning stages and have not filled the knowledge gap that plagues the etiology and effective treatment of PONV.

Proposal Solution:

Research with the goal of developing, implementing and refining new clinical guidelines and evidence-based practice in eradicating such high incidences of PONV has shown that acupressure is an effective prophylactic treatment for this health issue.[10] Acupressure will help to ensure that ambulatory patients who are at higher risk for PONV, with more than one risk factors, such as women, non-smokers and undergoing laparoscopic surgery under general anesthesia will be free of PONV related complications.[9,10] Dr. Sabry Ayab from the Cleveland Clinic's Anesthesiology Institute is

one of the authors of a newly proposed guidelines to help patients who may experience postoperative nausea and/or postoperative vomiting.

Dr. Ayab recommends a personalized hands-on approach with patients that starts with the first preoperative visit.[8,9] Patients 'history documentation should be thorough and any previous PONV history with be flagged and used to create a preventive multimodal therapy with options involving pharmaceuticals as prophylaxis and treatment, and complementary therapies such as acupressure. His goal in proposing these guidelines is to throw every option available at the patient to prevent PONV.[8,9]

The International Anesthesia Research Society proposes an algorithm that focuses on prevention and treatment methods for PONV. These new guidelines state that seek to reduce the patient's baseline risk factors for PONV, assess the efficacy of antiemetics administered for PONV every 6 hours postoperatively and utilize alternative therapies such as acupressure to avoid any sequalae.[10] This proposed solution also takes into consideration the need for further studies reviewing the efficacy of acupressure and for clinical practice guidelines that recommend acupressure as a prophylaxis and treatment plan for high-risk surgical patients.[9,10] These proposed guidelines reinforce the need to establish a proven therapy method that successfully treats and prevents PONV. The added cost and side effects that Antiemetics like ondansetron carries is not the ideal treatment method for patients who already are at high risk for PONV. There is a need for a non-invasive efficient therapy that all patients can opt for without the fear of side effects and worsening symptoms that delay surgical recovery.

The following PICO question was formulated to guide this quality Improvement Project . In women undergoing laparoscopic surgery , does preoperative acupressure in

comparison to ondansetron decrease postoperative nausea and vomiting. Population (P): Women having laparoscopic surgery.

Intervention (I): Acupressure

Comparison (C): Ondansetron

Outcomes (O): Improved PONV

Literature Review

Feng C, Popovic J, Kline R, et al. Auricular Acupressure in the Prevention of Postoperative Nausea and Emesis

Quality, safety, and patient satisfaction are all significantly impacted by successful antiemesis. Postoperative nausea and vomiting (PONV) are a common side effect experienced by patients under general anesthesia. Acupressure provides a first-line antiemetic without any side effects. Acupressure is a preferred substitute for needle acupuncture since patients may find it uncomfortable. It helps reduce PONV.

A prospective, double-blinded, randomized clinical trial was conducted to examine the impact of acupressure on individuals with a history of PONV and motion sickness. Point zero, the subcortex point, and Shen Men were the three auricular acupressure points selected. If the patient complained of ongoing nausea, 4 mg of intravenous ondansetron was given as rescue therapy for PONV. A blinded observer documented data on antiemetic rescue and postoperative analgesic use throughout 24 hours. Results: We eliminated the null hypothesis using univariate analysis. Equal means hypothesis about the intervention group ($p = 0.001$). Pairwise comparisons showed that the test and placebo groups differed ($p = 0.000$), as did the sham and test groups, where age was shown to be ($p = 0.048$) and gender was a significant covariate ($p = 0.003$).

Our findings show that auricular acupressure considerably reduces nausea in the 24 hours following surgery and while in the PACU. It's unclear if as a main result of the intervention, nausea is reduced, as a side effect by lowering the need for drugs. Furthermore, nausea perception may be entirely subjective. This is demonstrated by our findings, which show that participants who were compared to the placebo subjects, sham points performed better.

Hofmann D, Murray C, Beck J, Homann R. Acupressure in Management of Postoperative Nausea and Vomiting in High-Risk Ambulatory Surgical Patients.

This study aimed to examine the effects of acupressure on ambulatory surgical patients who are considered high-risk for postoperative pneumonia by using a randomized, blinded, placebo-controlled design. The study period was 24 hours postoperative. Design: The trial used a randomized, blinded, placebo-controlled methodology. Procedures: Four out of five risk factors—female, motion sickness or PONV history, nonsmoker, and volatile gas general anesthesia were included in the study inclusion criteria, which were established by the American Society of Peri Anesthesia Nurses in their 2006 PONV/post discharge nausea and vomiting guidelines. One hundred ten patients were randomly placed in either an acupressure bead patch intervention (N = 57) or a control group (N = 53) that received sham acupressure patches. On a scale of 0 to 10, the Patient rated PONV. Results: In all three cases, acupressure at P6 before surgery was statistically significant in lowering PONV.

Yilmaz Sahin S, Iyigun E, Can MF. Effect of acupressure application to the P6 acupoint before laparoscopic cholecystectomy on postoperative nausea-vomiting

According to the Johns Hopkins Tool Kit, this article is a level 1 randomized controlled trial (RCT) that uses the specific experimental study methods of randomization, control and manipulation. The authors performed an experimental study design where they utilized block randomization to randomly assign patients to each of the three group (control, non-intervention and intervention groups).[1] The authors gave the control group a placebo or a non-working treatment, the intervention group received the adequate treatment, and the non-intervention group received no treatment.[1] The experimental study method used a longitudinal qualitative data because the goal of the study is to find out the effect of acupressure in the prevention of PONV and the need for antiemetic medications.[1]

The title accurately describes the article in that the authors sought out to investigate how acupressure affects the P6 acupoint to prevent PONV after laparoscopic surgery. The experiment conducted and the results only addressed the statement posed in the title.[1] The abstract represents the article because it provides a summary of each of the section (background, objectives, design, setting, participants, methods, results and conclusion) developed by the authors throughout the study.[1] The introduction provided background information where the author introduced the problem and explained the reason the study is being conducted. Yilmaz Sahin et al[1] stated that the purpose of the study is to evaluate how pressure on the P6 acupoint affects the prevention of PONV and the need of antiemetic drugs in women who have undergone laparoscopic cholecystectomy.[1] The research question is not clearly defined within the study and the authors have followed the linear study design aimed to provide an open-ended answer to their clearly stated objective.[1]

The theoretical framework is not defined in this article because Sahin et al. are not proposing a theory to explain why the problem exists and why there is a need for the study conducted. Instead, the authors stated the problem itself and the reason the study is being conducted The methods utilized are appropriate for the study. The authors enrolled 111 women who were scheduled for a laparoscopic cholecystectomy for this study from March 2015 to March 2016.[1] A wristband with a cap to be placed on the P6 acupoint illustrated the intervention implemented and the treatment administered. The study was conducted at general surgery department of an education and training facility. They randomized the enrollees in three group of 37 participants each admitted the day before surgery to give them time to collect any information needed and adequately prepare for the procedure.[1]

Inclusion criteria were females aged 18-70, undergoing elective laparoscopic cholecystectomy, had an American Society of Anesthesiologists score of1 to 2 and admitted a day prior to surgery.[1] Exclusion criteria were patients who had emergency for acute cholecystitis, were admitted the day of the surgery, did not volunteer to participate in the study, had loss of upper extremities, had scars, infections and wounds that would prevent the application of the acupressure wristband. Data collection instrument utilized was a form prepared by the interviewer to conduct a face-to-face interview.[1] The data collected were age and body mass index (BMI) of the participants, their smoking status, history of nausea and vomiting history of migraine, severity of nausea and vomiting using a numerical scale. The researchers also recorded the times the acupressure wristband was placed and removed on the patient's wrist and the time anesthesia was administered.

Reliability and validity are not accounted for in this study.[1] The analytical approach has proven consistent with the research design laid out by the authors. Sahin et al. analyzed the data collected and each reported outcomes of the three blind group study.[1] The analysis performed took into consideration any correlation between the accuracy of the acupressure treatment and patient reported outcome in how the wristband affected their PONV and prevented the need for antiemetic drugs. The results were clearly illustrated, and statistics impeccably explained in a narrative forma and with the flow diagram in fig 1, and tables 1 and 2.[1] The authors discussed that the results, although showing that the acupressure treatment utilized did not prevent PONV and need for antiemetic drugs in the participants, elaborated on the inconclusiveness of these results in the discussion.

Morehead A, Salmon G. Efficacy of Acupuncture/Acupressure in the Prevention and Treatment of Nausea and Vomiting Across Multiple Patient Populations

Nausea and vomiting are intricate signs of several different medical conditions. Acupuncture and acupuncture are among the many alternative therapies that patients are resorting to as a result of the negative consequences of various pharmaceutical interventions. Their effectiveness has been demonstrated in patients undergoing chemotherapy, postoperative patients, pediatric patients, and female patients experiencing pregnancy-related nausea and vomiting.[16] When acupuncture and acupressure are used to treat nausea and vomiting, there are little to no adverse effects. It is advisable to encourage healthcare providers to talk with patients who experience nausea and vomiting

about the effectiveness, advantages, and potential adverse effects of acupuncture and acupressure.[10]

The discussion explained the limitations causing the inconclusiveness of the study design. The authors only chose female patients and could not apply the results to the general adult population. The treatment method utilized also had the patient manage their wristband after training; thus, it cannot accurately reveal that the patients placed the wristbands correctly the entire time of data collection. The authors concluded that further research is necessary to determine the effectiveness of acupoint wristbands in preventing PONV and the need for antiemetic medications.

Cooke M, Rapchuk I, Doi SA, et al. Wrist acupressure for post-operative nausea and vomiting

One of the unfavorable consequences of anesthesia and surgery is postoperative nausea and vomiting. Acupuncture is hypothesized to prevent nausea and vomiting by influencing serotonin and endorphin levels. The author tested pre-defined feasibility outcomes and provided preliminary evidence for the effectiveness of PC 6 acupoint stimulation vs. placebo for reducing postoperative nausea and vomiting in cardiac surgery patients in this two-group, parallel, superiority, randomized control pilot experiment[4]. Eighty patients were randomly divided into two groups: those who received PC 6 acupoint stimulation via beaded intervention wristbands (n = 38) and those who received a placebo sham wristband (n = 42). With secondary objectives for nausea, vomiting, rescue anti-emetic medication, quality of recovery, and adverse events, the primary outcome was evaluating pre-established feasibility criteria. The results imply that a large-

scale placebo-controlled randomized controlled trial to investigate the efficacy of PC 6 stimulation on PONV in the post-cardiac surgery population is feasible and justifiable.

Participants reported good tolerability of the intervention, and if wrist acupressure at the PC 6 acupoint proves beneficial in a large-scale trial, this is a straightforward, non-invasive intervention that may be readily used in clinical settings.

Hsiung WT, Chang YC, Yeh ML, Chang YH. Acupressure improves the postoperative comfort of gastric cancer patients

This pilot study studied the potential impact of acupressure on gastric cancer patients' postoperative comfort after a subtotal gastrectomy. There was a randomized controlled study[6]. Thirty patients were chosen from a 3000-bed medical center in Northern Taiwan's 141-bed general surgery unit. Participants were randomized to receive extra acupressure at the acupoints of Zusanli (ST36) and Neiquan (P6) for three days straight or to a control group that received standard postoperative care. At baseline, postoperative pain and postoperative nausea and vomiting (PONV) were similar in both groups. Significant changes were observed in postoperative pain (P=.03) and the first flatus time (P=.04) after acupressure, but not in PONV (P=.49) or the first defecation time (P=.34).

Patients undergoing surgery for stomach cancer can experience increased comfort with acupressure, a straightforward, noninvasive, safe, and affordable therapy. Pain relief and a reduction in the duration until the onset of flatus are two ways acupressure at the P6 and ST36 acupoints might enhance postoperative comfort. Nevertheless, more investigation is required to clarify how acupressure can improve surgical results.

Ünülü M, Kaya N. The effect of Neiguan Point (P6) acupressure with wristband on postoperative nausea, vomiting, and comfort level

According to the Johns Hopkins Tool, this article is a level I randomized controlled experimental trial (RCT) because the researchers did not synthesize the results of other literature and instead, performed their own experimental process to yield confirmation of denial of their study design. The study used the experimental study process of randomization (to randomly assign patients or participants to each blind study group), control (by using one placebo group that received an invalid treatment) and manipulation (by giving the group of randomized patients the adequate acupressure treatment).[2] The authors utilized a mixed method data collection by using data collection tools such as patient demographic, consent forms, anxiety intake form, previous anesthesia and incidences of previous PONV, and comfort level during anesthesia.

The title of this article accurately describes by stating the objective of the study, which is to find the effect of acupressure at the P6 acupoint on PONV and general comfort level.[2] The title also states the type of study the researchers conducted which is a randomized controlled trial. The abstract is representing the article appropriately in that it provides a summary of each section such as the purpose, study design, method, findings, and conclusion. The introduction states the problem which is the high rate of PONV and the distress it causes patients.[2] The introduction also states that PONV brings on a need for antiemetic drugs which cause adverse side effects detrimental to postoperative patients. These two statements explain the reason why the research is being conducted, which is to find more adequate holistic treatment and prevention of PONV and reduce the need for antiemetic drugs.[2] The purpose of the study as reported in the introduction is to

determine how acupressure treatment with a wristband on the P6 acupoint affects PONV in postoperative patients.

The research statement is well-defined in the title and the purpose of the article. Unulu et al. provided the theoretical framework by providing the theories that the research will be testing: Firstly, acupressure on acupoint P6 is as effective to combat PONV; secondly, acupressure on acupoint P6 will enhance postoperative patient comfort.[2] The authors did not include literature review in this article. The study design is a randomized controlled experimental trial where the author performed an experiment to test the indicated hypotheses. The patients were randomized into two groups (intervention and control); the sample size was 97 patients with 50 patients receiving the acupressure treatment and 47 patient being part of the control group who received an antiemetic drug.[2] Data collection occurred in a six month-period utilizing a patient demographic form, a state and trait anxiety level form developed by Spielberg et al, a nausea and vomiting follow up document, an anesthesia questionnaire, a procedure form and a general comfort form

The data analysis was performed with an IBM statistics software and Shapiro-Wilks testing design.[2] The statistical analysis approach described the continuous and categorical variables, and the comparison was made between the variables of the two randomized groups using Mann Whitney U test and Wilcoxon ranked test was used to analyze the dependent variables of each group. The authors reported a level of significance of .001, .01 and .05. The results are presented in the text in narrative forma and with five tables describing the results of the analysis made during the study.[2] Unul et

al found that P6 acupoint acupressure treatment successfully prevents or treats vomiting, and has an even greater effect on nausea, and enhances patient comfort level.

The authors discuss the significance of the results of this study and its potential for nurses due to nurses' ability to use a nonpharmacological method in the prevention and treatment of PONV.[2] Furthermore, this treatment decreased the need for antiemetic drugs and their adverse side effects in postoperative patients. The authors did not perform a blind study and the participants knew if they were getting the acupressure treatment or the antiemetic drug.[2] Another limitation is the study was performed in female patients undergoing gynecologic surgeries and the results cannot be generalized to male patients.

The authors recommended that this study be conducted on different study samples to test the effectiveness of the treatment on male patients. Acupressure knowledge should also be evaluated on Peri anesthesia nurses, and nurses should be educated about this nonpharmacological treatment for PONV when needed.[2]

Sun R, Dai W, Liu Y, et al. non-needle acupoint stimulation for prevention of nausea and vomiting after breast surgery

A significant worldwide health issue that affects women is breast cancer. For patients with breast illness, surgery is the primary form of treatment. The nausea and vomiting following surgery continue to be unsettling. Postoperative nausea and vomiting have been reduced with the help of acupoint stimulation, a successful treatment in traditional Chinese medicine[8]. Non-needle acupoint stimulation has emerged as a novel intervention in recent times. Despite numerous clinical trials, the effectiveness has not yet been determined with certainty. This meta-analysis aims to assess the efficacy of non-needle acupoint stimulation in preventing post-breast surgery nausea and vomiting. They

looked for studies by doing systematic searches in the PubMed, Embase, Cochrane, and Wanfang Med Online databases. The review period ran from the databases' creation to December 31, 2017.

The relevant outcome measures included a significant worldwide health issue that affects women's breast cancer. For patients with breast illness, surgery is the primary form of treatment. The nausea and vomiting following surgery continue to be unsettling.

Two independent reviewers used the Cochrane Collaboration Review Manager software (RevMan 5.3.5) to extract data and evaluate risks of bias. The inclusion criteria were satisfied by 14 randomized controlled trials involving 1009 female participants in the non-needle acupoint stimulation and control groups. While there was no apparent therapeutic effect on vomiting during the first two hours after surgery, non-needle acupoint stimulation was nevertheless very effective in lowering nausea and vomiting over the first 48 hours after surgery. The pooled analysis results in this study have moderate quality evidence based on the Jadad scale. Furthermore, using a wristband acupressure to stimulate an acupoint increased the likelihood of adverse responses, verbal rating scale for nausea, frequency of vomiting, frequency of nausea, and frequency of PONV.

Female patients undergoing breast surgery may benefit from non-needle acupoint stimulation to lessen postoperative nausea and vomiting. Taking this into account, we advise applying transcutaneous acupoint electrical stimulation on PC6 30 minutes before the onset of anesthesia and continuing through the conclusion of the procedure. This non-pharmaceutical strategy could help people recover more quickly from breast surgery.

Noll E, Shodhan S, Romeiser JL, et al. Efficacy of acupressure on quality of recovery after surgery

Based on the Johns Hopkins Tool Kit, this article is a level I Randomized Controlled Trial that uses the three experimental study methods: randomization to randomly assign patients to each group, control by using one placebo group and manipulation by giving the group of randomized patients the acupressure treatment. The authors used an experimental three group (control, intervention and non-intervention), single center and blind pragmatic trial method using high quality evidence and research to yield consistent, definitive results.[3] The experimental research used a mixed method data collection (qualitative and quantitative) in that the authors recorded the qualitative nature of acupressure on alleviating PONV as well as the quantified numerical value of patients reporting positive, negative or neutral symptoms in their experimental three group blind study.[3]

Noll et al. conducted a randomized controlled pragmatic experimental study to find out the effect of acupressure on PONV and postoperative patient reported recovery to accurately represent the title chosen.[3] The introduction clearly introduces and states the problem and the purpose of the article, which is to study the efficiency of acupressure on postoperative recovery factors such as PONV. Noll et al. did not specify research questions and theoretical framework in this study.[3] They focused their experimental design on finding out the purpose of the study and detailing the study methods and thus, could bypass asking targeted research questions and showing a theoretical framework.

Methods: The authors conducted this study using an experimental blind three group design.[3] They enrolled 200 English speaking patients at the Stony Brooks .

Medicine Hospital from March 28, 2016, to October 3, 2017. The inclusion criteria were the patients had to stay in the hospital at least 2 days and provide informed consent. They excluded patients younger than 18 years old and patients that could not have the acupressure points in their wrists and hands.[3] Noll et al- also excluded patients with neuropathy that had lost sensation where the acupoints were performed, and any patients with altered mental status that could not provide informed consent and provide adequate recovery report. The authors accounted for validity by registering their study and getting approval from the Stony Brook University Board Review and publishing their methods in the Trials Journal.[3]

The analytical approach was carried out using the SAS 9.4 software to analyze the homogeneity variance and the differences between the three groups studied. The analysis of variance (ANOVA) assessed the differences between the intervention, placebo and no intervention groups.[3] Multiple linear regression was implemented as a control method for any unaccounted or overlooked factor throughout the randomization process. The analysis proved consistent with the research design laid out by the authors. The results are explained clearly in the article and the authors illustrated 3 tables for further details.[3]

The results contain that over 200 patients gave informed consent to participate in the study. 37 patients were not randomized, 1 patient dropped out of the study right after they were randomized, and another patient dropped out after 1 treatment. 161 patients were randomized, completed the study and the follow up interviews as well as provided the self-reports.[3] The patients had a variety of surgical procedures ranging from laparoscopic to orthopedic with a median procedure duration of 2 hours. In the 54

patients who received the acupressure treatments, over half reported less incidence of PONV and other benefits such as sleeping better.[3]

The discussion section clarifies that the study finds that patients who underwent the acupressure treatment reported a significant decline in PONV and reported higher satisfaction in their postoperative recovery experience due to better sleep, and less pain.

The authors discussed the limitations where the research is presented as a single center study and may not be generalized to other facilities.[3] Second the acupuncturists, although supervised while administering treatment may not have been consistent in their method and the treatment method may not be standardized if it was not consistent.[3] A third limitation present in the patients who may have biases in their self-reported results, especially patients who were part of the placebo group. In conclusion, patients enrolled in the study who received two days of acupressure treatment postoperatively reported increased patient satisfaction in their postoperative symptoms such as PONV.[3]

Eligibility criteria

Postoperative nausea and vomiting (PONV) affects over 80% of all high-risk patients and over 30% of all postoperative patients..[4,5,6] The significance of the scope of this problem is found in the sequalae of its symptoms, with the potential to cause mortality and morbidities.[7] The recovery of postoperative patients who experience this condition can be significantly delayed by complications such as elevated heart rate, increased blood pressure, central venous pressure and intrathoracic pressure.[7,8] The current prevention and treatment method for PONV is typically with the aid of pharmaceuticals such as ondansetron which is a 5-hydroxytryptamine (5-HT_3) antagonist.[4] 5-HT_3 as a serotonin receptor, regulates gastrointestinal (GI) motility and

relays other information needed for the proper function of the GI tract.[4] Currently, the management of PONV with antiemetics that are administered both postoperatively and prophylactically when indicated has their own side effects that are debilitating to the postoperative patient. These side effects can be unwanted sedation and fatigue, headache and constipation and increased drowsiness.[5] Furthermore, these pharmaceuticals can have a short half-life with their therapeutic effects wearing off rapidly which can be costly for patients with long term PONV.[5,6] Studies yielded in this search talked about the risk factors of this problem and found that there are three specific types of factors that influences it. These factors are patient, surgical and anesthesia in nature.[5] Patient factors identifying women who are post pubescent are considered the demographic factor that is the strongest factor in anticipating incidences of PONV. Other patient factors are individuals with motion sickness history.[4,5] In addition, individuals who were characterized as non-smokers are more disposed to PONV than smokers because of the latter's chemoreceptor trigger zone (CTZ) that has been desensitized by the nicotine effects.[5,6] CTZ is explained as being one of the pathways participating in the pathogenesis of understanding the stimulation of emesis, therefore when it has been desensitized, it no longer stimulates nausea and vomiting as in the case of smokers.[4,5,6] Other patient factors include obese individuals and patients who suffer from diabetes and hypothyroidism.[5,6]

Surgical factors that affect incidences of PONV are duration of surgical procedures such as longer procedures, and the types of surgeries such as laparoscopic surgeries has a higher PONV incidences.[4,5] Anesthesia factors dictates that patients undergoing general anesthesia are at more risk of compared to patients who had regional anesthesia. Final

notable risk factors are the use of opioids to manage postoperative pain, history of PONV and migraines.[5]

Patients who suffer the debilitating effects of PONV are at a higher risk of morbidities postoperatively, coupled with the delayed recovery time and added discomfort. [6,7] These effects are caused by symptoms such as dehydration and fluid and electrolyte imbalance. Other PONV related symptoms that cause serious side effects are pulmonary aspiration, wound dehiscence that contribute to delayed recovery from the hospital.[5,6] When patients go on with PONV that is left untreated and not managed properly, they are put at high risk for the conditions discussed above which worsens the already difficult postoperative period.[3,4,5,6] Patients who suffer from postoperative nausea and vomiting report increased suffering from additional symptoms that hinder their recovery process, and dissatisfaction from the multitude of postoperative complications related to PONV.[4,15] A lack of effective solution to this incapacitating clinical problem leads to patients to continue to pay the high price of prolonged admissions and readmissions that this issue causes.[1,2,3,4] In addition, research studies show that when patients anticipate incidences of postoperative nausea and vomiting, they report an increase in their anxiety level and elevated high blood pressure and other postsurgical problems.[4,12] Pharmacological selections including the current PONV management agent ondansetron have not proven efficacious in the successful management of PONV for the majority of postoperative patients.[5,6,7] Due to this lack of clarity, medical providers must look at different therapy options that include proven complementary therapies such as acupressure.[3,4,13]

The current management of PONV indicates dealing with the added symptoms brought on by this clinical issue. Patients who are at high risk for dehydration and its sequalae needs fluid and electrolyte balance, manage oxygenation, continuous monitoring of blood pressure and administering antiemetics to prevent incidences of nausea and vomiting.[8,9,16] There is still a knowledge gap on the exact cause of PONV, only of the possible factors that increase the likelihood of PONV and that this condition is related to anesthetics.[6,7,14] The American Society of Anesthesiologists report on current guidelines with the goal of increasing PONV prevention such as identifying individuals who are at high risk for this condition early on in the perioperative process. These guidelines also seek to reduce these risk factors by utilizing an enhanced recovery pathway that will use multimodal therapy methods.[9] Studies have been conducted to fill this gap on effective treatment methods that yield successful data on efficient prevention and treatment methods of PONV. The studies conducted on acupressure, although have proven promising rates of success as an alternative method, are in their beginning stages and have not filled the knowledge gap that plagues the etiology and effective treatment of PONV.

Research that looked into the implementation of new clinical guidelines to give birth to successful evidence-based practice shows the efficacy of acupressure in managing PONV.[10.20] This complementary therapy option can help high risk PONV patients in reducing incidences of debilitating anesthesia side effects and complications related to PONV.[9,10] Cleveland Clinic's Anesthesiology Institute's physician, Dr. Sabry Ayab, is one of the authors of a newly proposed guidelines to help patients who may experience postoperative nausea and/or postoperative vomiting. This provider

recommends a personalized hands-on approach with patients that starts with the first preoperative visit.[8,9,11] Patients 'history documentation should be thorough and any previous PONV history with be flagged and used to create a preventive multimodal therapy with options involving pharmaceuticals as prophylaxis and treatment, and complementary therapies such as acupressure. His goal in proposing these guidelines is to throw every option available at the patient to prevent PONV.[8,9,16]

The International Anesthesia Research Society proposes an algorithm that focuses on prevention and treatment methods for PONV. These new guidelines present directives that seek to reduce the patient's baseline risk factors for PONV, assess the efficacy of antiemetics administered for PONV every 6 hours postoperatively and utilize alternative therapies such as acupressure to avoid any sequalae.[10,17]

Search Strategy:

This research paper utilized an extensive and thorough search strategy to yield the needed research articles. The author sought to find primary research study articles such as randomized control trials and meta-analysis. Other acceptable research articles needed are systematic review and literature review articles. The author conducted the search by utilizing the Florida International University (FIU) search engine and specific key words to get the proper research articles. The FIU search resulted in articles found on peer reviewed databases such as Medline and CINHAL and PubMed. These resulting articles emphasized the researchers 'experimental design in finding how acupressure affected PONV and its efficacy in preventing and treating this condition. The references included important search parameters such as databases searched discussed above, search terms

and search limitations. The publication date were articles dated within 10 years with full text availability and free full text and abstract available.

The article attribute was associated data. An advanced search performed provided the opportunity to specify on the references appropriated for this research paper. This advanced search also gave the opportunity to input key terms that aided in the input of key terms such as PONV, laparoscopic surgery, efficacy of acupressure, postoperative PONV in women having laparoscopic surgery, postoperative ondansetron, etc. utilizing key terms that explained the problem researched allowed the author to execute a successful search that yielded 10 satisfactory articles appraised in the literature review matrix discussed further in this paper.

The literature review that follows this search strategy addressed the articles found. The exact key terms and phrases used were "postoperative nausea and vomiting (PONV)" and "laparoscopic surgery" and "acupressure to treat PONV" and "acupressure versus ondansetron to treat PONV".

Keywords:

Acupressure, Postoperative nausea and vomiting, women undergoing laparoscopic procedure, alternative to Zofran, Neiguan point.

Definition of Terms:

Postoperative nausea and vomiting (PONV): nausea and vomiting or retching that usually occurs within the first 24 hours of surgery in the PACU or at home.

PACU: post-anesthesia care unit.

Acupressure: Alternative medicine where pressure is exercised on different acupuncture points to release energy and restore health and balance.

$5\text{-}HT_3$: a serotonin receptor that regulates motility and relays information in the gastrointestinal tract.

Primary DNP Project Goal:

Anesthesiology providers concur on the debilitating effects and seriousness of postoperative nausea and vomiting.[1] PONV is described as vomiting, retching, and nausea within the first 24 hours of surgery in the post-anesthesia care unit (PACU) or at home.[2] The American Association of Nurse Anesthesiology (AANA) reports PONV as a debilitating condition consuming healthcare resources and costs.[3] In fact, the AANA insists on early identification of high-risk PONV patients through the evidence-based PONV determining instrument called the Apfel Simplified Score.[1,3,18] This scoring system provides a proven method to identify patients at high risk for this condition so that anesthesiology providers can establish a care plan, including prophylactic treatment methods to prevent this condition.[1,3,11]

The primary goal of this DNP project is to synthesize peer-reviewed journals and to find out the efficacy of acupressure in treating PONV versus ondansetron. As a level I trauma center and one of the top 10 most significant public health systems in the United States, has been carefully selected as my immersion and clinical site. Its surgery department is unrivaled, and my observation yielded that the current protocol for PONV patients is early identification of high-risk patients and a combination of antiemetics as prophylaxis and treatment options for severe PONV patients. There is a gap between the current state of management options for this condition and the goal established in this project. The gap refers mainly to a lack of knowledge of the therapeutic effects of

acupressure, thus, a lack of research that can lead to evidence-based clinical guidelines to treat PONV.

The need for another methodology of proficient guidelines for PONV arose for this project because of the adverse effects and high cost of this 5-hydroxytryptamine (5-$HT_{3)}$ antagonist antiemetic.[3,14,16] As the current literature shows, the prevalent management of patients experiencing postoperative nausea or postoperative vomiting or the combination of both is the rescue antiemetic ondansetron.[1,2,3,4] The downside of ondansetron is its adverse effects, such as xerostomia, hypotension, and extrapyramidal symptoms, such as dystonic reactions, restlessness, and drowsiness. In addition, ondansetron is a recurring treatment option, having a shorter half-life and therapeutic effect.[4] This highlights the high costs for patients combined with extended hospital stay and overall patient discomfort and dissatisfaction in the perioperative process.[4]

Description of the Program Structure:

This project, conducted through Florida International University's DNP program guidelines, invited the student registered nurse anesthetist the needed mentorship to independently conduct an analytical research project that highlights problems that are specific within the current anesthesia practice and approved by the faculty. A strength, weaknesses, opportunities, and threats (SWOT) analysis will be done to complete this section of the project. SWOT analysis is a management and planning technique utilized as a framework when planning a project.[6]

The stakeholders or individuals who have a vested interest in this project, such as anesthesia providers, patients, hospitals, etc., have distinctive roles and responsibilities.[5,6] The quality improvement project demands that each stakeholder actively participates,

whether it is through the research, educational presentation, and other needed tasks of the proven goals done by the anesthesia providers or the hospital itself facilitating further conclusive research by supplying the needed technology, training, and resources to establish policies and clinical guidelines to serve patients suffering from PONV.[5,6]

Strengths

One strength of this project is based on the need for more efficacious prevention and treatment options for PONV. The seriousness of PONV provides an undisputable reason to seek and conduct research that will prove that other treatment plans can be more effective than its current clinical management.[1,2,3,4] In addition, the use of pharmaceuticals established as the prevalent treatment option can cause other debilitating side effects that will further hinder the patient's ability to recover safely from surgery.[1,2,3,4] The literature proving the efficacy of acupressure as an alternative treatment for this condition, although in its early stage, is deemed promising enough to warrant the conduction of this project.

Weaknesses

The analysis of weaknesses in a quality improvement project is an opportunity for improvement.[6,13] The weakness noted in the execution of this project is its need to go against a prevalent established protocol utilized by most major health systems in the United States. Significant work has to be done in the form of quantitative and qualitative research and lobbying anesthesia experts as well as other vested stakeholders to accomplish the goal highlighted in this project. Another weakness is the early stage of the literature that proves the efficacy of acupressure as a viable treatment option for PONV.

Opportunities

As stated earlier, the identification of weakness also provides opportunities to ameliorate this research project.[6,20] Medicine is ever improving and changing, especially when there is an active problem that needs solving. The inclusion of acupressure is an opportunity anesthesia providers can give their patients to have a treatment method devoid of other incapacitating adverse effects.[3,11] The vesting of stakeholders provides a vital opportunity to accomplish the goals set for this project and have the needed resources, technology, and personnel that participate in its completion. There is an overall significant opportunity to participate in establishing clinical guidelines and policies that dictate a more effective treatment option for the identified problem of PONV.

Threats

The threats that this project faces also relate to the weaknesses mentioned above. Identifying threats in a quality improvement project pertains to the obstacles it faces that can hinder the accomplishment of its goals and outcomes.[6] A notable threat to this project is the inability of stakeholders to consider the need for this project. Stakeholder participation, along with the needed staff, resources are needed for its accomplishment. Other threats can be studies that disprove the efficiency of acupressure and thus debunk the premise of this project.

Methodology of Quality Improvement

Setting:

This project facilitated by Florida International University's DNP program guidelines will be conducted at a level 1 trauma center and one of the top 10 most significant public health systems in the United States. The setting is Broward Health Medical Center in Fort Lauderdale, a 716-bed hospital that has all of the medical specialties. The staff of over 3100 medical professionals including CRNAs and anesthesiologists.

Description and Participants:

This study proving the efficacy of acupressure will be conducted through comprehensive literature review using Medline (ProQuest), Excerpta Medica Database (EMBASE), and Cumulative Index of Nursing and Allied Health Literature (CINAHL). This review will be conducted using a combination of search words and Boolean operators to find literature reporting the research on acupressure as a valid treatment to treat PONV in women having laparoscopic surgery. The setting for this project is through Florida International University's DNP program guidelines and conducted at a level 1 trauma center and one of the top 10 most significant public health systems in the United States. The participants of this project involve interested parties such CRNAs, anesthesiologists and anesthesiology residents. Each stakeholder will actively participate, either through this review, educational presentation, and other needed tasks.[5,6,12]

Protection of Human Subjects:

The protection of human subjects remains a priority in the accomplishment of this quality improvement project. The subjects will be recruited via voluntary participation involving an informative recruitment process such as emails. Each participant will be made to signa a consent form and made aware of their rights as well personal information

confidentiality throughout the duration of the project. Each participant is entitled to information and safety as well as reserve the right to withdraw from the project.

Data Collection/Management:

All data to be collected will include a pre-test/pro-test format as well as outcome measures. Primary data such as participant demographic will be collected on specific data forms using data collection tools such as questionnaires, surveys, researcher observation etc. The reliability and validity of any instrument for data evaluation will be evaluated by the primary investigator. All data will be kept as designated by the DNP student in a secured file on a secure portable electronic device accessible only to the researcher. Furthermore, the research also ensures confidentiality with data entry and any needed statistical data analysis done for the purpose of the project. All relevant data will be analyzed utilizing statistical analysis and the results will be double checked for reliability and validity.

Analysis and Measurement:

The participants were first sent the pre-test questionnaire through the given access to their emails along with a PDF and a link containing informational materials covering every aspect of the subject needed to successfully answer the questions. A total of 3 weeks was allotted to learn the material and answer questions. Then the answers collected from the Qualtrics software were input into an excel sheet in order to perform the comparisons and statistical differences showing the degree of learning between pre-test and post-tests answers.

Results of Quality Improvement

Demographics

The total of 10 participants answered the 10 questions in both the pre-test and post-test questionnaire (n=10, 100%), yielding an attrition rate of 0 due to no change in this aspect. 5 participants had doctorate degrees (n=5, 50%) including the medical doctor and 5 CRNAs had master's degrees (n=5, 50%). The participants were between the ages of 25-44, with 5 participants between in the group age of 25-34 (n=5, 50%) and the other 5 participants in the age group of 35-44 (n=5, 50%). The gender differences were 7 female (n=7, 70%) and 3 males (n=3, 30%). The race and ethnicities of the participants were Caucasian (n=3, 30%), African American (n=4, 40%), and Hispanic (n=2, 20%), and 1 participant who identified as other (n=1, 10%). One participant was a medical doctor (n-1, 10%), and 9 were CRNAs (n=9, 90%). The participants' years of experience as anesthesia providers varied, with 5 participants with less than 1 year as a practitioner (n=5, 50%), 4 participants with 1-5 years' experience (n=4, 40%) and 1 participant with 6-10 years of experience (n=1, 10%). The demographics described is illustrated in the table below:

Demographics	N (%)
Total Participants	10 (100%)
Education	
Doctorate Degree	5 (50%)
Masters	5 (50%)
Other	
Age	5 (50%)
25-34	5 (50%)
35-44	0 (o%)
45-54	0 (0%)
55-64	0 (0%)
65 and older	0 (0%)
Gender	

Female	7 (70%)
Male	3 (30%)
Nonbinary /third Gender	0 (0%)
Prefer not to say	0 (0%)
Ethnicity	
Caucasian	3 (30%)
African American	4 (40%)
Asian	0 (0%)
Hispanic	2 (20%)
Native American	0 (0%)
Other	1 (10%)
Title	
MD	1 (10%)
CRNA	9 (90%)
Years	
< 1 year	5 (50%)
1-5	4 (40%)
6-10	1 (10%)
>10	0 (0%)

Pre-Test Answers:

A total of 10 anesthesia providers answered the pre-test questions aimed at establishing their knowledge of the P6 acupoint as a treatment modality for PONV. The first question asking about the risk factors for PONV was answered correctly by only 10% of the participants. In contrast, a great majority (90%) of the volunteers picked the right answer for the multiple-choice question asking for consequences of untreated PONV. In addition, 80% knew what the adverse reaction of ondansetron used for PONV and answered QT prolongation. The same percentage (80%) knew where the P6 acustimulation was placed and answered correctly with forearm. 80% answered true when asked if P6 acupuncture reduced PONV.

There was a notable shift when asked if P6 acustimulation increased patient satisfaction as only 9% answered true. The multiple-choice question to identify the mechanism of action of P6 acustimulation was answered correctly by 40% of the participants. 60% knew what the effect of TEAS was and 40% knew another name for P6 acupressure point. The answerers collected are shown in the table below.

Post-Test Answers:

All 10 participants completed the post-test questionnaire and sent their answers to be evaluated. These answers showed a mixed results with an overall increase in knowledge about P6 acupressure as a treatment for PONV. There was no difference in their knowledge of risk factors for PONV as only 10% answered correctly and said age. There was a decrease in the participants' knowledge about the consequences of untreated PONV as 78% answered correctly in the post-test compared to 90% in the pre-test, which accounts for a 12% difference. There was a 10% increase in correct answers about the adverse effect of Ondansetron with 90% answering QT prolongation.

There was no difference in the percentage that answered forearm for the placement of the P6 acustimulation. 100% of the volunteers answered true about P6 acupressure reducing PON, accounting for a 20% increase from the pre-test. A remarkable 81% increase in the correct answers when asked if acupressure increases patient satisfaction with 90% now answering true. Another marked increase was for the incorrect mechanism of action question where now 78% of the volunteers answered correctly compared to 40% in the pre-test. A slight increase of 7% was noted about the effect of TEAS with 67% of participants now answering correctly. Finally, there was a

38% improvement in the number of correct answers for another name for P6 acupressure point. The Table depicts these results as discussed.

Correct responses	Pre-Test	Post -Test	Difference
What is the highest Risk factor for PONV- Age	10%	10%	0%
Untreated PONV can lead to- All the above	90%	78%	-12%
What is an adverse reaction of ondansetron- QT prolongation	80%	90%	10%
P6 acustimulation is placed on what region of the body- Forearm	80%	80%	0%
Does P6 acustimulation reduces PONV-True	80%	100%	20%
Does P6 acustimulation increases patient satisfaction - True	9%	90%	81%
Which of the following is incorrect about the mechanism of action of P6 acustimulation to decrease PONV?-	40%	78%	38%
What is an effect of Transcutaneous Electrical Acupoint stimulation (TEAS)?	60%	67%	7%
What is another name for P6 acupressure Point?	40%	78%	38%

Prospects for Practice:

The final answers evaluated from both the pre-test and post-test evaluated the likelihood of the participants adopting P6 acupressure as a treatment modality in the prevention and treatment of PONV in the event it became available at their facility. While these results presented a mixed attitude about this question again, there was an overall positive trend toward anesthesia providers choosing this option when possible. A

48% increase was noted in the number of volunteers who answered they were extremely likely to use it compared to only 30% in the pre-test questionnaire. A decrease of 8% of participants answered they were somewhat likely to use this treatment for PONV compared to 30% in the pre-test. There was also a decrease of 30% in individuals who answered they were neither likely nor unlikely to use P6 acupressure for their patients.

There was a decrease of 10% in people volunteers answered they were somewhat likely to make use of this option compared to 10% at first. Finally, there was no difference in individuals who stated they were extremely unlikely to use this treatment in that both pre-test and post-test answers were 0%. This table shows these results as discussed.

Discussion of Quality Improvement

Implications for Future Practice

Goals and Outcomes (SMART):

This section of the project will highlight the goals and outcomes aimed by the author using the SMART acronym that directs goals to be specific, measurable, attainable or achievable, relevant or realistic, and time bound.[5] This acronym ensures that the goals stated in a project or clinical trial can be attained following the completion of the research conducted.[5]

Specific

The author aims to develop a research paper to assess acupressure's efficacy or therapeutic effects in preventing and decreasing incidences of PONV in laparoscopic patients.

Measurable

The research proving the efficacy of acupressure will be conducted through comprehensive literature using Medline (ProQuest), Excerpta Medica Database (EMBASE), and Cumulative Index of Nursing and Allied Health Literature (CINAHL). This research will be conducted using a combination of search words and Boolean operators to find literature reporting the research on acupressure as a valid treatment to treat PONV in women having laparoscopic surgery.

Achievable

The author will refer to the guidance and opinions of anesthesia experts by consulting anesthesiologists, certified registered nurse anesthetists (CRNAs), surgeons, physicians, and nurses in the clinical practice and formulate an action plan to educate anesthesia providers on the potential benefit of using minimally invasive acupressure such as wrist band to reduce PONV in women having a laparoscopic procedure.

Time Bound

By the end of the semester, the author will assess what is already established regarding acupressure as treatment in surgery and have a proposed project that can move further to conclude the DNP research requirements to advance the establishment of clinical policies and protocols for the placement of acupressure wrist bands before surgery.

Limitations:

This survey had several limitations despite the overall positive results it yielded. One limitation was the number of people who participated in the survey compared to the number of individuals asked. In addition, the method of recruitment was lacking in that only one email was sent to invite participants and collect data. The reason for the low number of volunteers could be explained by a variety of factors such as no interest in participating, already heavy workload, email not going to the right mailbox, etc. Improvements can be made by allowing the SRNA to deploy multiple participant recruitment methods such as flyers and face-to-face interaction and repeated follow-up emails.

Plans for QI Next Steps

PONV can lead to negative patient outcomes such as delayed healing and prolonged hospitalizations in post-surgical patients.[1,2,3,4] The studies evaluated in this paper has shown individuals who are prone to PONV by identifying patient risk factors which enhances the possibility of successful prevention for this condition. In addition, the side effects of ondansetron are also identified as carrying the same consequences as PONV postoperatively.[1] This study discovered a gap between knowledge of P6 acupressure in helping prevent and treat postoperative PONV in patients with high risk factors. There was a lack of prior knowledge about this treatment method identified in subject participants.[1,2,3] Only 10% of volunteers could identify PONV patient risk factors in both the pre-test and post-test and 40% knew the correct mechanism of action of P6 acustimulation in the pre-test. This lack of knowledge is indicative of the need for initiatives to educate practitioners about the benefits of P6 acupressure.[1,2] More inclusive

and wider scale research is necessary to identify the true barriers in implementing this treatment methodology in practice.

Plan for Sustaining the Practice Change

Quality improvement utilizes a needed framework to allow changes to be made in the healthcare delivery process and for improved patient care.[10] There are various factors that need to collaborate and form a cohesive relationship to enable sustainable changes to take place.[9] Organizational change and support call for changes in health policies to provide the fiscal support that would sustain valuable changes for this quality improvement and help patients with PONV.[10] Organizations can do their part by implementing training and seminars so health care professionals can learn about this technique and how to successfully incorporate it into postoperative management.[9,10] Favorable results will allow for this practice to be further researched and be featured as evidence-based practice guidelines in an effort to decrease the severity of this condition.

Discussion of Results:

This quality improvement study was conducted utilizing research demonstrating the significance and efficacy of acupressure in relieving patients of PONV symptoms. The studies highlighted in this project introduced adult participants aged 18 years and older (n>18 years) who have voluntarily consented to being treated with acupressure for this research.[1,2,3,4,5] These studies confirmed the efficacy of acupressure as an alternative or complementary method in treating PONV in high-risk patients. [1,2,3,4,5] Each study provided an experimental and control group. For example, study 1 had an experimental group that received the acupressure treatment (n=47) and a control group that received a placebo treatment (n=50) for a total of 97 participants that were randomized into each

group.[1] This quality improvement project takes into consideration the multitude of studies that draw a parallel between patient satisfaction and patient comfort, thus eliminating postoperative nuisances such as PONV and allowing for adequate recovery

Conclusions:

This research reviewed literature that showed the efficacy of a prevention and treatment method for patients suffering from PONV. It analyzed the current management method ondansetron and its overall therapeutic function in postoperative patients. The proposed solution discussed in this document takes into consideration the need for further studies reviewing the efficacy of acupressure and for clinical practice guidelines that recommend acupressure as a prophylaxis and treatment plan for high-risk surgical patients.[9,10] These proposed guidelines will reinforce the need to establish a proven therapy method that successfully treats and prevents PONV. The added cost and side effects that Antiemetics like ondansetron carries is not the ideal treatment method for patients who already are at high risk for PONV.[10] The need for a non-invasive efficient therapy that all patients can opt for without the fear of side effects and worsening symptoms that delay surgical recovery is present and needs further research.

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Appendix A : Pretest and Posttest questionnaire

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Pretest and Posttest Questionnaire:

The Use of acupressure to decrease PONV in patients undergoing laparoscopic procedure, an evidence-based education Module.

INTRODUCTION

The primary aim of this QI project is to increase providers awareness on the use of acupressure to decrease PONV in women having laparoscopic procedures

Please answer the question below to the best of your ability. The questions are either in multiple choice or true/false format and are meant to measure knowledge on acupressure to decrease PONV

PERSONAL INFORMATION

1. **Gender:** Male Female Other_____
2. **Ages 25 and above:** _____
3. **Ethnicity:** Hispanic Caucasian African American Asian Other_____
4. **Position/Title:** CRNA Anesthesiologist Resident Anesthesiologist Assistant
5. **Level of Education:** Certificate Bachelors Masters DNP PhD
6. How many years have you been a perioperative provider?

   Over 10 5-10 years 2-5 years 1-2 years

QUESTIONNAIRE

1. **The Highest Risk Factor for PONV**
    a. History of motion sickness
    b. Female Gender
    c. Age
    d. Obesity
2. **Untreated PONV can lead:**
    a. Wound dehiscence
    b. Aspiration
    c. Dehydration
    d. Unanticipated hospital admission
    e. All the above
3. **What are the adverse drug reactions of ondansetron**
    a. Abdominal pain
    b. aPTT prolongation
    c. QT prolongation
    d. Hyperglycemia
4. **P6 Acustimulation is placed on what region of the body**
    a. Forearm
    b. leg
    c. Upper abdomen
    d. back
5. **Does P6 acustimulation reduces PONV.** True or False

6. **Does P6 acustimulation increases Patient satisfaction . True or false**
7. **Which of the following is incorrect the mechanism of action of P6 acustimulation to decrease PONV**
    a. **Prevents afferent signals from traveling to the CTZ**
    b. Increases vagal nerve firing which increases gastric peristalsis
    c. Increases endorphin release in the the CSF and alters serotonin transmission
8. **Transcutaneous Electrical Acupoint stimulation (TEAS)**
    a. Not effective
    b. Exacerbates PONV
    c. Painful
    d. Can reduce rescue antiemetics
9. What is another name for P6 acupressure Point?
    a. Neiguan point
    b. Shih tzu point
    c. CTZ point
    d. Acustimulation point
10. **If Available at your facility, how likely are you to use P6 acustimulation as adjunctive therapy to prevent or treat PONV**
    a. **Extremely Likely**
    b. **Somewhat likely**
    c. **Neither unlikely nor likely**
    d. **Somewhat unlikely**
    e. **Very unlikely.**

Appendix B : QI Project consent

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CONSENT TO PARTICIPATE IN A QUALITY IMPROVEMENT PROJECT

The Use of Acupressure to decrease PONV in patient undergoing laparoscopic surgery: an evidence-based educational module.

SUMMARY INFORMATION

Things you should know about this study:

- **Purpose:** Educational module to increase providers awareness of the use of acupressure to decrease PONV in patients undergoing laparoscopic surgeries
- **Procedures**: If the participant chooses to participate, they will be asked to complete a pretest, watch a voice PowerPoint, and then a post test
- **Duration:** This will take about a total of 20 minutes total.
- **Risks**: There will be minimal risks involved with this project, as would be expected in any type of educational intervention, which may include mild emotional stress or mild physical discomfort from sitting on a chair for an extended period.
- **Benefits:** The main benefit to you from this research is increase the participants knowledge on the use of acupressure to decrease PONV in women having laparoscopic surgeries.
- **Alternatives:** There are no known alternatives available to the participant other than not taking part in this quality improvement project.
- **Participation:** Taking part in this quality improvement project is voluntary.

Please carefully read the entire document before agreeing to participate.

NUMBER OF STUDY PARTICIPANTS:

If the participant decides to be in this study, they will be one of approximately 10 people in this research study.

PURPOSE OF THE PROJECT

The participant is being asked to be in a quality improvement project. The goal of this project is to increase providers' knowledge on the use of acupressure to decrease PONV in women having laparoscopic surgeries. If you decide to participate, you will be 1 of approximately 10 participants.

DURATION OF THE PROJECT

The participation will require about 25 minutes

PROCEDURES

If the participant agrees to be in the project, PI will ask you to do the following things:

1. Complete an online 10 question pre-test survey via Qualtrics, an Online survey product for which the URL link is provided
2. Review the educational PowerPoint Module lasting 15 minutes via Qualtrics, an Online survey product

for which the URL link is provided.
3. Complete the online 10 question post-test survey via Qualtrics, an Online survey product for which the URL link is provided.

RISKS AND/OR DISCOMFORTS
The main risk or discomfort from this research is minimal. There will be minimal risks involved with this project, as would be expected in any type of educational intervention, which may include mild emotional stress or mild physical discomfort from sitting on a chair for an extended period.

BENEFITS
The following benefits may be associated with participation in this project: An increased participants knowledge on the use of acupressure to decrease PONV in women having laparoscopic surgeries. The overall objective of the program is to increase the providers' knowledge based on the current literature.

ALTERNATIVES
There are no known alternatives available to the participant other than not taking part in this project. However, if the participant would like to receive the educational material, it will be provided to them at no cost.

CONFIDENTIALITY
The records of this project will be kept private and will be protected to the fullest extent provided by law. If, in any sort of report, PI might publish, it will not include any information that will make it possible to identify the participant. Records will be stored securely, and only the project team will have access to the records.

PARTICIPATION: Taking part in this quality improvement project is voluntary.

COMPENSATION & COSTS
There is no cost or payment to the participant for receiving the health education and/or for participating in this project.

RIGHT TO DECLINE OR WITHDRAW
The participation in this project is voluntary. The participant is free to participate in the project or withdraw the consent at any time during the project. The participant's withdrawal or lack of participation will not affect any benefits to which you are otherwise entitled. The investigator reserves the right to remove the participant without their consent at such time that they feel it is in their best interest.

RESEARCHER CONTACT INFORMATION
If you have any questions about the purpose, procedures, or any other issues relating to this research project, you may contact Frances Noziere at 7865648918/fnozi001@fiu.edu. and Fernando Alfonso /305-348-9894 AND falfonso@fiu.edu.

IRB CONTACT INFORMATION
If the participant would like to talk with someone about their rights pertaining to being a

subject in this project or about ethical issues with this project, the participant may contact the FIU Office of Research Integrity by phone at 305-348-2494 or by email at ori@fiu.edu.

PARTICIPANT AGREEMENT

I have read the information in this consent form and agree to participate in this study. I have had a chance to ask any questions I have about this study, and they have been answered for me. By clicking on the "consent to participate" button below I am providing my informed consent.

Appendix C :IRB Exemption

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MEMORANDUM

To: Dr. Fernando Alfonso

CC: Frances Noziere

From: Carrie Bassols, BA, IRB Coordinator CeB

Date: March 9, 2023

Proposal Title: "The use of acupressure to decrease PONV in patients undergoing laparoscopic procedure, an evidence-based education module."

The Florida International University Office of Research Integrity has reviewed your research study for the use of human subjects and deemed it Exempt via the **Exempt Review** process.

IRB Protocol Exemption #: IRB-23-0112 **IRB Exemption Date:** 03/09/23
TOPAZ Reference #: 112825

As a requirement of IRB Exemption you are required to:

1) Submit an IRB Exempt Amendment Form for all proposed additions or changes in the procedures involving human subjects. All additions and changes must be reviewed and approved prior to implementation.
2) Promptly submit an IRB Exempt Event Report Form for every serious or unusual or unanticipated adverse event, problems with the rights or welfare of the human subjects, and/or deviations from the approved protocol.
1) Submit an IRB Exempt Project Completion Report Form when the study is finished or discontinued.

Special Conditions: N/A

For further information, you may visit the IRB website at http://research.fiu.edu/irb.

Appendix D: Letter of Support

ANESCO
Driving Results in Anesthesia

February 7, 2023

Alfonso Fernando DNP, CRNA, APRN
Clinical Assistant Professor
Department of Nurse Anesthesiology
Florida International University

Dr. Alfonso Fernando,

Thank you for inviting Healthcare Performance Anesco to participate in the Doctor of Nursing Practice (DNP) project conducted by **Frances Noziere** entitled "The use of acupressure in patients undergoing laparoscopic procedure to decrease postop nausea and vomiting: An evidence -based education module." in the Nicole Wertheim College of Nursing and Health Sciences, Department of Nurse Anesthesiology at Florida International University. I have granted the student permission to conduct the project using our providers.

Evidence-based practice's primary aim is to yield the best outcomes for patients by selecting interventions supported by the evidence. This proposed quality improvement project seeks to utilize the latest literature to increase providers awareness about Acupressure to decrease postop nausea and vomiting.

We understand that participation in the study is voluntary and carries no overt risk. All Anesthesiology providers are free to participate or withdraw from the study at any time. The educational intervention will be conveyed by a 15-minute virtual PowerPoint presentation, with a pretest and posttest questionnaire delivered by a URL link electronically via Qualtrics, an online survey product. Responses to pretest and posttest surveys are not linked to any participant. The collected information is reported as an aggregate, and there is no monetary compensation for participation. All collected material will be kept confidential, stored in a password encrypted digital cloud, and only be accessible to the investigators of this study: Frances Noziere and Alfonso Fernando

Once the Institutional Review Board's approval is achieved, this scholarly project's execution will occur over two weeks. Frances Noziere will behave professionally, follow standards of care, and not impede hospital performance. We support the participation of our Anesthesiology providers in this project and look forward to working with you.

2/9/23

Edward Punzalan, DNP, CRNA, APRN
Administrative Director of Nurse Anesthesia
Healthcare Performance Anesco

Date

Appendix E : Recruitment Letter

FIU
Department of Nurse Anesthesiology

Dear Anesco Anesthesia Provider:

I am Frances Noziere, a doctoral candidate from the Florida International University Nurse Anesthesiology Program. I am writing to invite you to participate in my quality improvement project. The goal of this project is to improve healthcare provider knowledge and awareness of the benefits of acupressure to decrease postoperative nausea and vomiting compared to ondansetron in patients undergoing laparoscopic surgery.

If the participant decides to participate in this project, they will be asked to complete a consent form for participation. The participant will then complete a pre-module survey, which is expected to take approximately 5 minutes. The participant will then be asked to watch an approximately 10-minute-long educational presentation online. After watching the video, the participant will then be asked to complete a post-module survey which is expected to take 5 minutes. No compensation will be provided. The risks of completing this survey are minimal. There will be minimal risks involved with this project, as would be expected in any type of educational intervention, which may include mild emotional stress or mild physical discomfort from sitting on a chair for an extended period.

Remember, this is completely voluntary. The participant can choose to be a part of the study or not. Should the participant have any questions about the study, please email or contact me at Fnozi001@fiu.edu or 7865648918.

Thank you very much.

Follow this link to the Survey:
Take the Survey

Or copy and paste the URL below into your internet browser:

https://fiu.yul1.qualtrics.com/jfe/preview/previewId/d28c6cdf-6292-4173-991f-7ec7c37a1ba0/SV_2c5EhqX4QB9OFy6?Q_CHL=preview&Q_SurveyVersionID=current

Kind Regards,

Frances Noziere, BSN, RN,
Florida Association of Nurse Anesthetists Student Representative
Student Registered Nurse Anesthetist 2023 Vice President
Nicole Wertheim College of Nursing and Health Sciences
Florida International University

Appendix F : Summary of literature Tables

Citation	Design /Method	Sample/ Setting	Major Variables Studied	Measurement And Data Analysis	Findings	Results	Conclusion	Appraisal: Worth to Practice /Level
Ünülü M & Kaya N, 2018.	RCT Purpose: effect of wristband acupressure at P6 point application affects PONV Method: mixed method data collection by using data collection tools such as patient demographic, consent forms, anxiety	N= 97 PTs, active group= 47, control group=50 Setting: Obstetrics Hospital Attrition = NR	IV=Wristband P6 acupressure application point DV = nausea, vomiting, comfort level	IBM SPSS 20.0 statistics package software Shapiro-Wilks test for normality assessment Mann-Whitney U test for comparison of 2 independent groups Wilcoxon signed rank test for dependent groups comparison	No significant difference between control and study groups for each test	Acupressure at P6 point is more effective than antiemetics in treating PONV Acupressure at P6 point is more effective in overall patient comfort level	Acupressure at P6 point in post-surgical obstetrics is preferrable to antiemetics	*****Weaknesses: Study was only conducted on female patients Level of knowledge of acupressure should be tested in nurses

	intake form, previous anesthesia and incidence of previous PONV, comfort level during anesthesia							

Citation	Design/ Method	Sample/ Setting	Major Variables Studied	Measurement And Data Analysis	Findings	Results	Conclusion	Appraisal: Worth to Practice/Level
Noll E et al., 2019.	Level 1 RCT Purpose: efficacy of acupressure on PONV and recovery Method: experimental three group (control, intervention and non-intervention), single center and blind pragmatic trial method assessing acupressure on the PC6, LI4	N= 200 PTs, active group= 54, control group=54 Sham active group= 53 Not randomized= 37 Setting: Stony Brook Medicine University Hospital Attrition = NR	IV=Acupressure on PC6, LI4 and HT7 acupoints points DV = nausea, vomiting, recovery	Sample size calculations using SAS 9.4 software (SAS) Quality of Recovery (QoR-15) evaluation to measure	No significant difference found within the 3 sample groups Better QR in the acupressure groups compared to the no intervention group	Acupressure at the PC6, LI4 and HT7 acupoints yielded positive scores in reported post op pain, nausea and vomiting	Acupressure at the PC6, LI4 and HT7 acupoints is efficacious in managing post op pain and PONV	Weaknesses: center study, no acupuncturists, no blind study for patients so reported outcomes may be biased Strengths: 3 interventions groups Assessment team was blinded

	and HT7 acupoints							

Citation	Design/ Method	Sample/ Setting	Major Variables Studied	Measurement And Data Analysis	Findings	Results	Conclusion	Appraisal: Worth to Practice/Level
Hofmann et al., 2017.	RCT Design: A randomized blinded placebo-controlled study design was implemented Method: study enrollment criteria included four of five risk factors as defined in 2006 by America	N= 110 PTs, active group= 57, control group=53 Setting: 321-bed hospital in the Midwest Attrition = NR	IV=Wristb and P6 Neiguan acupressure application point DV = nausea, vomiting, comfort level	Visual Analogue Scale instrument (VAS) to record nausea, vomiting 5< acceptable	Analysis of variance found no significant difference between sham and study groups for each test	Males=0 on VAS Females =0 on VAS	Acupressure at P6 point is effective for high-risk ambulatory PONV PTs	*****Weaknesses: single center study, limited to ambulatory PTs, scale not tested for reliability Recommendations: Test other acupoints Implement PONV risk factors assessment as routine care

	n Society of PeriAnesthesia Nurses PON							

Citation	Design/ Method	Sample/ Setting	Major Variables Studied	Measurement And Data Analysis	Findings	Results	Conclusion	Appraisal: Worth to Practice/Level
Cooke et al., 2015.	RCT level 1 Design: pilot study was a two-group, parallel, superiority, RCT that randomly assigned post-operative adult cardiac surgery patients to PC 6 acupoint stimulation Method: Randomization, Blinding allocation using stimulation via a beaded wrist band or no	N= 200 surgeries, active group= 100 surgeries, control group=100 surgeries Setting: adult post-cardiac population in Brisbane Hospital Attrition = NR	IV=bilateral applications of sea band P6 acupressure wristbands. DV = nausea, vomiting, comfort level	Apfel risk score to assess risk factors and level for PONV Nausea, vomiting and rescue anti emetic therapy Quality of recovery (QoR-15) survey with 15 questions on reported outcomes	No significant difference between control and study groups for each test	94% protocol adherence 24% decrease of PONV CI: 4.25%-37.1% decrease in nausea, vomiting.	Acupressure at P6 point in post-surgical adult cardiac patients is preferrable to antiemetics	*****Weaknesses: single center study, participants reported wristband wrist too tight Strengths: Blinding addressed successfully.

	stimulation using a sham non-beaded wrist band							

Citation	Design/Method	Sample/ Setting	Major Variables Studied	Measurement And Data Analysis	Findings	Results	Conclusion	Appraisal: Worth to Practice/Level
Küçük E & al., 2021,	RCT level 1 Design: A randomized controlled experimental study to determine the effect of acupressure nausea, vomiting, and vital signs in patients undergoing gyn ecologic surgery Method: mixed method data collection where female participants aged 18-69 were randomized into three groups using	N= 111 PTs, active K-K9 group= 39, active P6 group= 37 control group=35 Setting: Obstetrics clinic at an Istanbul Hospital Attrition = NR	IV=Wrist band P6 acupressure application point Wristband K-K9 acupoint DV = nausea, vomiting, comfort level	IBM SPSS 25.0 statistics package software to assess data acquired Shapiro-Wilks test for normality assessment Levine tests for variance homogeneity assessment	No significant difference between control and study groups for each test Homogeneity in age, BMI, income status and educational background for each group	K-K9 nausea scores significantly lower than control group <0.05 K-K9 scores significantly lower than P6 group <0.05	Acupressure at K-K9 point is more effective in treating PONV	*****Weaknesses: only female gender studied, sample size not significant, single center study

	wristbands and seeds for pressure points.							

Citation	Design/Method	Sample/ Setting	Major Variables Studied	Measurement And Data Analysis	Findings	Results	Conclusion	Appraisal: Worth to Practice/Level
Sun R et al., 2019.	Meta-analysis level II Design: Meta-analysis of RCT level I studies to determine the efficacy of non-needle acupoint stimulation on PONV Method: Systematic searches were conducted in PubMed, Embase, Cochrane, and Wanfang Med Online databases for inclusive studies.	N= 199 records. N=136 screened after duplicates removed 115 records removed 21 assessed for full eligibility 14 studies of 1009 female patients found eligible Setting: NR	IV=Wristband PC6, LI4, ST36, LI11, SJ5 acupressure application points DV = nausea, vomiting, comfort level	Data extraction and risks of bias evaluation were accomplished by 2 independent reviewers using the Cochrane Collaboration Review Manager software	95% CI Heterogeneity of data found to be above 50%	Half of studies indicated that non-needle acupoint is more effective for PONV Data from 3 studies indicated that non-needle acupoint is effective in treating nausea and vomitin	Acupressure at P6 point in post-surgical breast surgery patients is preferrable to antiemetics	*****Weaknesses: limited number and quality of studies

		Attrition = NR				g with 6 Hours post-op.		

Citation	Design/Method	Sample/Setting	Major Variables Studied	Measurement And Data Analysis	Findings	Results	Conclusion	Appraisal: Worth to Practice/Level
Zhang Y et al, 2020.	Systematic review and meta-analysis level II Design: Meta-analysis study that searched databases for RCT level I records to determine the effectiveness of PC6 acupuncture point for PONV in children Method: Four databases (MEDLINE, EMBASE, CENTRAL, and Chinese Database of Biology and Medicine) were searched from inception until	N= 16 studies with 1773 PTs, Setting: NR Attrition= NR	IV=pressure on PC6 point 0-4H and 24H post-op DV = nausea, vomiting, comfort level	Rev Man 5.3 software. Risk ratio (RR) was used as the effect measurement for all dichotomous outcomes Meta-analysis was performed using Mantel-Haenszel (MH) fixed-effects model or MH random-effects model according to the heterogeneity Cochrane Q test and I2 statistics were used to assess	95% CI yielded for risk ratio analysis Heterogeneity of samples was deemed satisfactory to use fixed and random effects No publication bias reported	Acupressure at PC6 point is effective in reducing early stages (0-4H) POV and 0-24H PON Acupressure at PC6 point ensured overall comfort level	Acupressure at P6 point in post-surgical children population effective in reducing PONV	Weaknesses: Study was only conducted on children's patients Only one acupoint PC6 evaluated

	January 16, 2019 Systematic review using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses			the heterogeneity Funnel plot with Egger test was used to evaluate the possible publication bias				

Citation	Design/ Method	Sample/ Setting	Major Variables Studied	Measurement And Data Analysis	Findings	Results	Conclusion	Appraisal: Worth to Practice/Level
Hsiung WT et al,, 2015.	RCT level I Design: randomized controlled trial. Participants were randomly assigned to either the control group or experimental group Method: Two groups studied: control group received regular postoperative care,	N= 60 PTs, active group= 26, control group=28 6PTs withdrew Setting: 141-bed general surgery ward at a 3000-bed medical teaching hospital in Northern Taiwan Attrition = 10%	IV= P6 and ST36 acupoints stimulation DV = nausea, vomiting, digestive comfort	Data were analyzed using IBM SPSS Version 20.0 for Windows. An 11-point scale was used to assess pain intensity, The Rhodes Index of Nausea, Vomiting, and Retching (INVR) were used to assess the severity of PONV	Intervention group showed significant improvement for PONV compared to control group 87.03% exhibited a normal defecation status. No significant group differences were observed at the baseline (t = 0.09, P = .93)	Acupoint stimulation elicited a gradual decrease in PONV, pain and improved gastric motility during the first 3 days following surgery. Acupoint is more effective improving overall patient	Acupoint in post-surgical gastric cancer patients is preferrable to antiemetics	*****Weaknesses: cannot determine long-term effects of acupressure No placebo acupressure

	whereas the experimental group received acupressure for 3 days in addition to regular care					gastric comfort level post-op		

Citation	Design/ Method	Sample/ Setting	Major Variables Studied	Measurement And Data Analysis	Findings	Results	Conclusion	Appraisal: Worth to Practice/Level
Feng C et al., 2013.	RCT level I Design: randomized, prospective, double-blinded clinical trial investigating the effect of acupressure in patients with a history of PONV and motion sickness Method: Randomization of participants into 3	N= 150 PTs, active group= 50 sham group=47, control group=53 Setting: Post Anesthesia Care Unit (PACU) Attrition = NR	IV=auricular acupressure application point Adhesive tape only for sham group No intervention for control group DV = nausea, vomiting, comfort level	24H survey for data collection univariate analysis Pair-wise comparisons	Patients in the intervention group reported less PONV incidences or symptoms in the PACU and within 24H post-op Null hypothesis of equal means as a function of the intervention group ruled out	Auricular acupressure proved significantly more effective than antiemetics in treating PONV in intervention group compared to sham and control groups.	Auricular acupressure post-surgically is preferrable to antiemetics	*****Weaknesses: Study was only conducted on in PACU patients who are at high-risk for PONV Sample patients had laparoscopic surgeries only, future studies are needed to find out if acupressure is beneficial for longer more complex surgeries

	study groups to study the effect of auricular acupoint stimulation using 24 cart gold plated surgical steel pellet in 3 areas of the ear: triangular fossa, point zero and subcortex point.				Age and gender determined as significant covariates for all 3 groups			

Citation	Design/Method	Sample/ Setting	Major Variables Studied	Measurement And Data Analysis	Findings	Results	Conclusion	Appraisal: Worth to Practice/Level
Morehead A & Salmon G., 2020.	Systematic review level II Design: systematic review of randomized control trial studies to investigate the efficacy of acupuncture/acupressure on PONV for multiple patient populations Method: review of 6 pooled RCT studies encompassing 59 trials found on the Cochrane database between 1986-2015 with 7677 patients	N= 150 PTs, active group= 50 sham group=47, control group=53 Setting: Post Anesthesia Care Unit (PACU) Attrition= NR	IV=Wristband PC6 acupressure application point DV = nausea and vomiting	Cochrane Q test and I2 statistics were used to assess the heterogeneity Risk ratio (RR) analysis	Heterogeneity of samples deemed satisfactory 95% CI yielded RR analysis	PC6 acupuncture 30 minutes before and up to 72 hours after surgery significantly increased the complete responses to treatment (68%) compared with before	Acupressure at PC6 point in post-surgical patients is more effective when administered before and after surgery	*****Weaknesses: Study was conducted over a long period of time; patient samples and reported answers not consistent. Strengths: This study reviewed many patient populations and can be confident in the validity of results.

						surgery only (43%)		

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Acupressure to Decrease Postoperative Nausea and Vomiting (PONV) compared to Ondansetron in patients undergoing laparoscopic procedure, an evidence-based Educational Module.

By Frances Noziere BSN, RN

FIU

Learning Goals

This quality improvement project will:

Discuss the prevalence of PONV in postoperative patients

Identify risk factors of PONV (populations, surgery types)

Discuss consequences of PONV when left untreated

Discuss what is lacking in current treatment

Demonstrate knowledge of Neiguan point (P6) acupuncture and its benefits for PONV

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Background

PONV affects over 80% of high-risk patients and 30% of all surgical patients[1].

Quick recovery time associated with laparoscopic surgeries nullified with PONV complications

Debilitating side effects of ondansetron call for better treatment.

P6 acupoint acupressure identified as potential better management method[1,2,3,4]

FIU

Risk Factors

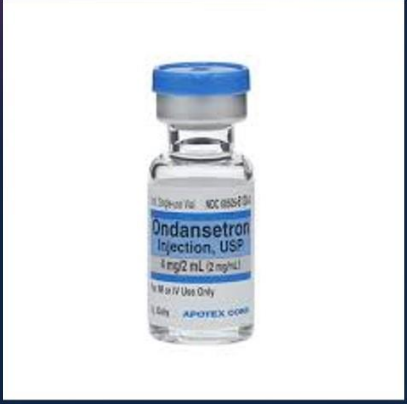
Three types of risk factors

- Patient: Post pubescent females are 3X more likely to get PONV
- Patients with a history of motion sickness, obesity, diabetes, hypothyroidism, PONV, and opioid users and non-smokers[4,5].
  - Surgical: Abdominal, cholecystectomy, gynecological and laparoscopic surgeries
  - Anesthetic: General anesthesia as a higher risk factor than regional and local anesthesia[4,5]

PONV Complications

- PONV leads to complications debilitating to postoperative surgical patients
- Fluid and electrolyte imbalance, hypovolemia, pulmonaryaspiration, wound dehiscence, delayed recovery and increased hospital costs[6]

Shortcomings of Ondansetron



- Ondansetron an antiemetic and first line of treatment for nausea and vomiting[7].
- A 5-hydroxytryptamine (5-HT_{3}) antagonist serotonin receptor
- Regulates motility and relays information in the gastrointestinal tract
- Can cause unwanted side effects such as drowsiness, headache, fatigue, increased sedation and constipation in postoperative patients[8].

P6 Acupressure Point

- Pericardium (P6) acupressure point called Neiguan point and found on the inner arm close to the wrist
- Traditional holistic eastern medicine treatment utilized as a nausea, vomiting and pain treatment
- Not recommended when the site has broken skin or open wounds[9,10]

P6 Acupressure Point

- Pressure is put on P6 point near the inner wrist in the surgical setting with Needles or Wristband
- Intradermal thumbtack needle inserted in the P6 points bilaterally and manually stimulated on demand[1,2,3,4,5]

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Mechanism of Action

- Pressure put on the P6 site relaxes muscles and improves blood flow
- Increases the release of endorphins and facilitating a feel-good sensation[6,7,8]. Decreases the release of serotonin, thus reducing the effect of the transmitter associated with PONV
- Increases gastric movement or peristalsis, thus reducing incidences of nausea and vomiting[9,10]

Clinical Advantage Points

- Acupressure is used as a form of complementary therapy for PONV relief
- Research supports its effectiveness compared to ondansetron
- Patients reported a decrease for ondansetron
- Acupressure carries no side effects
- Increased patient satisfaction due to effectiveness of treatment and no adverse effects[8,9,10]

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Acupressure to Decrease Postoperative Nausea and Vomiting (PONV) Compared to Ondansetron in Women Undergoing Laparoscopic Surgery

Frances Noziere MSN, RN

Fernando Alfonso, DNP, CRNA, APRN

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Background

PONV affects over 80% of high-risk patients and 30% of all surgical patients[1].

Quick recovery time associated with laparoscopic surgeries nullified with PONV complications

Debilitating side effects of ondansetron call for better treatment.

P6 acupoint acupressure identified as potential better management method[1,2,3,4].

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Problems

Increased prevalence of PONV. [1]

Causes discomfort, patient dissatisfaction, delaye recovery, and readmissions

30% of surgeries

80% in high-risk patients. [2,3]

Current treatment (ondansetron) comes with adve reactions: drowsiness, headache, fatigue, constip

FIU

Problems

- Three types of risk factor
- Patient: Post pubescent females
- History of motion sickness, obesity, diabetes, hypothyroidism, PONV,
- Opioid users and non-smokers[4,5]
- Surgical: Abdominal, cholecystectomy, gynecological and laparoscopic surgeries
- Anesthetic: General anesthesia.[4,5]
- PONV leads to complications debilitating to postoperative surgical patients
- Fluid and electrolyte imbalance, hypovolemia, pulmonary, aspiration, wound dehiscence, delayed recovery and increased hospital costs

DNP Project Purpose

- Assess the understanding and attitude of anesthesia providers concerning P6 acupressure as a valid treatment method
- Initiate a discussion about the benefits of P6 acupressure among anesthesia providers
- Demonstrate knowledge of Neiguan point (P6) acupuncture and its benefits for PONV
- Discuss the prevalence of PONV in postoperative patients and current treatment progress among providers
- Identify risk factors of PONV (populations, surgery types)
- Discuss consequences of PONV when left untreated
- Discuss what is lacking in current treatment

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PICO Clinical Question

- In women undergoing laparoscopic surgery (P), does preoperative acupressure (I) in comparison to ondansetron (C) decrease postoperative nausea and vomiting (O)?
- Population (P): Women undergoing laparoscopic surgery
- Intervention (I): Acupressure
- Comparison (C): Ondansetron
- Outcomes (O): Improved PONV

FIU

FIU

QI Project Methods

- Goal of QI project is to evaluate P6 acupressure knowledge
- Obtain permission from IRB
- Performed in level 1 trauma hospital
- Current anesthesia providers as participants
- Survey as pre-test and post-test questions
- Email volunteers survey question and learning material
- Collect answers to determine learning differentials using Qualtrics

QI Project Methods: Sample

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- **Total Participants: (n=10, 100%)**
- **Doctorate degrees (n=5, 50%)**
- **Masters (n=5, 50%)**
- **Age group of 25-34 (n=5, 50%)**
- **Age group of 35-44 (n=5, 50%)**
- **7 female (n=7, 70%) and 3 males (n=3, 30%)**
- **Caucasian (n=3, 30%), African American (n=4, 40%), Hispanic (n=2, 20%), and other (n=1, 10%)**
- **Medical doctor (n=1, 10%), CRNAs (n=9, 90%)**

QI Project Results: Pre-Test

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- **Questions:** **% Correct answers**
- Risk factors for PONV: 10%
- Consequences of untreated PONV: 90%
- Adverse reaction on ondansetron: 80%
- Placement of P6 acustimulation : 80%
- P6 acupuncture reduced PONV: 80%
- P6 acustimulation increased patient satisfaction: 9%
- Mechanism of action of P6 acustimulation: 40%
- Effects of TEAS: 60%
- Other name for P6 acupressure point: 40%

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QI Project Results: Post-Test

- Mixed results: Overall increase in correct answers

Questions:	**% Correct answers**	**Differentials**
Risk factors for PONV:	10%	0%
Consequences of untreated PONV:	78%	-12%
Adverse reaction on ondansetron:	90%	10%
Placement of P6 acustimulation :	80%	0%
P6 acupuncture reduced PONV:	100%	20%
P6 acustimulation increased patient satisfaction:	90%	81%
Mechanism of action of P6 acustimulation:	78%	38%
Effects of TEAS:	67%	7
Other name for P6 acupressure point:	78%	38%

QI Project Results: Prospects for Practice

If available at your facility, how likely are you to use P6 acustimulation as adjunctive therapy to prevent or treat PONV?	Pre-Test	Post-test	Difference
Extremely likely	30	78	48
Somewhat Likely	30	22	-8
Neither likely nor unlikely	30	0	-30
Somewhat Unlikely	10	0	-10
Extremely unlikely	0	0	0

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Discussion: QI Project Strengths and Limitations

- Well rounded sample demographically
- Licensed anesthesia providers
- Half of participants had DNP
- Not enough participants
- Only one method of study recruitment
- Lack of engagement from participants
- Inability to compare effectiveness of various education methods

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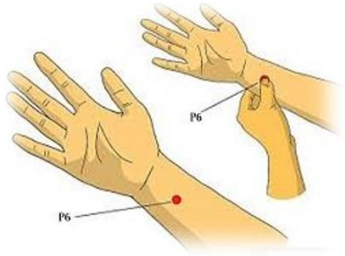
Discussion: QI Project Outcomes



- Assessed the gap of PONV prevalence and risk factors
- Assessed pre and post-test knowledge of P6 acupressure
- Demonstrated participants willingness to learn about P6 acupressure
- Post test results demonstrated an improvement in knowledge and attitude on P6 as treatment method

Conclusion

Research supports Acupressure therapy for PONV relief compared to ondansetron. [1,2,3,4,5]

Increased patient satisfaction due to effectiveness of treatment and no adverse effects. [8,9,10]

There is a need for further research to become evidence-based practice

Educational module study results show patient reported increased effectiveness of acupressure

Educational module shows acupressure P6 application technique needs adequate training and education

QI project exposes the lack of education and exposure of this alternative in the clinical setting.

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