Original Article

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Effect of Implementing Acupressure Technique on Gastrointestinal Problems and Pain Control for Children Post Abdominal Surgeries

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ABSTRACT

Background: Abdominal surgeries are defined as procedures carried out by surgeons for the children's abdominal regions for treating a medical condition. Pediatric surgical problems are a broad spectrum of surgical condition that occurs in children. Sometimes, it is considered a proper option of pediatric management to save children's lives and prevent and decrease disabilities and death. **Aim:** The study aims to evaluate the effect of the acupressure technique on gastrointestinal problems and pain control for children post-abdominal surgeries. **Methods:** The design of the study was a quasi-experimental research design and used for 80 children from the Tanta Main University Hospital's pediatric surgical department. Three Tools were used to collect data: A structured Interview Schedule to assess the socio-demographic characteristic and medical history of children, a Rhodes index of nausea and vomiting form to assess nausea and vomiting, and a visual analog scale to assess nausea , vomiting and pain. **Results:** The results of the current study found statistically significant differences in the occurrence of postoperative nausea, vomiting, and pain on the first and second days following implementation. **Conclusion:** There are a significant improvement in the children's nausea, vomiting, and pain after abdominal surgeries. **Recommendation:** Acupressure should be utilized as a collaborative nursing intervention method to minimize post-operative gastrointestinal side effects (nausea and vomiting) in pediatric surgery patients.

Keywords: Children; Acupressure Technique; Abdominal Surgeries; Nausea; Vomiting; Pain

INTRODUCTION

Abdominal surgery in children can involve various techniques that depend on the organs which require an operation such as the stomach, liver, and gallbladder. There are two types of abdominal surgeries laparotomy and laparoscopic surgeries. Firstly, Laparotomies are defined as major surgeries which need large incisions on the abdomen of children and require extended time for recovery. On the otherhand, laparoscopic surgeries are smaller incisions made significantly than Laparotomies, so, they make little scars, less blood loss, decreased pain after surgery, and faster recovery (Zaghal & El Rifa, 2021).

The common indication for abdominal surgeries in children is an appendectomy, resection of abdominal hernia, cholecystectomy, and pancreatectomy (Di Saverio *et al.*, 2020). Appendectomy is a surgical procedure that is done for the removal of the appendix through laparotomy and laparoscopy surgery. Laparoscopic surgery is recently preferred for uncomplicated conditions more than the open appendectomies. It is preferred because it has small incisions with little pain and fast recovery. While the open operation may cause suspected infection and formation of an abscess (Sartelli, Baiocchi & Saverio, 2018).

Appendicitis is an inflammation of the appendix which leads to the formation of pus. This pus can cause pain starting on the belly button and then spreads lower to the right side of the abdomen (Garbuzenko, 2018).The appendicitis pain can worse when the child cough or walk so it needs proper and fast surgical treatment. Along with pain the child may have nausea, vomiting, and diarrhea (Peter & Snyder, 2016).

Cholecystitis is inflammation of the gallbladder that occurs because of gallstones in the cystic duct and obstructing it (Dimitri & Vitali, 2018). Acute pancreatitis is an inflammatory condition of the

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pancreas. It can cause severe pain that increases very fast and sometimes it may cause death. A hernia is the protrusion or pushing of internal organs of the abdomen through muscles and the wall of the cavity. Hernias are common in children and required various measures of treatment than an adult. It can occur due to weakness in the muscles of the abdomen in which part of the intestine may push through the weak area (Alrzoq, Alhaji & Alolayt, 2018).

Nausea and vomiting are postoperative gastrointestinal problems that may occur after operation and administration of anesthesia. It is distressing for the child and can lead to postoperative complications. Nausea is the unrest in the children's stomach that occurs and is followed by vomiting. Vomiting is the forceful evacuation or bringing out the contents of the stomach from the mouth either voluntary or involuntary (Urits, Orhurhu & Jones, 2020).

Postoperative pain occurs as a result of tissue damage caused by surgical incisions that occurs shortly after surgery. It leads to the production of cellular breakdown and inflammatory mediators which trigger the nerve ending and send messages through the dorsal horn to the brain. The end effect of this pain transmission neuronal activity is pain perception (Pogatzki, Segelcke & Schug, 2017).

Non-pharmacologic measures are more effective in treating postoperative pain for children undergoing abdominal surgery. Acupressure is a non-invasive form of Traditional Chinese Medicine and is common throughout Chinese society as a method of promoting health. It includes the applying of pressure manually to certain points on the body through energy pathways called meridians which spread energy in the body and connect the body parts with its organs. Appling acupressure technique can be done by using the fingertips or wristband to relieve post-operative nausea, pain and vomiting (Mahna & Ouda, 2020).

Pediatric nurses play a vital role in caring for children with abdominal surgeries and suffering from nausea, vomiting, and pain. They should be aware while giving information about the surgery to children and their families. The information provided to the family should be clear, consistent, suitable, and in scientific language but simplified according to the level of education of the patient. The pediatric nurse should also assess the child's pain, nausea, vomiting characteristics, and severity (El-Moazen, Mohamed & Kereem, 2018) .

Significance of the Study: Postoperative gastrointestinal problems and pain are the problems for children following abdominal surgeries which can be managed by administrating the pharmacological agents. Now, there are many non-pharmacological strategies used in treating post-operative complications such as acupressure. Acupressure therapies are a prompt method in decreasing the gastrointestinal problems of children post-operatively and improvement of children's condition. Therefore implementing acupressure technique is important to decrease nausea, vomiting, and pain and its complications in post abdominal surgeries.

The aim of the study was to examine the effect of the acupressure technique on gastrointestinal problems and pain control for children post-abdominal surgeries.

Research Hypothesis

H1-Children who receive acupressure techniques are expected to experience little nausea and vomiting post abdominal surgeries than the control group.

H2-Pain is expected to be decreased after using the acupressure technique in the acupressure group compared to the control group.

METHODOLOGY

Subjects

Research design: Quasi-experimental research design was used in this study.

Setting: The study was carried out at Tanta Main University Hospital's paediatric surgical department. About 80 children with post-abdominal surgeries were included in the study who were admitted in the previously mentioned settings. Children were selected randomly and equally and were divided into two groups; each group consisted of 40 children post abdominal surgeries **Acupressure group:** Consisted of 40 children with post abdominal surgeries who received acupressure technique at P6 and Le7 acupoints in addition to the routine hospital care as prescribed medication. **Control Group:** Consists of 40 children with post abdominal surgeries who received routine hospital care as prescribed medication.

Inclusion criteria of children:

- Both sexes were included
- Age ranged from 6-12 years.
- Children undergoing abdominal surgeries such as

acute appendicitis, Inguinal and umbilical hernia, cholecystitis and pancreatitis.

- Free from any other diseases as cardiac and renal diseases.

Tools of data collection: (three tools were used for data collection)

Tool I: Structured interview schedule:there were two parts:

Part (1): Biosocio-demographic characteristics of the children

1. Socio-demographic data of children post abdominal surgeries such as age, sex, academic year, date of admission, and residence.

2. Medical history as diagnosis, type of surgery, the onset of the condition, prescribed medication and body weight of children

Part (2): Assessment of gastrointestinal problems for children post abdominal surgeries. It included :

a) Items linked to nausea as: occurrence, frequency and duration of nausea after surgery, aggravating, alleviating factors and associating symptoms.

b) Items connected to vomiting such as: vomiting experiencing after surgery, amount of the vomitus, consistency, frequency of vomiting, and consuming the antiemetic medication.

c) Items related to pain such as; the presence of pain after surgery, assessment of pain, duration, frequency, the intensity of pain, and prescribed analgesic

Scoring system for frequency:

- 0= None
- 1= 1-3 times
- 2=4-7 times
- 3 =7 and more

Tool II: Rhodes index of nausea and vomiting form: Rhodex created this utility in the year 1999. This is five-point likert-type self-report questionnaire that have an eight-itemand measures patient nausea, vomiting, and retching on paper. The children are encouraged to circle or mark through the sentence in each row that most closely resembles their experience. Three subscales are available: three-item subscales for nausea (0-12), three-item subscales for vomiting (0-12), and two-item subscales for retching (0-12). Scores on the subscales for nausea and vomiting can be calculated separately.

The total score has a range of 0-32:

- Much better (0)
- Better (1-8)
- Same better (9-16)
- Worse (17-24)
- Much worse (25-32).

Tool III: Pain Visual Analogue Scales (PVAS). Fairbank, Davies (1980) created this tool which was later updated by Baxter (2011). It's a self-reported verbal descriptive scale for reporting subjective data on gastrointestinal problems (nausea and vomiting). It was created as a way to assess the intensity of pain.

No nausea /vomiting/ pain = 0

Mild nausea /vomiting/ pain =1 > 4

Moderate nausea /vomiting/ pain =4 > 7

Great nausea /vomiting/ pain = 7 > 10

Severe nausea /vomiting/ pain = 10

The study was achieved through the following steps:

• An official permission for data collection was required from Tanta University's Dean of Faculty of Nursing, and it was guided to administrators responsible for the pediatric surgical department of Tanta University Hospital to gain their agreement and permission to complete the study after clearing the purpose of this study.

• Ethical and legal considerations: the information obtained from the children and their mothers was informed of confidentiality. Oral consents of the children and their mothers were obtained to participate in the study after the researcher explained its aim, benefits, and the right at all times to withdraw from the study

• Data was gathered using three different tools.

• Internal consistency was used to test the tool's reliability. Cronbach's alpha coefficients for the tool I and II were 0.975 and 0.92, respectively.

• Content validity: A panel of five pediatric nursing professionals reviewed the study materials to ensure that the content and clarity of the questionnaire were valid. The validity index for the questionnaire was 98.5%, and it was calculated based on expert opinions.

• A pilot study was conducted with eight children

(10%) to examine the tool's clarity, application, feasibility, and required improvements. The study did not include the pilot sample.

Phases of the study: The study was conducted through four phases:

1. **Assessment Phase:** It was done by the researcher to assess children who met the inclusion criteria. The researcher firstly met the children and their mothers to explain the purpose of the study to gain their cooperation.

-In the previously indicated setting, the researcher was accessible two days each week alternately.

2. **Planning Phase:** Preparation of the child before applying the acupressure technique by applying light and comfortable clothes and explaining the acupressure technique to their mothers.

• Preparation of environment. It was a warm, well-ventilated room and privacy was also maintained.

• Preparation of the nurse. Nurse's fingernails should be short to avoid injury to the child's skin

3. **Implementation Phase:** Before applying the acupressure technique, the researcher made a need assessment before intervention for each child separately using the tool I part (2) and Tool II and accordingly designed the plan for each acupressure session.

• The acupressure technique was carried out for each child individually 8 hours after surgery.

• The researcher received training on acupressure therapy for children before starting the study by the physiotherapist.

Acupressure Intervention

The acupressure session. It was applied on the first and second day.

Steps of Pericardium six (P6) acupoint (two sessions)

I). Locate the pericardium six acupoints on the palmar aspect of the forearm, 2 cun above the transverse crease of the wrist, between the palmaris longus and flexor carpi radials tendons, on the palmar aspect of the forearm.

ii) The 2cun measurement was determined by taking measurements of each child's three fingers in the dorsal aspect at the level of the proximal interphalangeal joint of the middle finger and converting it to the centimeter.

iii) The researcher measured the breadth of the child's wrist with a tape measure

iv) In a clockwise direction, the researcher pressed on the PC6 acupoint with the thumb for 10 minutes in each arm in a circular motion, holding for a few seconds and then gradually releasing it.

v) The pressure is applied gently, steadily, and firmly by the researcher. For 10 minutes, gradually push directly into a point with the thumb at a 90-degree angle from the skin's surface. The acupressure technique is carried out for each child individually one time daily for 20 minutes before a meal for two days using Tool (II) and Tool (III)

Lanwei (Le7) Acupressure

i) Determine the Lanwei (Le7) acupoint which is located below the right knee on the anterolateral side of the leg with a distance of 2 cun from the St36 (Zusanli) acupoint, one finger breadth from the anterior crest of the tibia.

ii) The measurement of the distance from St 36, which is obtained by measuring the width of each child's four fingers in the dorsal aspect at the level of the proximal interphalangeal joint of the middle finger and converting to centimeter. The previous measurement of 2cun was added to the calculation.

iii) The researcher measured one finger breadth from the front crest of the tibia, then positioned the tape measure below the child's patella for the predetermined cm.

iv) The researcher pressed on Le7 point on the right leg in a circular motion for ten minutes with a thumb, holding it for a few seconds before gradually releasing it in a clockwise direction.

v) The researcher applied pressure gradually, with steady and firm pressure. Gradually press directly into a point with the thumb at a 90º angle from the surface of the skin for ten minutes.

vi) The acupressure technique is carried out for each child individually one time daily for two days by using Tool (II) and Tool (III).

4. **Evaluation Phase:** Evaluation of the effect of acupressure was carried out twice, on the 1st and 2nd day post-operative using the same tools (the tool I part 2, tool II, tool III). Each child was evaluated for nausea, vomiting, and pain immediately after the implementation of the acupressure technique.

From the beginning of August 2020 to the beginning of January 2021, data is taken throughout these six months. The fieldwork took a year to complete.

Statistical Analysis:

Using SPSS software, the acquired data was processed, tabulated, and statistically evaluated

(Statistical Package for the Social Sciences l Package for Social Sciences, version 23, SPSS Inc. Chicago, IL, USA). Range, mean, and standard deviation were calculated for quantitative data. The Chi-square test was used to describe a categorical set of data by frequency, percentage, or proportion of each category, compare two groups, and more for qualitative data (2). The student *t*-test was used to compare the means of two groups of parametric data from independent samples. Pearson's correlation coefficient was used (r). To interpret the findings of significance tests, the significance level was set at *P* 0.05 (Beth & Robert, 2019).

RESULTS

Table 1 shows the socio-demographic characteristics of the study children. It was found that 60% of children in the acupressure group were in the age ranged from 10 to 12 years compared to 57.5% of the control group. While only 12.5% and 10% of the acupressure and control group respectively ages ranged between 6<8years with a mean age of 9.7±1.9 and 9.8±1.5 respectively. Males made up more than half (52.5%) of the acupressure group compared to 67.5% of the control group. It was also found that the majority (82.5%) of children were living in rural areas. As illustrated in figures (1,2).

Table 1: Percentage Distribution of the Studied Children According to Biosocio-Demographic Characteristics of the Children

Biosocio-Demographic Characteristics of Children	Study (no. =40)		Control (no. =40)	
	No.	%	No.	%
Age (Years)				
6 < 8	5	12.5	4	10.0
8 < 10	11	27.5	13	32.5
10 – 12	24	60.0	23	57.5
Mean ±SD	9.7 ±1.9			9.8 ±1.5
Sex				
Male	21	52.5	27	67.5
Female	19	47.5	13	32.5
Educational level				
1st and 2nd Grade	5	12.5	10	25.0
3rd and 4th Grade	11	27.5	12	30.0
5th and 6th Grade	24	60.0	18	45.0
Residence				
Urban	7	17.5	10	25.0
Rural	33	82.5	30	75.0

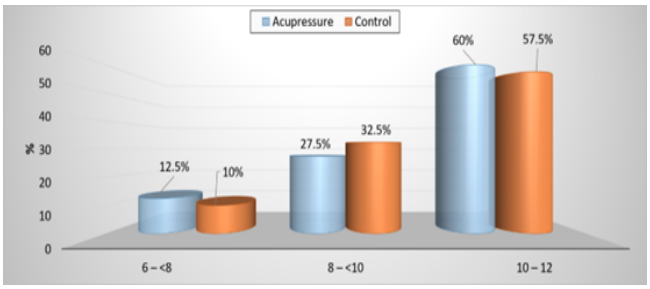

Figure 1: Age of the Studied Children

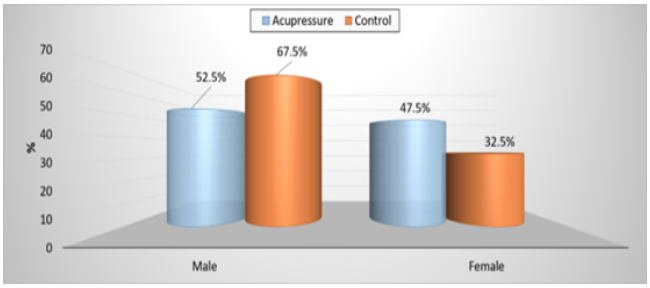

Figure 2: Sex of the Studied Children

Figure (3) describes the mean scores of visual analog scales related to nausea among studied children before and after implementation. Pre-implementation. the mean nausea score in the acupressure and control groups was1.8±0.5 and 1.9±0.3 respectively. It was also discovered that on the 2nd day after implementation, nausea's mean score in the acupressure group was (0.3 ±0.4), compared to 0.9 ±0.6 in the control group.

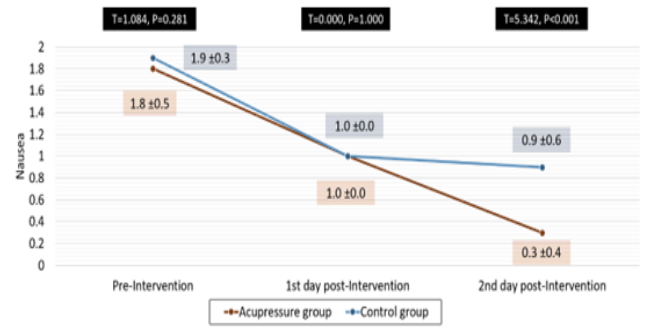

Figure 3: Mean scores of Visual Analog Scales among Studied Children for Nausea

Figure 4 illustrates the mean scores of visual analog scales related to vomiting among studied children before and after implementation. Pre-implementation, the mean score of vomiting in the acupressure and control groups was 2.2±0.3 and 2.3±0.5, respectively. It was also discovered that on 2nd day after implementation, the mean score of vomiting in the acupressure group was 0.3 ±0.5, compared to 01.2 ±0.8 in the control group.

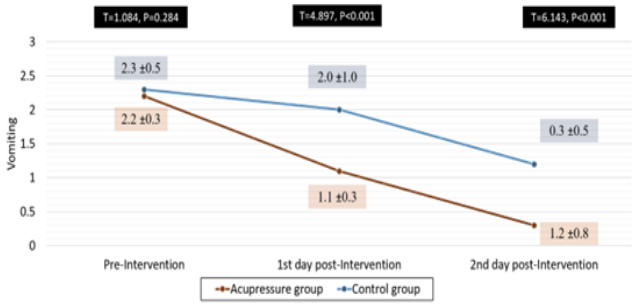

Figure 4: Mean Scores of Visual Analog Scales among studied children for vomiting

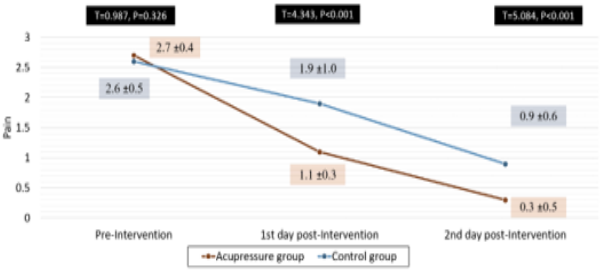

Figure 5: Mean Scores of Visual Analog Scales among studied children for pain.

Figure 5 shows mean scores of visual analog scales related to pain among studied children pre and post-implementation. Pre-implementation, the mean pain score in the acupressure and control groups was 2.7 ±0.4 and 2.6 ±0.5, respectively. It was also discovered that the acupressure group's mean pain score was 0.3±0.5, compared to 0.9 ±0.6 in the control group.

Table 2 portrays the correlation between Rhodes Index Scores Pre and Post Implementation among studied children. A highly statistically positive correlation was shown between Rhodes index scores of nausea and Rhodes index scores of vomiting and between Rhodes index scores of nausea also and retching *P*= <0.001 which means that with the increase in nausea there is an increase in both vomiting and retching.

Table 2:Correlation Between Rhodes Index Scores Pre and Post Implementation among Studied Children

Rhodes Index Scores	Study						Control					
	Rhodes index score of nausea		Rhodes index score of vomiting		Rhodes index score of retching		Rhodes index score of nausea		Rhodes index score of vomiting		Rhodes index score of retching	
	r.	*P*	*r.*	***P***	***r.***	***p***	***r.***	***P***	***r.***	***P***	***r***	***P***
Pre-implementation												
Rhodes index score of nausea												
Rhodes index score of vomiting	0.697	<0.001 **					**0.750**	**<0.001****				
Rhodes index score of retching	0.745	<0.001 **	0.871	**<0.001****			**0.839**	**<0.001****	**0.943**	**<0.001****		
Post-implementation1 day												
Rhodes index score of nausea												
Rhodes index score of vomiting	0.840	<0.001 **					**0.828**	**<0.001****				
Rhodes index score of retching	0.780	<0.001 **	0.715	**<0.001****			**0.740**	**<0.001****	**0.805**	**<0.001****		
Post-implementation2day												
Rhodes index score of nausea												
Rhodes index score of vomiting	1.000	<0.001 **					**0.895**	**<0.001****				
Rhodes index score of retching	0.882	<0.001 **	0.882	**<0.001****			**0.805**	**<0.001****	**0.747**	**<0.001****		

Table 3describes the correlation between visual analog scales pre and post-implementation among studied children. Positive a significant correlation between nausea and vomiting (*P*=0.003) in both acupressure and control groups. While Positive correlations were observed regarding nausea and pain in the acupressure and control group *P*=0.03 and 0.001 respectively. Significant positive correlations were identified between vomiting and pain in the control group.

Table 3: Correlation between Visual Analogue Scales scores Pre and Post Implementation among Studied Children Pre and Post Implementation

	Study						**Control**					
	Nausea		**Vomiting**		**Pain**		**Nausea**		**Vomiting**		**Pain**	
	r.	***P***	***r.***	***P***	***r.***	***P***	***r.***	***P***	***r.***	***P***	***r.***	***P***
Pre-implementation												
Nausea												
Vomiting	0.463	0.003*					0.463	0.003*				
Pain	0.343	0.030*	0.159	0.328			0.515	<0.001**	0.685	<0.001**		
Post-implementation1day												
Nausea												
Vomiting	0.000	1.000					0.000	1.000				
Pain	0.000	1.000	1.000	<0.001**			0.000	1.000	0.904	<0.001**		
Post-implementation2 day												
Nausea												
Vomiting	0.252	0.117					0.824	<0.001**				
Pain	0.032	0.843	0.086	0.600			1.000	<0.001**	0.824	<0.001**		

The mean Rhodes Index scores of the acupressure and control groups were shown in Table 4. On the 1st day (*P*=0.017) and the 2nd day after implementation (*P*=0.001), there were statistically significant differences in the mean scores of the Rhodes Index of nausea between the acupressure and control groups. There were also statistically significant differences in the mean Rhodes index of vomiting scores between the acupressure and control groups on the 1st day (*P*=0.003) and 2nd (*P*=0.001) days after implementation. On the 2nd day after implementation, statistically, significant differences were observed in the mean scores of the Rhodes Index of Retching between the acupressure and control groups (*P*=0.032).

Table 4: Percentage Distribution of Rhodes Index Scores among the Studied Children

	Study	**Control**	***T*-test**	
	Mean ±SD	**Mean ±SD**	***T***	***P***
Nausea				
Pre-Implementation	4.1 ±1.1	4.0 ±1.3	0.371	0.711
1st day post-Implementation	2.0 ±2.1	3.6 ±2.4	2.431	0.017*
2nd day post-Implementation	0.3 ±0.9	1.7 ±1.9	4.214	<0.001**
Vomiting				
Pre-Implementation	8.6 ±1.9	8.4 ±2.2	0.384	0.702
1st day post-Implementation	3.4 ±2.1	4.4 ±1.7	3.105	0.003*
2nd day post-Implementation	0.3 ±0.9	1.9 ±1.9	4.849	<0.001**
Retching				
Pre-Implementation	2.3 ±1.5	2.0 ±1.3	0.956	0.342
1st day post-Implementation	0.6 ±1.1	1.1 ±1.2	1.668	0.099
2nd day post-Implementation	0.3 ±0.7	0.7 ±1.1	2.189	0.032*

DISCUSSION

It is evident clearly, increasing nurses' understanding of the use of acupressure for children after abdominal surgeries is critical in alleviating and improving the management of vomiting, nausea, and pain in these children. Nurses are kept up to date on the newest improvements in nursing care for these children through ongoing education. As a result, the purpose of this study was to see how introducing acupressure technique affected gastrointestinal disorders and pain control in children who had abdominal operation.

More than half of the children evaluated in this study were between the ages of 10 and 12, with a mean age of (9.7±1.9). Males made up more than two-thirds of the study participants. According to El-Moazen *et al* (2018), the study examined the impact of preferred active play on preoperative fear and anxiety in children undergoing abdominal surgeries, and discovered that half of the children studied were between the ages of 10 and 12, with a mean age of 9.2±2.3 years and more than half of the children studied being male.

The findings demonstrate that there were statistically significant differences in the mean scores of visual analogue scales of nausea and vomiting on the first and second days after intervention. This suggests that acupressure stimulation at Pericardium 6 (PC6) can help children recover from surgery with less nausea and vomiting. These findings backed up those of Miao & Kauret (2017), who conducted a systematic review with meta-analyses and trial sequential analysis of randomised controlled trials to look at the effects of acupressure on chemotherapy-induced nausea and vomiting and found that the acupressure group had lower scores for mean intensity of delayed nausea and vomiting and frequency also assessed after implementation than the control group.

In contrast, the current findings contradict those of Genc *et al.*, (2013), who conducted a study to examine the efficacy of acupressure in preventing nausea and vomiting of patients receving chemotherapy and concluded that the acupressure band did not improve or prevent nausea as side-effect of chemotherapy . This is due to the fact that applying acupressure with your fingertips is more effective than using an acupressure band.

On the first and second days following intervention, there was a statistically significant difference in mean pain scores. These findings matched with those of Mohsen & Mahmood (2013), who looked into the effect of Le7 acupressure on post-appendectomy pain and discovered that the Lanwei Le7 group had lower mean post-operative pain intensity than the control groups. Pouy's *et al.*, (2019) observations corroborated the current findings. A randomised, single-blind, placebo-controlled trial on the effect of acupressure on post-tonsillectomy pain in adolescents showed a significant difference in pain level before and after acupressure application during the three different periods following the tonsillectomy procedure in the acupressure group.

In the current study, a positive correlation between nausea and vomiting was discovered significantly in both the acupressure and control groups, indicating that an increase in nausea can lead to an increase in both vomiting and retching, and that nausea/ retching was preceded by vomiting and a desire to vomit. Mohammed *et al.*, (2018), conduct a study about the impact of acupressure nausea and vomiting in children diagnosed with leukemia and taking chemotherapy. The study found that when it came to the correlation between sensation of nausea and occurance of vomiting, a positive correlations was observed between reduction of nausea and vomiting, as well as reduction of delayed symptoms of nausea and vomiting.

In terms of the correlation between nausea, vomiting, and pain, a positive correlation was discovered between the acupressure and control groups on the first day following implementation, implying that as nausea rises, so does vomiting and pain. Patients with a history of post-operative nausea and vomiting and post-operative pain were significantly associated with the occurrence of PONV, according to Namrouti *et al.*, (2021), who studied assessment of pain and postoperative nausea and vomiting and their relation in the early postoperative period: an observational study from Palestine. Pain was reported by the majority of individuals during the first 24 hours after surgery.

In light of the Rhodes index's mean score in the acupressure and control groups. After the intervention, there was a statistically significant differences in the mean Rhodes index of nausea, vomiting, and retching between the acupressure and control groups. This explains why acupressure at Pericardium 6 (PC6) was shown to be an effective method of minimizing post-operative nausea and vomitin.

The current findings were consistent with those of Esmail *et al.*, (2014), who compared the effects of progressive muscle relaxation versus acupressure on chemotherapy-induced nausea and vomiting in leukemic children and discovered that the mean differences in total nausea and vomiting scores between the two groups were measured using the Rhodes Index Scale. Total anticipatory nausea and vomiting were observed to occur considerably less frequently in the acupressure group than in the control group.

Genç *et al.*, (2013), examined the effects of acupressure on chemotherapy-induced nausea, vomiting, and anxiety in breast cancer patients, came to the same conclusion as the current findings. They discovered that the acupressure group's mean scores for nausea, vomiting, and retching were statistically considerably lower in the acupressure group than in the control group. Finally, the current study found that after abdominal procedures, children experienced less nausea, vomiting, and pain. This could be attributed to the influence of acupressure technique application, which has a reasonable effect on gastrointestinal disorders and pain control. The overall mean score of nausea, vomiting, and retching in the acupressure group was lower than in the control group, with a statistically significant difference in frequency, severity, and duration between the two groups.

CONCLUSION

Based on the outcomes of the present study, it can be stated that for children who had abdominal surgeries, utilising the acupressure technique during the first and second days post-intervention resulted in a considerable improvement in the average scores of nausea, vomiting, and pain. There was a positive correlation between the overall ratings of nausea, vomiting, and pain among the children examined after abdominal procedures.

Recommendations

1. Acupressure should be utilised as a collaborative nursing intervention method to minimize post-operative gastrointestinal side-effects (nausea and vomiting) in paediatric surgery patients.

2. Increase awareness for nurses is necessary about the importance of implementation of acupressure technique post abdominal surgeries for reduction of post-operative nausea, vomiting, and pain.

Conflict of Interests

The authors declare that they have no conflict of interests.

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