Efficacy of Acupressure on Post-Operative Pain, Anxiety Level and Sleep quality for Abdominal Surgical Patients

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Abstract

Background: One of the difficulties faced by surgical patients is pain; 60% of them report postoperative anxiety and mild to moderate discomfort. Acupressure is a complementary and alternative medicine therapy that promotes relaxation and pain relief. **Aim:** This study aimed to examine the efficacy of acupressure on post-operative pain, anxiety level, and sleep quality in abdominal surgical patients. **Study Design:** A quasi-experimental study design was utilized to meet the aim of the study. **Setting**: The study was conducted in the surgical unit, and outpatients at Minia University Hospital. **Subjects:** 80 patients were split evenly between the control and acupressure groups, with 40 patients in each. **Tools**: Four tools were used: a structured interviewing questionnaire, a numerical scale of pain, the state trait anxiety inventory, and the Arabic Pittsburgh Sleep Quality Index. **Results:** There was no significant difference in score of pain, anxiety and sleep quality before intervention among both groups, but post acupressure intervention the score in the Acupressure group was significant reduced pain, anxiety and sleep quality scores compared to control group (p<0.001). **Conclusion:** Acupressure is a useful intervention for easing pain, calming anxiety, and enhancing sleep quality. **Recommendations:** The study recommended training nurses to use acupressure as a useful method for controlling pain and anxiety and enhancing sleep quality.

Keywords: Acupressure, Postoperative, Pain, Anxiety, Sleep quality, Abdominal surgery

Introduction

As the life span of the population continues to rise, a theatrical increase in the number of digestive problems required for surgeries, accounts for up to 50% of total surgical costs. It is also among the most painful surgical procedures. One of the most common complaints after abdomen surgery is pain, and sleeping difficulty. This has many causes, including the anxiety to surgery, the pain, medications, and the hospital atmosphere (**Hossain et al., 2022).**

Pain is one of the most prevalent issues that patients deal with after surgery. The majority of patients cite postoperative discomfort as the worst part of surgery (**Maurer & Kaafarani, 2020**). According to reports, 60% of surgical patients endure mild to moderate pain, and 40% experience severe post-operative pain. With surgical patients, the discomfort brought on by the procedure, such as pain, can make them feel less comfortable (**Wahila et al. 2020**).

Anxiety is a state of trepidation and unease brought on by uncertainty about a potential threat or concerns about things that may not be understood in the future. More than 60% of patients report feeling anxious after surgery. People frequently express anxiety and worry about their ailment or its symptoms coming back or getting worse. Furthermore, patients may experience increased emotional discomfort, worry, and panic due to pain, limited mobility, and other circumstances. These unfavorable feelings may even have a significant impact on postoperative surgery and lengthen hospital stays. Effective postoperative anxiety intervention is therefore crucial for enhancing patients' quality of life in addition to pain management (**Sophie et al. 2020**).

The worldwide health problem of sleep disturbance in older individuals is linked to various surgical diseases. Sleep disruption should be viewed as a multifaceted geriatric and adult health problem that necessitates the evaluation of numerous risk factors and an all-encompassing therapeutic strategy. It includes a wide range of clinical disorders, including trouble falling asleep or staying asleep, excessive daytime sleepiness, and irregular sleep-wake cycles (**Tatineny et al. 2020**).

Sleep complaints have been reported in up to 40% of patients, particularly elderly patients who complained of sleep issues the first night following surgery. These issues adversely impacted the postoperative prognosis and outcomes and persisted for several days. Reduced quality of restorative sleep is detrimental to recovery and can have adverse effects such as changed pain perception, cognitive decline, metabolic disruptions, mood swings, and pro-inflammatory alterations (**Chouchou et al. 2019**).

Medication may be used to treat sleep disorders, but there are side effects that could occur, including tiredness, lack of focus, memory loss, and drug dependence. Long-term use of sleep medicines increases the risk of falls, accidents, and cognitive impairment due to these side effects. A non-pharmacological therapy method has been suggested to address sleep problems in the elderly and adults in order to prevent the side effects of sleep drugs (**Shang et al. 2019**).

Chinese traditional medicine serves as the source of inspiration for acupressure. Doctors, nurses, and even patients themselves could use acupressure, which balances the body's energy flow via touching techniques. A nurse or patient could utilize acupressure as a straightforward, non-invasive, inexpensive, and secure treatment after being instructed in the procedure (**Kirca, & Gül, 2021**).

Applying pressure to acupuncture points to promote relaxation and reduce discomfort is the foundation of acupressure, one of the complementary and alternative therapeutic modalities. Acupressure has the ability to enhance sleep quality while decreasing the frequency and dosage of sleeping pills. This may further cut down on the price and negative effects of sleeping pills. Acupressure is used to control the vital energy, also known as Qi, which keeps a person healthy and happy. Acupoints can be manually stimulated to relieve stress, increase blood flow, and boost immunity. Acupressure treatment modulates Qi flow inside the body or in a particular organ, restoring health and enhancing sleep (**Hmwe et al. 2019**). Acupressure has the power to ease discomfort and lessen pain. This encourages improving the quality of life for patients, reducing problems, and cutting down on hospital stays (**Khoram et al. 2022**).

Nurses should be actively involved in the intervention of pain, diagnose the patient under the direction of a nurse, use the pharmacological and non-pharmacological methods specifically designed for the patient, evaluate the results, and prevent potential problems by keeping the pain within tolerable limits.

Nurses spend more time with surgical patients than other healthcare professionals. Non-pharmacological approaches provide benefits such as being simple to use, lowering the degree of analgesic usage, protecting against potential adverse effects, and being cost-effective (**Smsek, 2019**).

Significance of the study

At the beginning of the postoperative phase, patients complain of significant abdominal pain and ask for pain medication. It could be challenging to administer anesthesia during this kind of operation, particularly during the day in medication. It could be challenging to administer anesthesia during this kind of operation, particularly during the day. Patients may have distress from inadequate analgesia paired with nausea and vomiting, which increases health care expenses because of a longer hospital stay (**Mohamed et al. 2022**).

Instead of using pharmacological therapy, consider using an alternative medicine to avoid or lessen these effects. Assessment, management, and associated anxiety levels should be seen as crucial aspects of nursing care that nurses should provide in addition to their tasks for those vulnerable patients. Since acupressure is a supplementary therapy, it is anticipated that it will be incorporated into the contemporary medical system as a successful non-pharmacological technique to control procedure discomfort and anxiety. It requires no equipment, is simple for patients to learn, lessens post-operative pain and anxiety levels, and enhances sleep quality (**Bassampour et al. 2019**).

Aim of the Study

This study aimed to examine the efficacy of acupressure on post-operative pain, anxiety level, and sleep quality in abdominal surgical patients.

Research Hypothesis

The current study hypothesized that:

- The acupressure technique will have positive effect on abdominal surgical patients by reducing their degree of pain severity and anxiety.
- The acupressure technique will have positive effect on abdominal surgical patients by enhancing their sleep quality

Subjects and Method

Research Design:

The current study used a quasi-experimental research design with study (acupressure group) and control groups. This design can be used to clarify a relationship, a specific event, or both. This method is also used to investigate causal relationships because the quasi-experimental design has less control than the experimental design in some respects. At least one of the following three categories was involved: 1) manipulation of the treatment variables; 2)

manipulation of the environment; or 3) subject selection. In clinical nursing studies, subjects are typically convenience samples rather than ones chosen at random. Thus, more quasi-experimental investigations are carried out by nurse researchers.

Setting:

The surgical department and outpatients at Minia University Hospital served as the site for the current study.

Subjects:

80 patients from both genders who agreed to participate in the study were included as a purposeful sample. They were divided into the study (acupressure group) and control groups at random.

Inclusion criteria:

▪ Patients had abdominal surgery.
▪ Patients gave their informed consent to take part in the current study.
▪ Patients who were not getting other complementary and alternative therapies at the time they were evaluated.

Exclusion criteria:

• Patients taking sleeping medicines on a regular basis
• Patients with severe neurological conditions or cognitive impairments such as dementia.

Calculating the sample size:

The sample size was determined by increasing the test's power to 80%, the confidence interval to 95% and the acceptable margin of error to 5%. The formula developed by Steven Thimpson was used to determine the sample size.

$$n = \frac{N \times P(1 - P)}{(N - 1 \times (d^2/z^2) + P(1 - P)}$$

N= total society size (500)
D= error percentage (0.05)
Z= the correspond stander class of significant 95% (1.96)
P= percentage of availability of the objectivity = (0.1)

Tools: *The data were collected through using the following four tools:*

Tool (I). Structured interview Questionnaire. It was divided into two parts as the following:

Part I: Personal characteristics of the patients under study: including their age, gender, marital status, level of education, occupation, and place of residence

Part II: Medical Information about the Patients as health history of chronic diseases, prior surgeries, and the length of hospital stay.

Tool (II). Numerical scale of pain: One of the most widely used pain scales is the numeric rating scale (NRS), which was adapted from **Jensen and McFarland (1993).** The NRS is a numerical version of the visual analogue scale, and its most popular form is

a horizontal line with an eleven-point numeric range, with zero representing no pain and ten the worst possible pain.

Scoring system on a numerical scale:

Level of pain	Score
Mild pain	**1 to 3**
Moderate pain.	**4 to 6**
Severe pain	**7 to 10**

Tool (III). Arabic form of State Trait Anxiety Inventory (STAI): This tool was used to assess anxiety levels and was adopted from **Abdel-Khalek, (1989)** & **Bahammam (2016).** The 40 items in the State Trait Anxiety Inventory are split into two subscales, each of which has 20 items. The state anxiety subscale (1–20) questions gauge patients' feelings under specific circumstances, while the trait anxiety subscale (21–40) questions gauge patients' feelings in everyday, common places.

Scoring system: The item scoring ranged from one to four: score 1 for "not at all, score 2 for "little, score 3 for "somewhat," and score 4 for "very much. The total score ranged from 40 to 160 (the lowest possible anxiety) (the highest possible anxiety) respectively and was categorized as:

Level of anxiety	Score
Mild anxiety	40–79
Moderate anxiety.	80–119
Severe anxiety.	120–160

Tool (IV). The Arabic version of the Pittsburgh Sleep Quality Index (PSQI-A), which was adapted from **Suleiman et al. (2010),** it is a self-rated questionnaire which assesses sleep quality and disturbances over a 1-month time interval, consists of 19 items. Four of the items demand a numerical response, while the most of the items are scored on a 4-point scale. The results are calculated according to a specific scoring key as seven component scores: subjective sleep quality, sleep latency, sleep duration, sleep efficiency, daytime dysfunction, sleep disturbances, and use of sleeping medications. The total score ranges from 0 to 21; higher scores indicate poor sleep quality (**Jerković et al. 2022**).

Sleep quality	Score
Good	0-12
Poor	≥ 13

Method of data collection

• An official approval was delivered from the Faculty of Nursing, Minia University and forwarded to director of Minia University Hospital and the director of outpatient clinics to get the approval to carry out the study after clarification of the purpose of the study.

- After describing the study's purpose, the patient oral consent to participate in the study.
- Patients were knowledgeable that their contribution is voluntary and they have the right to be quiet from the study.
- Tool I which established by the researchers based on systematic review of relevant literature; for tool II, III, IV these tools were tested for content validity by 7 experts in the disciplines of (Geriatric Nursing, Medical Surgical Nursing and Community Health Nursing). The necessary modifications and errors of some details were done and then established the final fieldwork schedule.
- The reliability of tool II (Numerical scale of pain) was 0.893, while reliability of tool III& IV (STAI & sleep quality scale) were 0.912, 0.873 respectively were tested on 10 of patients with abdomen surgery in order to measure the internal consistency of these tools by Cornbrash's alpha test.

A pilot study:
A pilot study was conducted on eight patients to evaluate the tools' usability and clarity as well as determine how much time would be required to complete the sheet. The patients from the pilot study were enrolled in the main study group.

Field of the work
- Data collected from March 2022 to August 2022, a six-month period, was used to conduct this study. The researchers visited the hospital's surgical ward from 8 a.m. to 1 p.m. on Saturday and Wednesday.
- The study acupressure and control groups were formed by randomly dividing the study patients into two equal groups. The experimental group received acupressure in five points and at any position for two minutes, twice daily for three days, whereas the control group received the same pressure at false points and false technique.

The present study was conducted in four phases:
   1. **Preparatory Phase:**
   To create the data collection tool, it involved Acupressure points were chosen as the most effective acupressure points for pain, anxiety and sleep quality after researching the pertinent literature and gaining theoretical understanding of numerous study-related topics from books, papers, and periodicals to determine the best acupressure sites for the parameters (pain, anxiety and sleep quality). It was available at https://www.acusansthan-ald.in/one-point.

   The researcher produced instructional video to help patients practice self-acupressure at home. It provided guide on an explanation of acupressure and its effects, a technique for performing acupressure on oneself, safety advice, and images of the locations of the acupressure points.

   2. **Assessment phase:**
   - Patients with abdominal surgery who fulfilled the inclusion criteria were interviewed separately by the researchers in the surgery department using tools from I to IV in order to obtain the baseline data, assessment of pain level, anxiety and sleep quality (per-test). The interview took around 20-30 minutes, this according to the patient's level of understanding.
   - In this phase, the researchers interviewed each patient and explained the objective of the study, tools components, advantages of the program for collecting baseline data

   3. **Implementing phase:**
   - Before beginning the study, the researcher was took a training course by physical therapist to practice acupressure safely on patients

   For the acupressure group:
   - Based on the acupressure method at the previous study performed by **Sun et al., (2010)** the intervention consisted of bilateral pressure was applied on the back of the hand between the first and second metacarpal bones and almost along the radial bone and PC-6 point, also known as "neiguan" or "inner pass," which is located about three fingers below the inner wrist, for 8 to 20 minutes in 10-second pressure and 2-second pressure, immediately following the surgery and after completing recovery from anesthesia and stability of the vital signs within 3 to 6 hours after the operation. The time needed for every patient was 30-40 minutes (10 minutes for applying the intervention, which was done by the researcher), and 20-30 minutes for filling out the patient's questionnaire.
   - For the control group: applied pressure on false points

   4. **Evaluation phase:**
   A post-test (5 weeks post the application of the acupressure) using the same tools at surgical outpatients or through phone calls.

Ethical consideration
- The Nursing Faculty's Ethical Committee accepted the research idea.
- Anonymity and confidentiality were guaranteed.
- Subjects to the study had the right to refuse participation or leave the study at any time and without explanation.
- There is no risk to study subjects during the application of the research, and the study will

adhere to general ethical standards for clinical research.

- The privacy of study subjects was taken into consideration during data collection.
- Following an explanation of the study's nature, objectives and patients' oral agreement to participate in the study.

Results

Table (1). Shows that, 37.5 % of acupressure group aged 60 or more years old with mean age 60.88±7.02 and 30.0% of the control group were in group aged 60 or more years old with mean age 51.30±6.32. In relation to gender, three fifths (60%) of acupressure group and three quarters (75%) of the control group were males. Regarding to marital status, 62.5% and 75% of the studied patients in acupressure and control groups were married respectively, while, 75% and 57.5% of them were from urban. Half of the acupressure group (50%) had basic education compared to 47.5% in the control group. More than half of the studied patients were workers.

Table (2). Illustrates that, hypertension and diabetes were the most common chronic disease in 47.5% and 37.5% of acupressure and control groups respectively and more than half of both groups had past history of surgery. Cholecystectomy was the common surgical procedure in 30% of acupressure compared to 27.5% in the control group, regarding of hospital stay duration, Mean ± SD (3.31 ± 1.55 & 2.13± 1.85) days for acupressure and control groups respectively. Moreover, there were no statistically significant differences between both groups regarding their medical data.

Table (3). Points to no statistically significant difference between both groups regarding severity pain at pre intervention, while post intervention, there was a highly statistically significant difference between Acupressure and Control groups at (p- value = 0.001). 75.0% of the acupressure group had severe pain pre acupressure intervention compared to 30.0 % of them had severe pain post intervention. While, 75.0% and 52.5 % of the control group had severe pain pre and post intervention respectively.

Table (4). Shows that, no statistically significant difference between two groups regarding anxiety level at pre intervention, while post intervention, there was a highly statistically significant difference between Acupressure and Control groups at (p- value = 0.001). 65.0% of the Acupressure group had severe anxiety level pre acupressure intervention decreased to only 20.0% post intervention compared to 75.0% and 50.0% of the control group who had severe anxiety level pre and post intervention respectively.

Table (5). Indicates that, there no significant difference between both groups related to total sleep quality at pre-intervention (p>0.05). While, post Acupressure intervention improved total sleep quality among acupressure group compared to control group at <0.001.

Table (6): points to statistically significant positive correlations between total mean score of studied patient anxiety, pain level and their sleep quality.

Table (7) reveals that patients' age, occupation, previous surgery had statistically significant positive correlation with their score of pain. Regarding anxiety score, this score had statistically significant positive correlation with patient's educational level, month income. Moreover, patient's score of sleep quality, this score had statistically significant positive correlation with their age and chronic diseases.

Table (1): Distribution of socio-demographic characteristic of the study group

Items		(Acupressure) (n= 40)		(Control) (n= 40)	
		No.	%	No.	%
Age (in years)	30 - < 40	3	7.5	1	2.5
	40- < 50	11	27.5	10	25
	50 - <60	11	27.5	17	42.5
	60 or more	15	37.5	12	30
	Mean ± SD	60.88±7.02		51.30±6.32	
Gender	Male	24	60.0	30	75
	Female	16	40.0	10	25
Marital status	Single	5	12.5	6	15
	Married	25	62.5	30	75
	Divorced	5	12.5	2	5
	Widow	5	12.5	2	5
Residence	Urban	10	25	17	42.5
	Rural	30	75	23	57.5
Educational level	Illiterate	9	22.5	14	35
	Basic	20	50.0	19	47.5
	Secondary	6	15.0	5	12.5
	University	5	12.5	2	5
Occupation	Not work	5	17.5	7	17.5
	Worker	24	60.0	22	55
	Employee	6	15.0	5	12.5
	Retired	5	12.5	6	15

Table (2): Distribution of the studied patients regarding to their medical data.

Items		(Acupressure) (No.= 40)		(Control) (No.= 40)		P-Value
		No.	%	No.	%	
Chronic disease@	No	25	62.5	17	42.5	
	Hypertension	19	47.5	15	37.5	
	Diabetes	19	47.5	15	37.5	0.161
	Cardiac	4	10	7	17.5	
	Respiratory	1	2.5	1	2.5	
	Others	1	2.5	1	2.5	
Pervious surgeries	Yes	24	60	28	70	0.194
	No	16	40	12	30	
Current Patients' surgical procedure	• Appendectomy	10	25	9	22.5	
	• Cholecystectomy	12	30	11	27.5	
	• Spleenectomy	1	2.5	1	2.5	0.490
	• Intestinal obstruction	7	17.5	7	17.5	
	• Hernia	7	17.5	9	22.5	
	• Others	3	7.5	3	7.5	
Duration of hospital stay: (days)	1	9	22.5	14	35	
	2 -4	25	62.5	21	52.5	0.392
	≥ 5	6	15	5	12.5	
	Mean ± SD	3.31 ± 1.55		2.13± 1.85		

@More than one answer may be presented in the same patient   Not -significant (p>0.05)

Table (3): Comparison between acupressure and control groups regarding their pain severity pre and post acupressure intervention

Pain Severity	Pre- intervention					Post- intervention				
	Acupressure group (No.=40)		Control group (No.=40)		P- value	Acupressure group (No.=40)		Control group (No.=40)		P- value
	No.	%	No.	%		No.	%	No.	%	
Mild	2	5.0	4	10.0		12	30.0	4	10.0	0.001**
Moderate	8	20.0	6	15.0		16	40.0	15	37.5	
Severe	30	75.0	30	75.0	0.116	12	30.0	21	52.5	

** Highly significant (p<0.001)

Table (4). Comparison between acupressure and control groups regarding their anxiety level pre and post acupressure intervention.

Anxiety severity	Pre- intervention					Post- intervention				
	Acupressure group (No.=40)		Control group (No.=40)		P- value	Acupressure group (No.=40)		Control group (No.=40)		P- value
	No.	%	No.	%		No.	%	No.	%	
Mild	4	10.0	3	7.5		16	40.0	10	25.0	**0.001****
Moderate	10	25.0	7	17.5		16	40.0	10	25.0	
Severe	26	65.0	30	75.0	0.536	8	20.0	20	50.0	

** Highly significant (p<0.001)

Table (5). Comparison of Acupressure and control groups regarding their quality of sleep pre and post acupressure intervention.

Sleep quality	Pre- intervention					Post- intervention				
	Acupressure group (No.=40)		Control group (No.=40)		P- value	Acupressure group (No.=40)		Control group (No.=40)		P- value
	No.	%	No.	%		No.	%	No.	%	
Poor	32	80.0	33	82.5	> 0.05	12	30.0	23	57.5	0.001**
Good	8	20.0	7	17.5		28	70.0	17	42.5	

** Highly significant (p<0.001)

Table (6): Correlation matrix of **quality of sleep, anxiety and pain level**

Scores	Total Mean score		
	Pain level	**Anxiety level**	**Quality of sleep**
Pain level		.200**	.316*
Anxiety level	.435**		.662**
Quality of sleep	.725**	.077	

r (P) Pearson correlation test & P for r test   *(*) Statistically significant at p<0.05*

Table (7): Correlation matrixes of pain, anxiety, sleep quality and their characteristics

Baseline data	Spearman's rank correlation coefficient		
	Pain	**Anxiety**	**Sleep quality**
Age	.259**	-.219*	.254**
Educational level	.360	.252*	.015
Occupation	.167*	.171	-.204**
Monthly income	208	.242**.	.023
Having chronic disease [yes]	-.220*	-.197	.152*
Pervious surgery	.261**	.106	.143

(*) Statistically significant at (p<0.05)   (**) statistically significant at (p<0.01)

Discussion

In healing. Postoperative discomfort reduces the quality of patients' sleep and increases their financial burden by lengthening their hospital stays and postoperative recovery periods, which can lead to unfavorable outcomes (such as dread, worry and sleeplessness (**Kilinç & Özlü, 2022).**

Through the release of endorphins and serotonin from the stimulation of acupressure points, acupressure is a non-pharmacological method for reducing pain and regulating sleep. These chemicals produce a calming and stimulating response in the body, which lowers anxiety, promotes relaxation, and improves the quality of sleep. Acupressure stimulation is also thought to control the activity of the parasympathetic nervous system. Due to an increase in autonomous reactions and a decrease in psychological stress, this circumstance improves sleep quality (**Acar et al. 2017).** The aim of the study was to examine efficacy of acupressure on post-operative pain, anxiety level and sleep quality for abdominal surgical patients

Research Hypothesis: The acupressure technique will have positive effect on abdominal surgical patients by reducing their degree of pain severity supported with the result:

Regarding the degree of pain severity before and after the application of acupressure, the results of the current study indicated that there was a significant statistical difference between the groups after the application of acupressure. This result can be explained by the mechanism of acupressure action, which generates low-frequency electrical stimulation of the skin's sensory receptors and results in endorphin release from the hypothalamus. The current results are in accordance with **Shah et al. (2022) entitled** *"acupuncture and postoperative*

pain Reduction" showed that acupressure is an effective technique for reducing the level of post-operative pain among patients. Also, the results are agreed with **Shady et al. (2020)** who conducted study *entitled "effectiveness of acupressure in the reduction of pain and anxiety among patients with open thoracotomy"* who reported that there were statistical significant difference between the control group and the acupressure group regarding the level of pain. Likewise, the current finding was agreed with **Zhong et al. (2019)** in their systematic review and meta-analysis study *entitled "effectiveness of acupressure for Acute Postoperative Pain after Surgery"* who concluded that acupressure significantly improved the total effective rate of pain relief. Conversely, the present a result was inconsistent with **Kilinç and Özlü, (2022**) who performed study about "Effect of acupressure application on patients' nausea, vomiting, pain, and sleep quality after laparoscopic cholecystectomy' and reported that acupressure application had non-significant on patients' pain.

Concerning anxiety level**,** the results of the current study revealed that there was high statistically significant difference between both groups post intervention. This result might be due to through endorphins and serotonin which are released by stimulating acupressure points, and these substances create a calming and stimulating response in the body, thus providing relaxation and reducing the anxiety. Also, Acupressure was performed by researcher who explains and provides patients with necessary information to reduce anxiety in postoperative patients and improve their recovery and overall health**.**

The current result was in same line with study by **Abd Elgwad et al. (2022**) who conducted study about *"The effect of Acupressure on severity of pain and level of anxiety for patients post coronary artery bypass"* and reported that more than two thirds of the study group had severe anxiety level pre intervention decreased to only minority of them post intervention. While, the majority and about two thirds of the control group had sever anxiety level pre and post intervention respectively.

Moreover, the results agreed with **Shady et al. (2020)** who reported that, there was a statistically significant difference between the two groups regarding anxiety level at the post-intervention of acupressure.

▪ **Research Hypothesis:** The acupressure technique will have positive effect on abdominal surgical patients by enhancing their sleep quality

Related to the quality of sleep, the results of the current study showed that there was high statistically significant difference between both groups post acupressure intervention. This may be due to the effect of Acupressure to regulate the vital energy (known as Qi) and stimulation of acupoints which helps release muscle tension, promotes blood circulation, reduces anxiety, provides relaxation and thus, improves sleep quality.

The result of the present study supported by **Yun & Hyojun (2020)** who studied entitled "Effects of auricular acupressure on the quality of sleep and anxiety in patients undergoing cardiac surgery" and concluded that the reduced sleep quality scores of the experimental group were significantly compared to the control group. Also, **Song et al. (2021)** who conducted study entitled *"The efficacy of acupuncture in postoperative sleep quality"* and reported that there were high statistically significant differences between both groups post acupressure intervention.

The present study's findings demonstrated that, following an acupressure intervention, there were statistically significant favorable relationships between sleep quality and pain severity and anxiety levels in both the study and control groups.

This finding supported by **Dilek and Sevim (2019)**, in their study titled "Acupressure Effect on Anxiety and Sleep Quality after Surgery" who confirmed that there was statistically significant correlation between the quality of sleep and anxiety level among the patients in the intervention group.

The present study pointed there the statistically significant positive correlations between total mean score of anxiety, pain level and sleep quality. The finding was harmony with study by **Abd Elgwad et al. (2022)** who revealed that there were statistically significant relations between pain severity and anxiety level within the study and control groups post acupressure intervention. Also **Abd El-Monem, & Rady, (2020)** who conducted study entitled "*Effect of Acupressure technique on post-operative pain and quality of recovery among patients with abdominal surgeries"* supported the current results and reported that there were statistically significant relations between pain severity and anxiety level within the study and control groups. Moreover, this result was accordance with study by **Abd ElHafeez et al., (2022)** who performed study about " Sleep quality and anxiety among Egyptian population during covid-19 pandemic" and showed that studied patient who reported poor sleep quality had significantly greater levels of anxiety (p 0.001). Significant positive

correlation was found between the anxiety scale and the PSQI scale.

The current study demonstrated that patient's score of sleep quality, this score had statistically significant positive correlation with their age and chronic diseases. This finding was matched with study by **Singh et al. (2021)** entitled "Sleep quality index and factors influencing sleep of patients in tertiary care hospital" and revealed that there age and chronic diseases effect on sleep quality

Conclusion:
On the light on the finding of the current study, it can be concluded that:

Acupressure is a powerful intervention that helps people sleep better and with less pain and anxiety. Additionally, the outcomes highlight the effectiveness of acupressure; when acupressure was used, the study group's pain intensity and anxiety level significantly decreased and their quality of sleep significantly improved when compared to the control group, which support the research hypothesis.

Recommendation:

Based on the results of the present study the following recommendations are suggested:
- This study suggested adding acupressure to the usual primary care services offered to patients who had abdominal surgery.
- More research is needed to determine how acupressure helps surgical patients with various problems.
- It's also advised to replicate the study on a sizable sample in order to generalize the findings.

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