



The Effect of Acupressure on Anxiety Related to Chest Tube Removal in Patients with Thoracic Trauma

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Abstract

Introduction: Chest tube insertion emerged as a vital intervention for patients with thoracic trauma. This procedure often causes anxiety among patients. Non-pharmacological approaches like acupressure as potential treatments can be used for anxiety reduction. This study aimed to determine the effect of acupressure on alleviating anxiety during chest tube removal in patients with thoracic trauma.

Methods: In this quasi-experimental study, 204 patients from Zahedan were randomly divided into the intervention group (n=102) and the control group (n=102). The acupressure intervention was administered to patients in the intervention group. The anxiety levels were evaluated using the Pain Anxiety Symptom Scale both when the chest tube was inserted and when it was removed.

Results: The outcomes showed that the scores of Anxiety were a statistically significant difference in the mean total anxiety score after the intervention (P=0.0001).

Conclusion: The insertion and removal of a chest tube following trauma can induce anxiety in individuals. Considering the crucial role of nurses in patient care, non-pharmacological approaches like acupressure can be employed to alleviate anxiety. Acupressure is a low-cost, affordable, and readily available method that can effectively reduce anxiety levels in patients undergoing chest tube procedures.

Keywords: Acupressure, Anxiety, Chest Tube.

Introduction

Trauma refers to any intentional or unintentional act that causes injury or harm to the human body, either through penetration or non-penetration by external factors. Traumatized patients refer to individuals who are experiencing life-threatening conditions such as severe respiratory and cardiac disorders, cardiac and respiratory arrest, severe poisoning, open chest wounds, significant internal and external bleeding, and other critical medical emergencies^{1,2}.

Based on available statistics, trauma stands as one of the most significant contributors to disability in modern societies³. It is the leading cause of death among individuals under the age of 45 in the world⁴. In addition to its impact on mortality, trauma can result in various consequences. Thoracic trauma, specifically, can lead to injuries such as rib fractures, pneumothorax, tension pneumothorax, lung compression, and Hemo

Pneumo Thorax with lung compression. Surgical procedure and a chest tube insertion are required in approximately 17.6% of cases. Numerous studies have reported that around 90% of cases are managed through palliative treatments and chest tube insertion⁵.

While a chest tube insertion is crucial for patients⁶, it is essential to acknowledge that the surgical site in the chest can cause significant pain⁷. As a result, patients often experience heightened fear and anxiety when the chest tube is connected⁸. On the contrary, chest tubes are typically removed within 24 to 48 hours after surgery or once the excess air, blood, or fluid has been adequately drained⁹. However, it has been reported that the removal of chest tubes can be a distressing and painful procedure for patients¹⁰.

As mentioned earlier, the insertion and subsequent removal of a chest tube can induce anxiety in patients

^{11,12}. Anxiety poses a significant challenge as it indirectly contributes to increased postoperative pain, higher analgesic consumption, reduced resistance to infection, delayed wound healing, and prolonged hospital stay. Consequently, there is an increasing demand for safe interventions to effectively manage patient anxiety, such as complementary medicines ¹³.

Non-pharmacological approaches, such as acupressure, are used in the management of anxiety ¹⁴. Acupressure, derived from the Latin term meaning "sharp pressure," shares similarities with acupuncture, but there is a critical distinction in their applications. While acupuncture involves using specialized needles, acupressure involves applying pressure using hands, wooden objects, or plastic ¹⁵.

Acupressure involves the application of pressure using fingers or plastic beads to modulate the activity of the sympathetic and parasympathetic nervous systems, thereby promoting bodily function and enhancing comfort. However, the precise mechanism underlying the effects of acupressure is still not fully understood. The rationale behind acupuncture is to stimulate the body's self-regulation processes, which involve the release of neurochemicals, including serotonin, a mood-regulating neurotransmitter. This release of neurochemicals can help alleviate pain and emotional distress, including anxiety ¹⁶.

Acupressure, being non-invasive and cost-effective, requires no specialized equipment. In comparison to acupuncture, acupressure carries a lower risk of side effects. Nurses can easily acquire acupressure skills and incorporate them into their clinical practice to enhance patient comfort and alleviate discomfort ¹⁷. In acupressure, nurses facilitate, support, and promote optimal patient care. They must take necessary measures when the safety and well-being of patients are at risk. This includes communicating concerns and collaborating with the healthcare team. Nurses should also advocate for policies and procedures related to complementary medicines that prioritize patient safety ¹³. However, available evidence regarding the effect of acupressure on psychosocial aspects of health is limited ¹⁷.

Regarding the limited resources available on this topic, the present study aimed to examine the impact of acupressure on anxiety levels related to chest tube removal in patients with thoracic trauma.

Methods

Design

The study was quasi-experimental method. The population study was all patients with chest tubes following thoracic trauma in Zahedan from January 2023 to December 2023.

Sample and setting

This study was conducted in the inpatient and surgical departments of Khatam and Ali ibn Abitalib hospitals in Zahedan. Based on Bastani et al.'s study (2013) ¹⁸, each group's sample size was 102 individuals, with a 95% confidence interval and 95% test power. The study included 204 participants, selected conveniently and then randomly assigned to either the intervention or control group using a random number table.

Participants aged 18-56 years who met the following criteria were included in the study: They had a chest tube, possessed a clear understanding of their surroundings and the current time, had not taken analgesics or narcotics within four hours prior to the intervention, did not have any hearing or vision impairments or any other obstacles to education, had no history of addiction or consumption of anxiolytic drugs, had no prior experience with chest tube connection, and did not exhibit excessive anxiety that necessitated immediate medical intervention. The exclusion criteria were unwillingness to participate in the study, severe anxiety caused by environmental factors, and transfer to intensive care units (ICU).

Data collection

The data collection tools used in this study included a demographic information questionnaire and the Pain Anxiety Symptom Scale (PASS).

The demographic information questionnaire included questions to measure age, gender, education level, and marital status, which both intervention and control groups completed before the intervention.

The Pain Anxiety Symptom Scale Short Form (PASS-20) is a questionnaire commonly used to measure anxiety related to pain. It assesses avoidance and fear behaviors that individuals may experience about pain. The Pain Anxiety Symptom Scale (PASS) is a questionnaire designed by McCracken and Dhingra in 2002 to assess pain anxiety symptoms. In Iran, Ghazaei et al. validated the questionnaire in 2018. The PASS consists of 20 questions and four subscales: cognitive, escape/avoidance, fear, and physiological anxiety.

Participants rated their responses on a five-point Likert scale. The total score on the questionnaire ranges from 0 to 80, with higher scores indicating higher levels of pain anxiety symptoms. Ghazaei et al. (2018) evaluated the content, face, and criteria validity of the PASS. Additionally, they calculated Cronbach's alpha coefficient to be above 0.7¹⁹.

After receiving approval from the ethics committee of Zahedan University of Medical Sciences and obtaining the necessary permissions, the researchers explained the study to the potential participants. Those who wanted to participate were asked to provide written consent and complete the demographic information questionnaire. Following the participants' chest tube surgery and subsequent transfer to the ward, their levels of anxiety were measured using the Pain Anxiety Symptom Scale (PASS).

In collaboration with a general surgery specialist, the researcher applied acupressure to specific points in patients who underwent chest tube insertion. Before the intervention, the patient's anxiety levels were measured. During the intervention, acupressure was performed on both the intervention and control groups. In the intervention group, the researcher placed a plastic bead on the Shenmen point of the non-dominant ear and applied pressure using their fingers for 10 minutes. Additionally, circular pressure was applied to the third eye point using the researcher's thumb, with an average of 20-25 circular movements per minute for another 10 minutes, as Figure 1 shows.

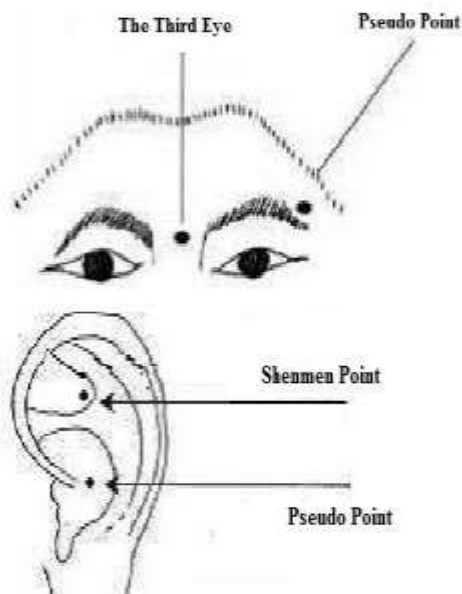


Figure 1: Shenmen point used for intervention.

This intervention was conducted on the first and second days following the chest tube insertion, as the typical duration for the tube to remain in place ranges from 24 to 48 hours. The patients were also educated on performing acupressure at the designated points. Lastly, before removing the chest tube, acupressure was administered, and the patient's anxiety levels were measured once again.

In the control group, participants received acupressure on Sham points, which are known to be ineffective in the philosophy of acupressure and do not have any relaxing or therapeutic effects. The specific Sham points utilized in this study were the outer corner of the left eyebrow and the entrance to the ear cavity, both on the non-dominant side. The control group did not receive any specific acupressure treatment. Instead, they received routine care, including assessing secretion levels, caring for the surgical site and dressing, and receiving a spirometer. The participants were instructed to use the spirometer but were not supervised during its use. Anxiety levels were measured and recorded at two different stages for the control group. The first measurement was taken at the time of chest tube removal, and anxiety was assessed using the Pain Anxiety Symptom Scale (PASS).

Data Analysis

The collected data were analyzed using ANCOVA test and chi-square tests with SPSS-26. A P-value less than 0.05 was considered significant.

Results

The mean ages of participants in the intervention and control groups were 35.36 ± 11.3 and 37.57 ± 12.03 years, respectively. Table 1 presents demographic information of the participants. The results indicated no statistically significant difference in variables such as sex, age, education level, and marital status between the intervention and control groups before the intervention. Table 2 shows the difference between the mean of the groups' anxiety in the pre-test and post-test.

According to the results, after the intervention, there was a significant decrease in the mean anxiety score in the intervention group, but a significant increase in the mean anxiety score in the control group.

The outcomes showed that the anxiety scores were statistically significant in the mean total anxiety score after the intervention ($P=0.0001$) (Table 2).

Table 1: Individual characteristics of the participants.

Variable	Group	Intervention	Control	Total	P
		Number (percentage)	Number (percentage)		
Gender	Men	62(30/4)	53(26/0)	115(56/4)	0/2
	Female	40(19/6)	49(24/0)	89(43/6)	
Level of education	Illiterate	11(5/4)	10(4/9)	21(10/3)	0/96
	Elementary	34(16/7)	39(19/1)	73(35/8)	
	Diploma	33(16/2)	32(15/7)	65(31/9)	
	Bachelor's degree	18(8/8)	16(7/8)	34(16/7)	
	Master's degree	6(2/9)	5(2/5)	11(5/4)	
Marital status	Single	60(29/4)	55(27/0)	115(56/4)	
	Married	42(20/6)	47(23/0)	89(43/6)	
Average age (years)		11/3 ± 35/36	12/03 ± 37/57	11/70 ± 36/47	

Table 2: Value of the variables in pre-test and post-test.

variable	Groups	Pre-test	Post-test	F	Sign.	Eta square
		Mean ± SD	Mean ± SD			
Anxiety	Experimental Group	67/84 ± 3/65	43.90 ± 5.18	1468.125	.000	.880
	Control Group	68/22 ± 5/91	70.05 ± 4.57			

Discussion

The study results demonstrated that acupressure effectively reduced anxiety levels in trauma patients with chest tubes. These results were confirmed by Hyojeong et al.'s study (2014), which investigated the impact of acupressure on anxiety levels in patients before surgery²⁰.

Moradi et al. (2015) investigated the effect of acupressure on the anxiety level of patients undergoing hemodialysis. They showed that acupressure applied on specific acupoints could reduce both state and trait anxiety in hemodialysis patients²¹. These findings confirm the results of the present study, although the current study had a larger sample size. It is important to note that while Moradi's study focused on patients with chronic diseases undergoing hemodialysis, the present study examined trauma patients who were experiencing acute and sudden conditions.

The findings of Bassampour et al. (2008) further supported our results and demonstrated the effect of acupressure on reducing anxiety levels in patients undergoing abdominal surgery²². Since chest tube insertion is considered a surgical procedure, this supports the effect of acupressure in surgical settings. Additionally, Islam Sabry Abd et al. (2022) identified the positive effects of acupressure on both pain intensity

and anxiety levels in patients after coronary artery bypass surgery¹³. Although their study focused on patients undergoing surgery, it is worth noting that the present study assessed pain using the PASS scale. In contrast, Islam Sabry Abd used the State-Trait Anxiety Inventory to measure anxiety levels.

Bastani et al. (2016) compared the effects of acupressure and cold therapy on the pain of chest tube removal in older people who underwent open heart surgery. They showed that acupressure effectively reduced the pain intensity caused by the chest tube removal²³. These findings confirm the results of the present study, as pain control can positively contribute to the management of a patient's anxiety and vice versa. In addition, Thin Hmwe et al. (2014) investigated the effects of acupressure on reducing anxiety, stress, and depression in patients undergoing hemodialysis three times a week for four weeks. The measurements were done using the DASS21 scale¹⁷.

Valiee et al. (2010) evaluated the synergistic effect of acupoints on reducing the anxiety of patients before abdominal surgery. The intervention group received acupressure on the third eye and Shenmen points (correct points), while the control group received acupressure on Sham points. The findings of the study demonstrated that acupressure applied to the correct

points effectively reduced preoperative anxiety in patients undergoing abdominal surgery²⁴. These results align with the findings of the present study.

In a study conducted by Mora et al. (2007), acupressure was shown to effectively reduce anxiety levels in older patients who required ambulance transport to the hospital²⁵. Although the target group and the methodology used to measure anxiety differed from the present study, their findings are consistent with the results of our study, suggesting that acupressure is an ideal intervention for reducing anxiety in emergency settings such as ambulances. Acupressure proves to be an attractive intervention option as it requires minimal equipment, can be easily implemented with simple and short training, and can be performed by healthcare professionals such as doctors, nurses, paramedics, or emergency medical technicians at the scene without the need for complex equipment or additional assistance. Therefore, acupressure not only proves to be effective in treating anxiety but also has the potential to reduce overall healthcare costs by minimizing the complications associated with traumatic stress. It is important to note that the applicability of acupressure is limited to stable patients without significant trauma or illness²⁶.

Among the limitations of the present study, it is essential to acknowledge that some patients may have used drugs or narcotics despite being advised against them by nurses and doctors. Additionally, despite the researchers' efforts, the non-cooperation of specific patients in stressful situations was another factor beyond the study's control.

Conclusion

The study results highlight the effectiveness of acupressure in reducing anxiety related to chest tube removal in trauma patients. This study holds particular significance in countries like Austria and Iran, where only physicians are allowed to prescribe anxiety-reducing drugs. However, acupressure, being an easy-to-learn technique, can be performed by paramedics (30) and presents a low-cost and practical approach to alleviating patients' anxiety.

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Conflict of Interest Disclosures

The authors declared no conflict of interest.

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None.

Authors' Contributions

Not cleared.

Ethical Statement

The present article is part of a research project. This study was approved by the ethics committee at Zahedan University of Medical Science (IR.ZAUMS.REC.1402.182). The participants' autonomy, independence, confidentiality, and privacy were considered. Participants were informed about the study. The written and oral informed consent was obtained to take notes or record their audio. The participants were free to exit the study whenever they wanted.

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