

# Effect of P6 Point Acupressure on Anxiety Caused by Venipuncture in Patients with Thalassemia: A Clinical Trial Study

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## ABSTRACT

**Aims** Anxiety caused by repeated venipuncture is common in patients with thalassemia in the thalassemia ward. Acupressure is one of the methods used to reduce patients' anxiety. This study aimed to determine the effect of the P6 point acupressure on anxiety caused by venipuncture in thalassemia patients.

**Materials & Methods** This randomized controlled clinical trial was conducted on 80 patients with thalassemia at Shahid Beheshti Hospital in Yasuj city in 2019, who were divided into two intervention and control groups by blocked random allocation. Acupressure intervention was performed at P6 point on the inner side of the arm and in the cavity between the bones of the forearm, above the crease of the wrist. The Spielberger State-Trait Anxiety Inventory was used to collect information. Data were analyzed using descriptive and inferential statistics (independent t-test, paired t-test, and chi-square test) through SPSS 21 software.

**Findings** There was no significant difference in the state and trait anxiety between the intervention and control groups at the beginning of the study ( $p>0.05$ ). However, a significant difference was observed in the state anxiety between the intervention and control groups after the intervention ( $p<0.05$ ), but there was no significant difference in the trait anxiety score between the two groups ( $p>0.05$ ).

**Conclusion** Acupressure reduces trait anxiety caused by venipuncture in thalassemia patients hospitalized to the thalassemia ward, while it does not affect their trait anxiety.

**Keywords** Acupressure; Anxiety; Venipuncture; Thalassemia

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## Introduction

Thalassemia is an autosomal recessive congenital disease and a type of hereditary hemoglobinopathy caused by defects in the production of globin chains. These patients need continuous blood transfusion and chelation to survive. Although this disease has become a chronic disease, it is still one of the most common genetic diseases in Iran and the world. There are approximately 300 million patients worldwide; On the other hand, Iran is one of the thalassemia belt countries, with about 20,000 thalassemia patients and 3 million thalassemia carriers [1].

There is a need for venipuncture as part of the main treatment in thalassemia patients. Venipuncture is a common invasive procedure for delivering blood, fluids, and electrolytes. This procedure is a painful and unpleasant experience for patients, especially for children. Also, venipuncture is used as part of permanent treatment in some patients such as thalassemia [2, 3]. Many diagnostic and therapeutic procedures such as surgery, anesthesia, dressing change, and injections are associated with the experience of pain and anxiety [4].

Anxiety is a psychological state experienced by all people throughout their lives, when anxiety exceeds its normal level and causes distress, they consider it as a disorder [5]. Anxiety is a negative emotional state with feelings of anger, discomfort, and confusion that are associated with physical activity or arousal [6]. According to the definition of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), anxiety is an emotional response against a real or imaginary threat in the future, which is different from fear [7]. Anxiety is a distressing state of mind, also characteristic of a group of disorders that can be diagnosed by health care professionals [8].

There are different pharmacological and non-pharmacological methods to control pain and anxiety [9]. Acupressure is one of the non-drug and cost-effective methods [10]. Although acupressure is one of the alternative medical methods, the exact mechanism of the effect of this method has not been determined [11]. Acupressure is a non-invasive procedure that can be used by clinical staff and patients [10-14].

Acupressure is based on the theory of fourteen meridians in China. These fourteen meridians contain the same channels of vital energy. Imbalance in these channels is associated with a series of symptoms [15]. Certain points in the body are known as pressure points. Applying pressure to these points leads to the elimination of vital energy imbalance in the body. In this way, the pain and symptoms of anxiety are reduced for about 30 seconds to 30 minutes after applying pressure to the place. Some mental illnesses such as depression and anxiety can be treated by pressing the P6 point,

which is located four fingers above the inner ankle behind the posterior edge of the tibia, and also by pressing the LI4 point, which is located on the back of the hand between the first and second metacarpal bones and next to the base of the second metacarpal [10-14]. The P6 point is one of the points used in acupressure; this point is located on the inner side of the arm and inside a cavity between the bones of the forearm, three fingers width above the fold of the wrist. This point is used in acupuncture to treat vomiting. It is also used in acupressure to treat anxiety and the resulting physiological complications [16-18].

The results of Shahdadi *et al.*'s study showed that the use of acupressure method to control anxiety has a positive and significant effect [19]. The results of Avisa *et al.*'s study showed that the use of acupressure during tooth restoration reduces children's anxiety [20].

Acupressure is an uncomplicated and cost-effective way to treat anxiety disorders [21]. So far, there has been no study that has investigated the effect of acupressure to treat anxiety caused by venipuncture in thalassemia patients. This study aimed to determine the effect of the P6 point acupressure on anxiety caused by venous venipuncture in thalassemia patients hospitalized in the thalassemia ward.

## Materials and Methods

The current research is a randomized clinical trial with a control group and pre-test and post-test measurements. The research population consisted of thalassemia patients hospitalized in the thalassemia department of Shahid Beheshti Hospital in Yasuj city in Iran in 2019. The sample size was calculated using the results of Masoudi Alavi *et al.*'s study and according to the criteria:  $s_1=2$ ,  $s_2=2$ ,  $\mu_1=5$ ,  $\mu_2=3$ ,  $\alpha=0.05$  (CI=%95),  $\beta=20\%$  and power= 80% [11]. The number of samples calculated for each of the intervention and control groups was 39.31 people, and finally, considering the level of attrition, 40 people were included in each of the intervention and control groups (a total of 80 people). The participants were selected using purposive sampling method. They were divided into two intervention and control groups using blocked random allocation through sample randomizer software.

The inclusion criteria for the study included obtaining an anxiety score of less than 43 in the questionnaire, hospitalization, the ability to communicate, the ability to answer questions, and having informed consent to enter the study. The exclusion criteria included the patient's lack of consent to continue participating in the study, unsuccessful venipuncture or the need for re-venipuncture, receiving painkillers 3 hours before or during the study, receiving another painful intervention at the same time as the insertion of the

angiocath, and taking sleeping pills, anti-anxiety or anti-depressants before the intervention.

Demographic information was collected through a form. The Spielberger State-Trait Anxiety Inventory (STAI) was used to evaluate the anxiety levels. This questionnaire consists of 40 questions; the first 20 questions are related to measuring the state of anxiety and the second 20 questions are related to measuring the trait of anxiety. The scale of the state of anxiety (obvious anxiety) consists of 20 sentences that evaluate the feelings of the person in "this moment and time of response". The anxiety trait scale (hidden anxiety) also includes 20 sentences that measure people's general and ordinary feelings. A 5-point Likert scale is used for scoring, which includes "very little" = 1, "little" = 2, "a lot" = 3, and "very much" = 4. The scoring weights are reversed for statements that indicate a lack of anxiety. The scores of each of the two scales of state and trait of anxiety are in the range between 20 and 80. Scores between 20 and 29 indicate mild anxiety, scores between 30 and 49 indicate relatively mild anxiety, scores between 50 and 69 indicate relatively severe anxiety and scores between 70 and 80 indicate severe anxiety. The overall score of the questionnaire is between 40 and 160 [19, 22, 23]. Spielberger *et al.* reported in 1971 that the Cronbach's alpha coefficient was 0.92 for the state anxiety subscale and 0.90 for the trait anxiety subscale [24]. In Iran, Khanipour *et al.* confirmed the validity and reliability of the questionnaire [23].

The main intervention in the study was acupressure. P6 point was used to perform acupressure. The P6 point is located on the inner side of the arm and in the cavity between the bones of the forearm, three fingers' width above the crease of the wrist (Figure 1) [19].



**Figure 1.** Anatomical point P6 of acupressure

During the intervention, pressure of 3 to 5 kg was applied bilaterally in both hands to the mentioned point. Pressure was applied circularly and twice per second for three minutes with the thumb (three minutes at each point and two minutes of rest) so that the patient felt tingling and mild numbness in his/her hand [19]. The intervention was carried out

by a researcher who had received acupressure training from the Iranian Acupuncture Association. Following the standard guidelines, an angiocath (pink color and size 20) was inserted by a researcher for all patients. In the control group, angiocath was inserted according to the routine and standards.

Data were collected through a questionnaire before and 30 minutes after the intervention.

Data distribution was checked using the Kolmogorov-Smirnov test. For data analysis, descriptive statistics and inferential statistics tests (independent t-test, paired t-test, and chi-square test) were used through SPSS 21 software.

## Findings

The mean age of the participants was  $24.13 \pm 7.17$  years. 31 participants (38.8%) were male and 49 participants (61.2%) participants were female. There was no significant difference between the two groups in terms of age, gender, education level, and employment status before the intervention ( $p > 0.05$ ; Table 1).

**Table1)** Comparison of demographic variables of thalassemia patients in two intervention (n=40) and control (n=40) groups

Patients in two intervention (n=40) and control (n=40) groups			
Variables	Intervention group, No. (%)	Control group, No. (%)	P-value*
<b>Gender</b>			
Male	12 (30.0)	19 (47.5)	0.11
Female	28 (70.0)	21 (52.5)	
<b>Education level</b>			
High school	15 (37.5)	23 (57.5)	0.13
Diploma	17 (42.5)	9 (22.5)	
A.D.	8 (20.0)	8 (20.0)	
<b>Job status</b>			
Unemployed	27 (67.5)	23 (57.5)	0.61
Employed	3 (7.5)	5 (12.5)	
Studying	10 (25.0)	12 (30.0)	

\*Chi-square test

The mean scores of state anxiety and trait anxiety in all participants before the intervention were  $38.86 \pm 10.52$  and  $41.36 \pm 12.01$ , respectively. Before the intervention, there was no significant difference between the two intervention and control groups in terms of trait anxiety score and state anxiety caused by venipuncture ( $p > 0.05$ ). After the completion of the research intervention, there was no significant difference between the two groups in terms of trait anxiety score ( $p > 0.05$ ). However, the state anxiety caused by venipuncture was significantly less in the intervention group compared to the control group ( $p = 0.005$ ; Table 2).

In the intra-group comparison of trait anxiety in both intervention and control groups, no significant difference was observed 30 minutes after the intervention ( $p > 0.05$ ). But in the intervention group, there was a significant difference in terms of state

anxiety score caused by venipuncture 30 minutes after the intervention compared to before the intervention ( $p=0.001$ ). However, the changes in the control group were not significant (Table 2).

**Table 2)** Comparison of the mean scores of trait and state anxiety in hospitalized thalassemia patients, before and 30 minutes after the intervention in the intervention and control groups

Research Time	Intervention Group	Control Group	P-value* (Intergroup comparison)
<b>Trait anxiety</b>			
Before	43.25±11.65	39.48±12.22	0.16
30 minutes after intervention	43.58±13.19	39.33±12.53	0.14
P-value** (Intragroup comparison)	0.79	0.86	-
<b>State anxiety</b>			
Before	39.93±10.49	37.80±10.56	0.37
30 minutes after intervention	32.50±6.95	39.15±12.93	0.005
P-value** (Intragroup comparison)	0.001	0.27	-

\*Independent sample t-test for between comparisons; \*\*Pair t-test for within comparison

## Discussion

This study was conducted with the aim of determining the effect of P6 point acupressure on the level of anxiety caused by venipuncture in thalassemia patients. Our study is innovative because no study has investigated the effect of P6 point acupressure on the level of anxiety caused by venipuncture in thalassemia patients. The results of this study showed that acupressure intervention affected reducing the level of state anxiety caused by venipuncture in patients with thalassemia, while it did not affect the trait anxiety of these patients.

Similar to the results of the present study, the results of Joseph *et al.*'s study showed that P6 point acupressure affects reducing students' anxiety [25]. Moreover, the results of Hmwe *et al.*'s study showed that acupressure has an effect on reducing the anxiety of dialysis patients [26]. Also, in line with the results of the present study, Avisa *et al.*'s study showed that acupressure reduces the anxiety of children undergoing dental restoration treatment [20]. Based on the results of Siasari *et al.*'s study, acupressure improved the anxiety and depression of dialysis patients [27]. Although sample size, type of disease, points used to apply pressure, the duration of applying pressure in acupressure, questionnaires, and the time to assess anxiety are different in the above studies, however, in these studies people's anxiety decreased, but state and trait anxiety of the patients has not been reported.

The findings of our study are reasonable and justifiable based on theoretical knowledge in the field of the positive effects of acupressure on reducing the anxiety of thalassemia patients hospitalized in the thalassemia ward. Since it corrects vital energy imbalances in the body,

applying pressure to these points also reveals positive effects within 30 seconds to 30 minutes after applying pressure to the place [25, 26]. Increasing endorphin secretion as a result of pressure point massage is one of the main mechanisms of acupressure in reducing patients' anxiety [28]. Based on medical theories, acupressure can reduce anxiety and depression by regulating the concentration of neurotransmitters, reducing adrenocorticotrophic hormones 2 and hydroxytryptamine 1 in neural pathways and improving relaxation [29].

According to the results of a review study, out of 27 clinical trial studies, acupressure had an adverse effect on patients' anxiety levels in only 2 studies, while it reduced anxiety in other studies [30]. Contrary to the results of the above studies, the results of the study by Kafaei Atrian *et al.* showed that acupressure on the third liver point reduces the overt anxiety of dysmenorrhoea patients, while this treatment did not affect the hidden anxiety of patients [31]. The result of the above study is similar to the results of the present study, which state or overt anxiety decreased, but trait or covert anxiety did not improve. It is also expected that state anxiety will improve in this type of intervention. Especially in the case of venipuncture, there is a need to improve state anxiety and there is no need to reduce trait anxiety. To reduce trait anxiety, it may be necessary to use more acupressure interventions or use other psychological interventions.

The strength aspects of this study include the positive effects of acupressure therapy in reducing anxiety caused by venipuncture in hospitalized thalassemia patients, as well as investigating trait anxiety and state anxiety separately, although our study had limitations. One of our limitations was not having acupressure at the placebo point for the control group and thus not blinding the intervention to the participants. Another limitation of this research was the possible reactions of people after knowing their level of anxiety at the beginning of the study and the involuntary desire of people to show their condition better.

It is suggested to use placebo in the pressure point control group in the future studies. We also suggest investigating the use of acupressure on other pressure points to reduce anxiety.

## Conclusion

Acupressure reduces trait anxiety caused by venipuncture in thalassemia patients hospitalized to the thalassemia ward, while it does not affect their trait anxiety.

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**Ethical considerations:** All participants were assured that their information would be kept confidential, and informed consent was obtained from them at the time of starting the study. This study has the ethics code number

IR.YUMS.REC.1398.148 from Yasuj University of Medical Sciences in Iran; also, this study has been registered in the clinical trial system of Iran with the number IRCT20200109046066N1.

**Conflict of interest:** The authors had no conflict of interest in this study.

**Author's Contribution:** Avini S. (First author), Original researcher/ Introduction author/ Discussion author (35%); Hosseini M. (Second author), Introduction author/ Assistant/ Discussion author (15%); Behnammoghadam M. (Third author), Assistant/ Methodologist/ Introduction author/ Discussion author (15%); Zoladl M. (Fourth author), Assistant/ Methodologist/ Statistical analyst (35%)

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