The Effect of Acupressure on Anxiety and Pain Among Patients Undergoing Coronary Angiography

A Randomized Controlled Trial

■ *Emine Derya Ister, PhD* ■ *Yasemin Altinbaş, PhD*

The aim of this study was to evaluate the effect of acupressure on anxiety and pain of patients undergoing coronary angiography procedures. This study was conducted in a cardiology clinic of the training and research hospital in of a province of southeast Turkey. A randomized control group design was used. Eighty patients who were undergoing coronary angiography were randomly enrolled in intervention and control groups. The intervention protocol included 11 minutes of acupressure that applied to Hegu, Shenmen, and Yintang acupoints. No intervention was applied to the control group. Spielberger's state-trait anxiety inventory and the visual analog scale were used as data-collecting tools. Data were analyzed using *t* test in independent groups and χ^2 test. The mean score of state anxiety of the intervention group was 41.50 ± 3.88, and was statistically significantly lower than the score of the control group after acupressure ($P = .000$). VASP2 and VASP3 pain intensity of the intervention group was statistically significantly lower than that of the control group after the coronary angiography procedure ($P = .000$). Acupressure is an effective technique for reducing the pain severity and anxiety among patients undergoing coronary angiography. **KEY WORDS:** *acupressure*, *anxiety*, *coronary angiography*, *pain*

Holist Nurs Pract 2022;36(6):E57–E63

INTRODUCTION

Cardiovascular diseases (CADs) constitute an important part of the causes of death worldwide. The World Health Organization reported that 17.9 million people died in 2019 and, CAD constituted 32% of all global death.[1] Cardiovascular disease was a common cause of death in Turkey in 2017, according to the Turkish Statistical Institute.[2] Coronary angiography (CA) is radiographic imaging of the coronary vessels following radiopaque contrast agent injection.[3] Coronary angiography is performed to exclude or confirm the diagnosis of coronary artery disease, to evaluate the prognosis and to choose the optimal medical or interventional therapy, and to investigate the changes that occur after interventional or pharmacological treatment.[4] Patients scheduled for CA experience anxiety and fear.[5] Planning CA intervention may increase anxiety due to pain during the intervention, fear of the unknown related to the procedure. The procedure is also stressful because of its association with heart disease.[6] Anxiety can be defined as an emotional response to a threat or danger.[7] Studies conducted to determine the anxiety level before CA show that the majority of patients who are scheduled for CA experience fear and anxiety concerning the procedure or the possibility of CAD diagnosis as a result of the procedure.[5,8,9] Delewi

Author Affiliations: Department of Nursing, Faculty of Health Science, Kahramanmaraş Sütçü İmam University, Kahramanmaraş, Turkey (Dr Ister); and Department of Nursing, Faculty of Health Sciences, Adıyaman University, Adıyaman, Turkey (Dr Altinbaş).

This study was performed at the Adıyaman Üniversitesi Eğitim ve Araştırma Hastanesi, Adıyaman, Turkey.

The submission has not been previously published. All authors approved the version to be published.

Study design, data collection, and manuscript preparation were performed by E.D.I. and Y.A.

The authors agree to the accuracy of the aforementioned information.

The authors have disclosed that they have no significant relationships with, or financial interest in, any commercial companies pertaining to this article.

Correspondence: Yasemin Altinbaş, PhD, Department of Nursing, Faculty of Health Sciences, Adıyaman University, Altınşehir Mah, Atatürk Blv No. 1, 02040 Merkez, Adıyaman, Turkey (yaseminaltinbas_27@hotmail.com).

DOI: 10.1097/HNP.0000000000000553

et al[10] emphasized that the anxiety levels of patients were high before the CA procedure. Anxiety experienced by patients before or after the cardiovascular intervention may cause an increase in the oxygen requirement of the myocardial layer. This can cause irregular heart rates and pain. Anxiety during cardiac catheterization can affect recovery and may cause physiologic complications.[11] Pain is an important complaint reported by patients undergoing cardiac catheterization.[12] Pain is a sensory and emotional experience that may occur after many invasive procedures, and severe tissue and psychological damage may be associated with pain.[13]

Recently, the focus has been on complementary and supportive therapies to provide symptom management in pain and anxiety. Acupressure is a massage technique that has been known since ancient times and is especially used for symptom management. Acupressure is accepted as a complementary and supportive medicine method by the World Health Organization.[14] At the same time, acupressure is a safe application and has advantages in that it does not require special equipment and is cost effective for the patient.[15] The acupressure application aims to facilitate and provide the healthy flow of Chi, which is the life energy, through the meridians, which are thought to carry the energy in the body.[14,16] However, there is limited information about the effectiveness of acupressure in clinical practice for reducing pain and anxiety undergoing CA procedure.

METHODS

Aim and hypotheses

This study aimed to evaluate the effect of acupressure applied to LI4 (Hegu), HT7 (Shenmen), and Extra 1 (Yintang) acupoints on anxiety and pain of patients undergoing CA procedure.

H1: Acupressure is effective in reducing the anxiety level of patients undergoing CA procedure.
H2: Acupressure is effective in reducing the pain intensity of patients undergoing CA procedure.

Setting and design

The study was conducted at a cardiology clinic of a training and research hospital at the province southeast of Turkey between June and November 2018.

This study was conducted using a randomized controlled experimental research model.

Population and sample

The population of the study comprised 184 patients who were scheduled for CA between June and November 2018, and the patients were evaluated according to the research criteria. The inclusion criteria for the study were to have the CA procedure for the first time, to have a planned CA procedure, to have no communication problems, and to be willing to participate in the study. Exclusion criteria were psychological or mental disorders, limb amputation, and having undergone interventions such as massage and acupuncture within the last month. In the clinic where the study was conducted, there was a registry where the records of the patients scheduled for CA are kept. However, there was no data in the list regarding the CA procedure history of the patients. Therefore, 184 patients scheduled for CA within the specified date range were screened for inclusion and exclusion criteria. As a result of the screening, 86 patients who met the research criteria were identified. Six patients did not want to participate in the study and 80 patients were divided into intervention and control groups by simple randomization method. The first patient hospitalized at the beginning of the study was included in the experimental group, the next patient was included in the control group, and the randomization was done one-on-one. Forty patients were selected as the intervention group and 40 patients as the control group. The study was completed with 80 patients. According to the *t* test performed on independent groups, the power of the study was determined as 91% with an effect size of 0.5 and an error level of 0.05 for the research sample.[17] The consort diagram is shown in Figure 1.

Data collection tools

In this study, patient information form, state-trait anxiety ınventory, and the visual analog scale for pain were used as data collection tools.

Patient information form

The patient information form contains 10 questions about sociodemographic characteristics, CA procedure, and medical history.

State-Trait Anxiety Inventory

The validity and reliability of the State-Trait Anxiety Inventory (STAI) were developed by Spielberger et al[18] and, in Turkish society, were performed by Öner and Le Compte.[19] The inventory

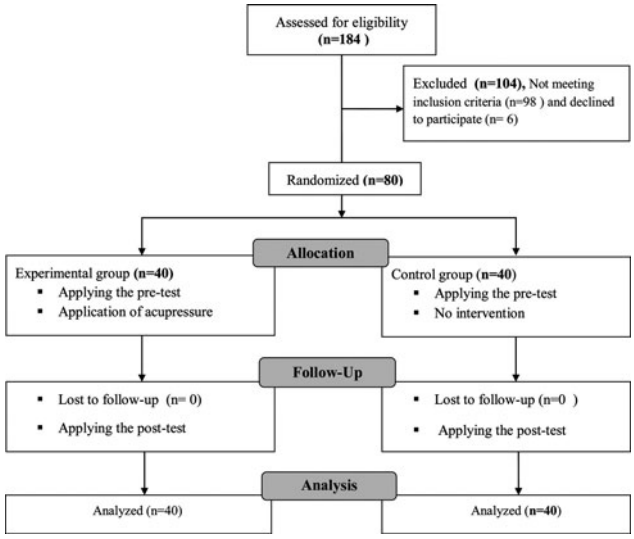

FIGURE 1. Consort diagram of the study.

consists of 2 parts and each part contains 20 questions with a 1 to 4 scoring system: State Anxiety Inventory (STAI-1) assesses how an individual feels at a certain time and under certain conditions; Trait Anxiety Inventory (STAI-2) determines how the individual usually feels, regardless of the situation and circumstances. In both scales, 0 to 40 points indicate no anxiety, 41 to 60 points indicate mild anxiety, and 61 points and above indicate severe anxiety.[18] In the Turkish adaptation of the scale, the reliability coefficients determined with α correlations were between 0.83 and 0.92 for the state anxiety scale and between 0.83 and 0.87 for the trait anxiety scale.[19]

The visual analog scale for pain

It is used to measure and follow the severity of pain. It is a 10-cm ruler with painlessness on one end and the most severe pain on the other.[20] The pain intensity of the patients was measured 3 times with the visual analog scale for pain (VASP), and each evaluation was defined as VASP1, VASP2, and VASP3. Pain severity was measured before acupressure and CA and called VASP1. VASP2 was measured after CA and the patient was admitted to the cardiology service within 15 minutes. VASP3 was measured an hour after VASP2 measurement.

Data collection

The data were collected using a patient information form, the VASP, and STAI. Personal information form, STAI, and VASP1 were applied to the control and intervention groups 1 or 2 hours before undergoing the CA procedure. STAI-1 (state anxiety inventory) was reevaluated after acupressure and just before the patient in the intervention group underwent CA. STAI-1 was not reapplied to the control group because no intervention was done to the control group. After the CA procedure, the pain of the patients in intervention and control groups was evaluated with VASP2 and VASP3. The pain of the patients in the intervention and control groups was evaluated with VASP2 within 15 minutes after the patient was admitted to the clinic from the angiography unit. The pain intensity of the patients in both the intervention and control groups was evaluated again with VASP3 1 hour after VASP2. Data collection forms were applied by face-to-face interview technique. All data were collected by the same researcher.

Acupressure application

In the study, acupressure was applied to the intervention group 30 to 60 minutes before the CA procedure. Based on the literature, acupressure points LI4, HT7, and Extra 1 acupoints were selected for acupressure application.[21-29] Acupressure was applied to patient by a certified practitioner who received training in acupressure. Acupressure was applied in the patient room. All rooms have washbasins for handwashing and the process was initiated by providing hand hygiene, explaining the acupressure attempt, and obtaining the verbal/written permission of the patient. Patient rooms are single and double rooms and a privacy cover was used in double rooms. Visitors and accompanying persons were taken outside of the room before acupressure was applied. The patient was placed in a comfortable supine/semifowler/fowler position. Acupressure points were determined according to their anatomical location and the Cun technique.[30] Acupressure points were in the order of LI4, HT7, and Extra 1 acupoints. Sequential pressures were applied to the points LI4 and HT7 symmetrically with the thumb and index fingers, which increased in intensity and did not cause pain in the patient. Acupressure was applied to the Extra 1 acupoint with the thumb and with circular movements and consecutive presses. Acupressure application time was 11 minutes in total: 3 minutes at LI4, 3 minutes at HT7, and 5 minutes to Extra 1. Communication with the patient was limited during the acupressure application and the patient was able to focus on the procedure. The patient's response to the

acupressure application was recorded. No side effects related to acupressure application were found in patients. The anatomical location of the selected acupressure points is illustrated in Figure 2.

Data analysis

In this study, the data were evaluated with the SPPS 17 statistics program (Statistical Package for the Social Sciences). In the analysis of patient information characteristics, descriptive tests (percentile, arithmetic mean, standard deviation, minimum-maximum) were used and *t* test in independent groups was used for evaluation of acupressure efficacy.

Ethical aspects of the research

To conduct the study, institutional permission was obtained from the hospital where the research was carried out and ethics committee approval was obtained from the ethics committee of a University (2018/3-25). Written and verbal consent was obtained from the patients.

RESULTS

The mean age was 52.36 ± 14.14 years; there were no statistically significant differences in age, gender, marital status, education level, history of hospitalization, and having surgery between intervention and control groups ($P > .05$). It was determined that the intervention and control groups have similar characteristics (Table 1).

It was found that the difference between the mean pain intensity measured by VASP1 of the intervention and control groups was not statistically significant ($P > .05$). There was a statistically significant difference between the pain severity averages of the intervention and control groups evaluated with VASP2 and VASP3. It was found that the VASP2 and VASP3 pain severity averages of the intervention group were significantly lower than those of the control group ($P = .000$) (Table 2).

It was determined that there was no statistically significant difference between the baseline STAI-1 and STAI-2 mean scores of the intervention and control groups ($P > .05$). The mean of STAI-1 of the intervention group after acupressure was 41.50 ± 3.88, which was statistically significantly lower than the mean of the control group ($P = .000$) (Table 3).

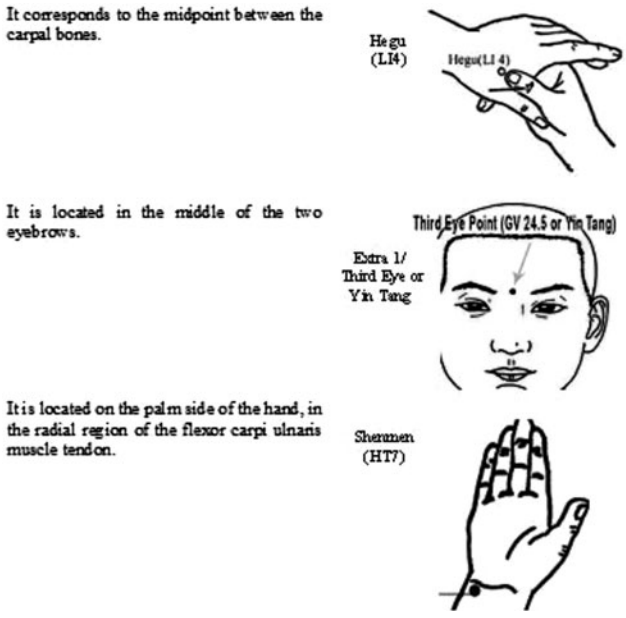

FIGURE 2. Acupoints and their positions.

DISCUSSION

In this study, which aimed to determine the effect of acupressure including LI4, HT7, and Extra 1 acupoints on anxiety and pain severity of patients undergoing CA, the mean of STAI-1 of the intervention group after acupressure was 41.50 ± 3.88, which was statistically significantly lower than the mean of the control group ($P = .000$). Initially evaluated anxiety levels of the patients in the intervention and control groups indicate that the patients experienced mild anxiety. But after acupressure there was a decrease of approximately 5.7 points in the intervention group anxiety score average. This change shows that the intervention had a positive effect on the mild anxiety experienced by the intervention group patients. In the study carried out by Rajai et al[31] to determine the effect of acupressure on the level of anxiety in patients scheduled for CA, after acupressure applied to the Nei Guan (P6) point, the anxiety level of the intervention group decreased significantly compared with the control group. Mansoorzadeh et al[22] reported that anxiety was significantly lower in the group in which acupressure was applied to the right points than in the fake group, according to the study conducted to evaluate the effect of acupressure protocol including HT7 and Extra 1 points on anxiety in patients undergoing cardiac catheterization. Rahmani Vasokolaei et al,[25] in their comparative study evaluating the effects of acupressure and reflexology

TABLE 1. Patient Characteristics

Patient Characteristics	Intervention Group n (%)	Control Group n (%)	Total n (%)	Homogeneity of Variances
Gender				
Female	22 (55)	26 (65)	48 (60)	$\chi^2 = 0.83$
Male	18 (45)	14 (35)	32 (40)	$P = .361$
Total	40 (100)	40 (100)	80 (100)	
Age, mean ± SD, y	52.80 ± 14.68	51.92 ± 13.76	52.36 ± 14.14	$t = 0.275$
				$P = .784$
Marital status				
Single	3 (7.5)	3 (7.5)	6 (7.5)	$\chi^2 = 1.00$
Married	37 (92.5)	37 (92.5)	74 (92.5)	$P = 1.00$
Educational level				
Elementary school and lower	35 (87.5)	30 (75.0)	65 (81.3)	$\chi^2 = 0.15$
High school and higher	5 (12.5)	10 (25.0)	15 (18.8)	$P = .252$
Hospitalization history				
Yes	27 (67.5)	32 (80.0)	59 (73.8)	$\chi^2 = 0.20$
No	13 (32.5)	8 (20.0)	21 (26.3)	$P = .310$
Mean of hospitalizations, mean ± SD	1.70 ± 0.86	1.53 ± 0.76	1.61 ± 0.80	$t = -0.81$
				$P = .420$
Having surgery				
Yes	22 (55.0)	24 (60.0)	46 (57.5)	$\chi^2 = 0.65$
No	18 (45.0)	16 (40.0)	34 (42.5)	$P = .821$

applied to female patients with CAD on anxiety and vital signs, reported that the anxiety level of the acupressure group was statistically significantly lower than that of the placebo group. However, they state that acupressure and reflexology have an equal effect on anxiety management.[25] In their study, to evaluate the effect of acupressure among cardiac surgery patients on anxiety and sleep quality, Aygin and Şen[28] determined that there was a significant difference between the anxiety levels of the intervention and control groups, the anxiety of the experimental group was lower. In the same study, acupressure was reported to be 92.7% effective in reducing postoperative anxiety.[28] In the study by Agarwal et al,[24] in which they evaluated the effectiveness of acupressure at the Extra 1 point on preoperative anxiety, they reported that the anxiety level of the intervention group was statistically significantly lower than that of the placebo group. Valiee et al[26] stated that acupressure had a greater effect on management of preoperative anxiety than placebo in patients undergoing abdominal surgery. Similarly, in studies conducted with different patient groups, acupressure was found to be effective in anxiety management. Rizi et al[21] reported that the application of acupressure at LI4 and HT7 points was effective on anxiety in patients with cancer. Abadi et al[32] pointed out that the application of acupressure at HT7 and Extra 1 points in patients scheduled for preoperative cesarean section was an effective method of anxiety management. Valiee et al[26] stated that acupressure at Yintang (Ektra 1) and Shen men (HT7, at the ear) points is

TABLE 2. Mean Scores of Pain of Intervention and Control Groups at Baseline and After Coronary Angiography

	Intervention Group	Control Group	Homogeneity of Variances
VASP1	0.55 ± 1.13	0.50 ± 1.32	$t = 0.183$
			$P = .856$
VASP2	0.52 ± 1.26	2.32 ± 2.72	$t = 3.796$
			$P = \mathbf{.000}$
VASP3	0.4 ± 1.19	2.47 ± 2.78	$t = 4.281$
			$P = \mathbf{.000}$

TABLE 3. Mean Scores of Anxiety of Intervention and Control Groups

	Intervention Group	Control Group	Homogeneity of Variances
STAI-1 at baseline	47.22 ± 4.53	47.92 ± 4.96	$t = 0.658$ $P = .512$
STAI-2 at baseline	45.87 ± 6.32	46.30 ± 6.28	$t = 0.301$ $P = .764$
STAI-1 after intervention	41.50 ± 3.88	47.92 ± 4.96	$t = 6.41$ $P = .000$

more clinically beneficial in reducing higher preoperative anxiety than the application of the sham points in patients before abdominal surgery. In the study by Kwon and Lee[33] that evaluated the effectiveness of acupressure or acupuncture applied only to the Extra 1 point on anxiety, 5 randomized controlled trials were included in the sample, and it was reported that there was a statistically significant decrease in the anxiety after the acupressure application. According to the meta-analysis study carried out to evaluate the effectiveness of acupressure on anxiety, it was reported that the most frequently used points in anxiety management are HT7 and Extra 1 points, and it was emphasized that acupressure had a moderate effect on anxiety management.[23] In line with this study and literature, it shows that acupressure application including HT7, LI4, Extra 1, and P6 points is an effective nonpharmacological application in the management of anxiety of various patient groups.

In this study, while there was no difference between the mean pain scores of the intervention and control groups evaluated as VASP1 before CA and acupressure at baseline, a statistically significant difference was found between the VASP2 and VASP3 pain scores of the intervention and control groups after acupressure and CA procedure ($P = .000$). In the study by Narimani et al[34] evaluating the effect of acupressure on pain severity in patients undergoing coronary artery graft, they found a statistically significant difference in the pain level of the intervention group after 20 minutes of acupressure applied to the LI4 point. According to a study conducted to evaluate the effectiveness of acupressure applied to LI 4 and Extra 1 points on acute pain before the invasive venous intervention, acupressure was effective for reducing the pain of invasive venous intervention.[27] In a study conducted by Alavi[35] to evaluate the effectiveness of acupressure applied before intramuscular penicillin injection on pain, it was reported that acupressure was effective in relieving intramuscular injection pain. So, these results indicate that acupressure is an effective complementary therapy in the management of acute pain after minor or major surgical procedures.

In this research intervention group, acupressure was applied only once and its effectiveness was evaluated afterward. This situation can be considered as a limitation of the research. These research results can be generalized to this population.

CONCLUSION

Based on the results of this study, it can be concluded that acupressure including LI4, HT7, and Extra 1 points is effective in the management of state anxiety and pain severity of patients undergoing CA. Nursing plans should be more intensively focused on those patients with high anxiety levels for reducing pain and anxiety. This research shows that acupressure has a positive effect on CA patients in Turkish society. For this reason, it is recommended that studies evaluating the effectiveness of acupressure in patients who are planned for CA should be conducted on large samples and in different cultures.

REFERENCES

1. Cardiovascular diseases (cvds). World Health Organization. https://www.who.int/en/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds). Published June 11, 2021. Accessed September 13, 2022.
2. Tüik kurumsal - data.tuik.gov.tr. https://data.tuik.gov.tr/Bulten/Index?p=Olum-Nedeni-Istatistikleri-2017-27620. Published April 26, 2018. Accessed September 13, 2022.
3. Baim DS, Grossman W. Grossman's cardiac catheterization, angiography, and intervention. Philadelphia, PA: Lippincott, Williams & Wilkins; 2005.
4. West R, Ellis G, Brooks N. Complications of diagnostic cardiac catheterisation: results from a confidential inquiry into cardiac catheter complications. *Heart*. 2005;92(6):810-814. doi:10.1136/hrt.2005.073890.

5. Heikkilä J, Paunonen M, Virtanen V, Laippala P. Fear of patients related to coronary arteriography. *J Adv Nurs*. 1998;28(1):54-62. doi:10.1046/j.1365-2648.1998.00764.x.
6. Ozdemir PG, Selvi Y, Boysan M, Ozdemir M, Akdağ S, Ozturk F. Relationships between coronary angiography, mood, anxiety and insomnia. *Psychiatry Res*. 2015;228(3):355-362. doi:10.1016/j.psychres.2015.05.084.
7. Spielberger CD, Rickman RL. Assessment of state and trait anxiety in cardiovascular disorders. In: Sartorious N, Andreoli V, Cassano G, et al., eds. *Anxiety Psychobiological and Clinical Perspectives*. New York, NY: Hemisphere Publishing Corporation; 1990:69-82.
8. Mikosch P, Hadrawa T, Laubreiter K, et al. Effectiveness of respiratory-sinus-arrhythmia biofeedback on state-anxiety in patients undergoing coronary angiography. *J Adv Nurs*. 2010;66(5):1101-1110. doi:10.1111/j.1365-2648.2010.05277.x.
9. Uzun S, Vural H, Uzun M, Yokusoglu M. State and trait anxiety levels before coronary angiography. *J Clin Nurs*. 2008;17(5):602-607. doi:10.1111/j.1365-2702.2007.02018.x.
10. Delewi R, Vlastra W, Rohling WJ, et al. Anxiety levels of patients undergoing coronary procedures in the catheterization laboratory. *Int J Cardiol*. 2017;228:926-930. doi:10.1016/j.ijcard.2016.11.043.
11. McCaffrey R, Taylor N. Effective anxiety treatment prior to diagnostic cardiac catheterization. *Holist Nurs Pract*. 2005;19(2):70-73. doi:10.1097/00004650-200503000-00007.
12. Monahan FD, Sands JK, Neighbors M, Marek JF, Green CJ. *Phipps's Text book Medical—Surgical Nursing*. 8th ed. Mosby Co, 2007; 1: 321-324.
13. Memarian R. The concept of pain. In: *Application of Concepts and Nursing Theories*. Tehran, Iran: University of Tarbiat Modares; 1999: 123-158.
14. Andrews S, Dempsey B. Acupressure and reflexology essentials. In: *Acupressure & Reflexology for Dummies*. Indianapolis, IN: Wiley Publishing, Inc; 2007:10-65.
15. McGovern K, Lockhart A. *Nurse's Handbook of Alternative & Complementary Therapies*. Philadelphia, PA: Lippincott Williams & Wilkins; 2003.
16. Robinson N, Lorenc A, Liao X. The evidence for Shiatsu: a systematic review of Shiatsu and Acupressure. *BMC Complement Altern Med*. 2011;11(1). doi:10.1186/1472-6882-11-88
17. Cohen J. *Statistical Power Analysis*. 2nd ed. Hillsdale, NJ: Erlbaum; 1988.
18. Spielberger CD, Gorsuch RL, Lushene RE. *Manual for State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press; 1970.
19. Öner N, Le Compte A. Süreksiz Durumluk/Sürekli Kaygı Envanteri El Kitabı, 1. Baskı. İstanbul, Türkiye: Boğaziçi Üniversitesi Yayınları; 1983: 1-26.
20. Çöçelli LP, Bacaksız BD, Ovayolu N. Nurse factor in pain therapy. *Gaziantep Tıp Dergisi*. 2008;14: 53-58.
21. Rizi MS, Shamsalinia A, Ghaffari F, Keyhanian S, Nabi BN. The effect of acupressure on pain, anxiety, and the physiological indexes of patients with cancer undergoing bone marrow biopsy. *Complement Ther Clin Pract*. 2017;29:136-141. doi:10.1016/j.ctcp.2017.09.002.
22. Mansoorzadeh KH, Afazel MR, Taghadosi M, Gilasi HR. The effect of acupressure on anxiety and dysrhythmia in patients undergoing cardiac catheterization. *Life Sci J*. 2014;11(1):153-157.
23. Au DWH, Tsang HWH, Ling PPM, Leung CHT, Ip PK, Cheung WM. Effects of acupressure on anxiety: a systematic review and meta-analysis. *Acupunct Med*. 2015;33(5):353-359. doi:10.1136/acupmed-2014-010720.
24. Agarwal A, Ranjan R, Dhiraaj S, Lakra A, Kumar M, Singh U. Acupressure for prevention of pre-operative anxiety: a prospective, randomised, placebo controlled study. *Anaesthesia*. 2005;60(10):978-981. doi:10.1111/j.1365-2044.2005.04332.x.
25. Rahmani Vasokolaei Z, Rejeh N, Heravi-Karimooi M, et al. Comparison of the effects of hand reflexology versus acupressure on anxiety and vital signs in female patients with coronary artery diseases. *Healthcare*. 2019;7(1):26. doi:10.3390/healthcare7010026.
26. Valiee S, Bassampour SS, Nasrabadi AN, Pouresmaeil Z, Mehran A. Effect of acupressure on preoperative anxiety: a clinical trial. *J Perianesth Nurs*. 2012;27(4):259-266. doi:10.1016/j.jopan.2012.05.003.
27. Hosseinabadi R, Biranvand S, Pournia Y, Anbari K. The effect of acupressure on pain and anxiety caused by venipuncture. *J Infus Nurs*. 2015;38(6):397-405. doi:10.1097/nan.0000000000000065.
28. Aygin D, Şen S. Acupressure on anxiety and sleep quality after cardiac surgery: a randomized controlled trial. *J Perianesth Nurs*. 2019;34(6): 1222-1231. doi:10.1016/j.jopan.2019.03.014.
29. Wang T, Deng R, Tan JY, Guan FG. Acupoints stimulation for anxiety and depression in cancer patients: a quantitative synthesis of randomized controlled trials. *Evid Based Complement Alternat Med*. 2016;2016:5645632. doi:10.1155/2016/5645632.
30. Mucuk S, Ceyhan Ö. Acupressure. In: Başer M, Taşçı S. eds. *Complementary and Supporting Practices with Evidence-Based Guides*. 1st ed. Ankara, Turkey: Akademisyen Tıp Kitabevi; 2015:205-245.
31. Rajai N, Choopani N, Pishgouyi SAH, Sharififar S. The effect of acupressure on anxiety of patients candidate for coronary angiography. *Mil Caring Sci*. 2015;2(1):6-13. doi:10.18869/acadpub.mcs.2.1.6.
32. Abadi F, Abadi F, Fereidouni Z, Amirkhani M, Karimi S, Kalyani MN. Effect of acupressure on preoperative cesarean section anxiety. *J Acupunct Meridian Stud*. 2018;11(6):361-366. doi:10.1016/j.jams.2018.07.001.
33. Kwon CY, Lee B. Acupuncture or acupressure on yintang (EX-HN 3) for anxiety: a preliminary review. *Med Acupunct*. 2018;30(2):73-79. doi:10.1089/acu.2017.1268.
34. Narimani M, Ansari Jaberi A, Negahban Bonabi T, Sadeghi T. Effect of acupressure on pain severity in patients undergoing coronary artery graft: a randomized controlled trial. *Anesth Pain Med*. 2018; 8(5):e82920. doi:10.5812/aapm.82920.
35. Alavi NM. Effectiveness of acupressure to reduce pain in intramuscular injections. *Acute Pain*. 2007;9(4):201-205. doi:10.1016/j.acpain.2007.09.002.