



## THE EFFECT OF FOOT REFLEXOLOGY MASSAGE ON THE MOOD OF PATIENTS AFTER CORONARY ARTERY BYPASS GRAFT SURGERY

Zahra Shafiei<sup>1</sup>, Leila akbari<sup>2\*</sup>

1. *MSC; Department of operating room, School of Nursing, Isfahan University of Medical Sciences, Isfahan, Iran*
2. *MSC; Department of operating room, School of Nursing, Isfahan University of Medical Sciences, Isfahan, Iran*

### ARTICLE INFO

**Received:**

03<sup>th</sup> Jun 2017

**Accepted:**

29<sup>th</sup> Nov 2017

**Available online:**

14<sup>th</sup> Dec 2017

**Keywords:** *Self Medication, Dietary Supplements, Vitamins, Minerals, Consequences*

### ABSTRACT

The purpose of this study was to explore the effect of foot reflexology massage on the mood of the patients after coronary bypass graft surgery.

**Design:** In this randomized control trial, 72 patients who underwent CABG<sup>1</sup> were selected. They were randomly divided to two groups after they were matched on gender.

**Interventions:** The intervention group (n = 36) received foot reflexology massage in 4 consecutive sessions of 4 days, 3 to 6 days after the cardiac surgery, while the control group received a gentle foot rub with oil for one minute.

**Setting:** The study was done in Isfahan Chamran Hospital from December 2011 to May 2012.

**Main outcome measures:** The mood questionnaire (POMS<sup>2</sup>) which has been completed the day before the start of the study and intervention and then after the last day of the intervention.

**Methods:** data was analyzed using the Chi-Square test, independent and paired t-test.

**Results:** The comparison of the study results showed that foot reflexology massage decreased the mood overall rating of the patients after the surgery that means this method can improve the mood in the patients after cardiac surgery.

**Conclusions:** The significant improvement in the mood states in the experimental group following the foot reflexology massage supports the use of this technique for cardiac surgery patients.

Copyright © 2013 - All Rights Reserved - Pharmacophore

**To Cite This Article:** Shumaila Arshad, Rabbiah Aslam, Hafiz M. Bilal Tufail, Arooj Mohsin Alvi, Freeha Anwar<sup>4</sup>, Muhammad Sajjad, (2017), "a survey of self-medication with dietary supplements among pharmacy students of punjab, pakistan", *Pharmacophore, 8(6S), e-1173318.*

### Introduction

Cardiovascular diseases have had the highest death rates and it will remain the primary cause of death in the world until 2020. Nearly 52 percent of deaths in the United States and 48 percent in Europe are related to these diseases.<sup>1</sup> A large number of coronary artery diseases which do not respond to medical therapy, are faced with coronary artery bypass graft surgery.<sup>2</sup> This common procedure is being done in the medical world during 35 years.<sup>3</sup> Thousands of open heart surgeries are doing in The United States annually that this number regarding heart bypass surgery is estimated 363000 cases annually.

Twenty-five thousand of open heart surgeries in Iran which 50 to 60 percent of them are CABG.<sup>4</sup>

One of the important aspects of the recovery period after heart surgery is the patient's psychological status, which has an important role in other aspects of social functioning and resumption of the work and activities.<sup>5</sup> In the early period of recovery, the patients are faced with moderate symptoms of anxiety and depression<sup>(6, 7)</sup> that followed with fatigue, sleep disorders and

<sup>1</sup> - Coronary Artery Bypass Graft

<sup>2</sup> - Profile of Mood States.

mood changes such as stress, fear, confusion, agitation, irritability, fear and anger (due to feelings of worthlessness, lack of control and self-esteem).<sup>8</sup> Many factors cause mood changes in these patients which between them, it can be noted to severe chest pain and fatigue. Fear of death, disability, the symptoms continuation despite the treatment and lack of preparation prior to surgical patients may increase these problems.<sup>1</sup> Anxiety and apprehension will cause the increased activity of the sympathetic nervous system. The situation will be followed by increased heart rate and ventricular pressure. The heart's need to oxygen will increase and it can exacerbate the symptoms of cardiovascular of the patients.<sup>9</sup> However, today the pharmacologic agents are used in order to reduce this problems but these drugs have some side effects. Thus, comprehensive attention to the needs of patients (including their psychological needs) has particular importance for the nurses as the first people who faced with symptoms and the patients' needs.<sup>10</sup> In this regard, various nursing interventions as complementary therapy practices help patients to achieve physical and psychological needs and one of them uses complementary therapies after heart surgery.<sup>11</sup> The most popular forms of complementary medicine is foot reflexology massage that is based on the notion that it stimulates energy flow within the body from the feet to the head, which can decrease sympathetic nervous system arousal, relieve anxiety and promote relaxation.<sup>(1, 9, 12)</sup>

There are a few researches relating to the effects of foot reflexology massage on mood in cardiac surgery patients.<sup>(13, 14)</sup>

In these studies only focused on anxiety or stress after cardiac surgery and there is no research about all aspects of mood. Hence, the aim of this study was to determine the effects of foot reflexology massage on the mood of patients after coronary artery bypass graft surgery in Isfahan Chamran Hospital during 2011-12.

### Methods

This randomized clinical trial study was contained of 72 patients who were underwent CABG. The study inclusion criteria were included: full consciousness, study participation, ages 18-75 years, no usage of various methods of complementary medicine during 3 months ago, connected time to the pump for less than 4 hours, the absence of severe neuropathy in a patient and receiving the permission from the patient's physician and exclusion criteria were tracheal intubation for more than 24 h, need for intra-aortic balloon pump, heart valve repair or replacement during CABG surgery, bleeding >200 ml per hour via a chest tube, alcohol and drug addiction, history of chronic pain, skin infections and skin ulcers on the left leg, fractured bones, skin grafts and sensory impairments,

The researcher prepares the patient and the patient's environment ready before the foot reflexology massage intervention. The patient demographic questionnaire and the profile of the mood states that contained 65 items asked by a colleague and were completed.

The Ethics Committee of Isfahan University of Medical Sciences approved the study. A written consent was obtained from all of the patients.

### Interventions

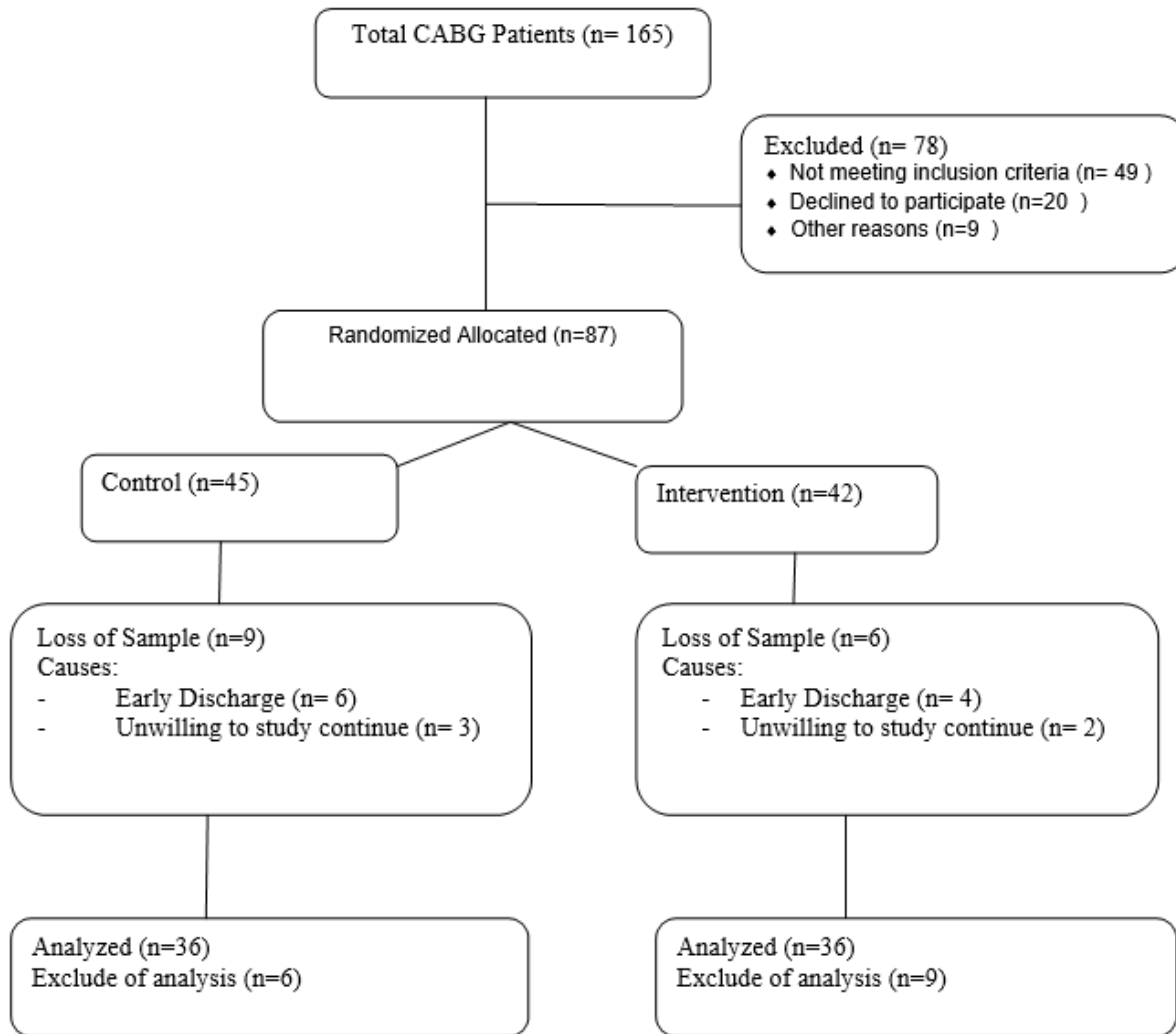
According to Pollard et al. (2006), the reflex points on the left foot correspond to the left side of the body and those on the right foot correspond to the right side of the body.<sup>15</sup>

A soothing baby oil that did not have any treatment value used on the participants' left feet for one minute, followed by foot reflexology massage on the sole of the foot for 20 min. The researcher used soothing hand movements applied on the foot in the first and last 3 min of the sessions and then began the massage by applying their palm to the outer edge of the foot, moving it back and forth. Afterwards reflexology was done for all parts of the foot by Ingham method. In the control group, the left leg was softly rubbed with the soothing baby oil for one minute, and the researcher stayed with the patients for about 20 min. It was conducted for four consecutive sessions of 4 days, 3 to 6 days after the open-heart surgery during 10 am to 2 pm. The above steps were repeated four consecutive days for each subject.

At least 4 h after the administration of the last dose of analgesics, the intervention was performed.

### Randomization and blinding

The present study was a randomized one-blinded clinical trial. The questionnaire was completed by fellow questioner who did not inform the group of patients. The study was performed in the period of December 2011 to May 2012 in Isfahan Chamran Hospital. It was done on two groups of patients undergoing coronary artery bypass graft surgery with inclusion criteria. Among these patients (165 person), 72 patients were selected according to other studies<sup>(7, 14)</sup> and the professors' point of views. The sampling method was easy to approach. After receiving the written consents, they were consecutive gender-matched and then randomly divided into intervention and control groups. Thus, the questionnaires were numbered from one to 72 and were placed inside an envelope. While sampling, a questionnaire was randomly chosen within the envelope. If the number was odd, the patient was placed in the control group and if it was an even number, the person was placed in the intervention group (See study flowchart. **(Figure 1)**)



**Figure 1.** The study flowchart

**Outcomes and their measurements**

The patients' age, gender, education and marital status, occupation, history of diabetes mellitus, heart drug use and smoking and duration of heart disease were evaluated by using demographic questionnaire.

The mood changes were measured using POMS questionnaire which is a standard questionnaire was made By Mac Nir et al in 1871 and its validity and reliability were determined in various studies including the research of Albert et al and Babae et al. (7, 1) The reliability of this questionnaire in nursing was studied by calculating the Cronbach's alpha by Targari et al (16) and also Fazel et al (17) by conducting the study on 20 patients. Moreover, the POMS questionnaires in both studies was confirmed with  $\alpha = 0.81$ . The researcher used the content validity method to determine its validity. The questionnaire, once again, was completed to determine the reliability in the last day of hospitalization after the surgery. The Pearson correlation test was calculated and the results were as follows: 0.97 for anxiety, 0.91 for depression, 0.95 for anger, 0.95 for the ability, 0.98 for fatigue and 0.98 for confusion. The questionnaire included 65 items in the following six groups: anxiety, depression, fatigue, confusion, anger, and ability. The questionnaire was including: 9 cases of anxiety, 15 cases of depression, 12 cases of anger, 8 cases of the ability, 7 cases of fatigue and 7 cases of confusion. Seven other cases were for displaying and the enrichment of the questionnaire. These cases were not calculated in scoring the questionnaire. Each item was accounted by using the Likert scale from score of zero (never) to four (very much). Thus, the variable scores were as follows: 0-36 for the subgroup of anxiety, 0-60 for the depression subgroup, 0-48 for the subgroup of anger, 0-32 for the subgroup of the ability, 0-28 for the subgroup of fatigue and 0-28 for the subgroup of confusion. In order to calculate the total mood score, the score of the five negative factors (including anxiety, depression, anger, fatigue and confusion) were added together. The positive mood score (the ability) was deducted from the mentioned score. Thus, the total score was ranged between 0 and 168 and the lower scores indicated better mood.<sup>1</sup>

**Statistical analysis**

Data analysis was done by using SPSS 16.0 software and significant level was set at 0.05. Chi-square test, independent and paired t-test were used for analyzing data.

## Results

Reviewing the obtained results in two groups indicated that there was no significant difference in terms of demographic data between the two groups ( $P > 0.05$ ) (**Table 1**).

## Mood states

As it can be observed, statistical paired t-test showed that there is a significant difference between the mean overall rating mood and vital signs (before and after the intervention) in the massage group ( $P < 0.001$ ) (**Table 2**).

The statistical paired t-test also showed that there is a significant difference in the mean mood overall ratings (before and after the intervention) in the control group ( $P < 0.001$ ) (**Table 3**).

But statistical independent t-test showed that there is a significant difference between Changes in mood rating after the intervention in the intervention and control groups ( $P < 0.001$ ) (**Table 4**).

## Discussion

This study examined the effects of foot reflexology massage on mood in patients following CABG surgery. The results of this study showed that foot reflex massage could improve the mood in patients after the coronary artery bypass surgery. Bagheri-Nesami et al. (2014) studied the effects of foot reflexology massage on anxiety in patients following CABG and acquired results similar to this study. They state that the foot reflexology massage has significant effect on decrease of anxiety.<sup>13</sup> Also Bagheri-Nesami et al. (2012) studied the effects of foot reflexology massage on pain and fatigue of patients undergoing CABG. The results of their study showed that there was a significant decrease in pain and fatigue of patients.<sup>18</sup> In another study, Ahmadi et al. (2014) investigated the effects of metatarsus and ankle reflexology on state anxiety level after coronary artery bypass graft surgery and concluded that patients state anxiety significantly decreased in the intervention group.<sup>19</sup>

Cutshall et al. (2010) investigated the role of massage therapy in the Patients undergoing CABG and/or valvular repair or replacement. The experimental group received a 20 min full body massage while the control group was given standard care and a 20 min quiet time. Like the result of present study, the pilot study showed that massage therapy can reduce anxiety following cardiac surgeries.<sup>14</sup> Although reflexology and massage therapy have similarities to each other but there are several key differences between these. Both techniques are applied by hands but reflexology uses small muscle movements on feet and hands, whereas massage may be applied to the entire body.<sup>18</sup> Research studies have revealed that energy flows into vertical zones throughout the body in reflexology, which can calm the nerves, coordinate internal organs, and stimulate blood circulation.<sup>4</sup>

A study by Albert et al. (2009) concluded that massage therapy cannot provide any therapeutic benefit for cardiac surgery patients. According to this study, cardiac surgery patients were randomized to receive usual postoperative care or usual care along with two full body massages for 30 min each.<sup>7</sup> This result is in conflict with what we found in our study, which can be explained by the different methodologies and type of massages in these two studies. Moreover, Albert et al. (2009) focused on patients with any cardiac surgery in addition to CABG. Each type of heart surgery differ in the incision site, the time required for recovery and length of stay in hospital that they can be effective on patients' anxiety level.<sup>9</sup>

The study has also found that there was a significant difference in the mean mood scores (before and after the interventions) in the control group. Cutshall et al, Bauer et al and Hattan et al studies showed different results.<sup>(14, 20, 21)</sup> Comparing the results of the present study and the other mentioned studies can be justified that the surgery patients at admission are facing with more stress and anxiety. The patients' confidence has been grown by passing the time, the exit of chest tube, communication with family and other patients, gradually taking over the former tasks, reducing the amount of pain and improving the sleep quality. On the other hand, the patients are faced with an overall improvement in the mood by the increase in life expectancy and the reduction of anxiety and stress levels. However, as it can be seen in Table 4, the mean changes in mood scores (after the intervention) was more in the intervention group than the controls.

## Conclusions

According to the results of the present study, it can be stated that the use of massage therapy, as an effective nursing intervention, can improve the mood of patients after open-heart surgery. Given the low cost and simplicity of this method, it can be used as a supplement to drug therapy and postoperative interventions in these patients. Additional research is also needed to explore the effects of reflexology massage on sleep quality as well as wound healing in this group of patents.

## Conflict of interest statement

The authors declare no conflict of interest in this study.

**Acknowledgments:** Researchers want to thank Research Center of The school of Nursing and Midwifery of Isfahan University of Medical Sciences, collaborators and participants for their cooperation.

**Table 1.** Socio-demographic characteristics of samples

Variable	Group		P Value (Chi-square test)
	Control [N (%)]	Intervention [N (%)]	
<b>Age</b>			0.19
< 49 years	5(13.9)	7(19.4)	
50-59 years	15(41.6)	16(44.4)	
60-69 years	9(25)	7(19.4)	
> 70 years	7(19.4)	6(16.7)	
Mean ± Sd	56.8 ± 9.2	58.4 ± 8.8	
<b>Gender</b>			1
Female	18(50)	18(50)	
Male	18(50)	18(50)	
<b>Education</b>			0.75
Illiterate	20(55.6)	18(50)	
Primary/secondary	6(16.7)	8(22.2)	
School	3(8.3)	4(11.1)	
Diploma	6(16.7)	4(11.1)	
University graduate	1(2.8)	2(5.6)	
<b>Marital status</b>			0.78
Single	0	1(2.7)	
Married	36(100)	35(97.3)	
<b>Occupation</b>			0.48
Employee	1(2.8)	0	
Worker	1(2.8)	1(2.8)	
Retired	9(25)	7(19.4)	
Housekeeper	16(44.4)	16(44.4)	
Unemployed	9(25)	10(27.8)	
Other	0	2(5.6)	
<b>History of diabetes mellitus</b>			0.82
Yes	16(44.4)	17(47.2)	
No	20(55.5)	19(52.7)	
<b>History of heart drug use</b>			0.44
Yes	26(72.2)	23(63.9)	
no	10(27.8)	13(36.1)	
<b>Duration of heart disease (Month)</b>			0.62
1-12	13(36.1)	9(25)	
13-24	9(25)	12(33.3)	
25-36	8(22.2)	7(19.4)	
37-48	1(2.8)	2(5.5)	
>48	5(13.9)	6(16.7)	
<b>History of Smoking</b>			0.81
Yes	22(61.1)	21(58.3)	
no	14(38.9)	15(41.7)	

**Table 2.** Comparison of the mean rating of mood before and after the intervention in the intervention group

Group	Before intervention		After intervention		Paired t-test	
	Mean	SD	Mean	SD	P-value	T
Mood						
Anxiety	28.4	5.3	11.1	4.6	< 0.001	25.8
Depression	41.2	10.2	15.7	8.2	< 0.001	22.6
Anger	24.3	14.8	9.2	7.2	< 0.001	12.1
Ability	13.1	3.2	28.2	1.2	< 0.001	27.8
Fatigue	20.5	5.1	9.0	3.9	< 0.001	12.9
Confusion	18.5	6.2	6.7	4.6	< 0.001	11.8
Total	119.8	38.4	23.5	27.3	< 0.001	27.2

**Table 3.** Comparison of mean rating of the mood before and after the intervention in the control group

Group	Before intervention		After intervention		Paired t-test	
	Mean	SD	Mean	SD	P-value	T
Mood						
Anxiety	27.5	5.1	21.4	6.1	< 0.001	10.2
Depression	41.0	10.0	33.6	10.1	< 0.001	7.6
Anger	26.7	11.8	21.2	11.6	< 0.001	6.5
Ability	13.1	3.3	17.2	4.3	< 0.001	8.8
Fatigue	23.5	4.0	20.6	4.3	< 0.001	4.53
Confusion	15.4	6.8	12.8	7.1	< 0.001	4.36
Total	118.8	24.3	91.6	27.7	< 0.001	10.9

**Table 4.** Comparison of changes in mood ratings after the intervention in the intervention and control groups

Group	Before intervention		After intervention		Paired t-test	
	Mean	SD	Mean	SD	P-value	T
Mood						
Anxiety	- 17.3	3.6	- 6.1	3.5	< 0.001	13.4
Depression	- 25.5	7.4	- 7.4	5.8	< 0.001	13.4
Anger	- 15.1	8.2	- 5.5	4.8	< 0.001	6.8
Ability	15.1	3.2	4.1	3.1	< 0.001	16.1
Fatigue	-11.5	3.6	- 2.9	0.8	< 0.001	10.2
Confusion	- 11.8	4.2	- 2.6	0.4	< 0.001	10.4
Total	- 96.3	13.7	- 27.3	15.1	< 0.001	15.6

**References:**

- Babae S, Shafiei Z, Sadeghi MM, Nik AY, Valiani M. Effectiveness of massage therapy on the mood of patients after open-heart surgery. *Iranian journal of nursing and midwifery research*. 2012;17(2 Suppl 1):S120-4.
- Deyirmenjian M, Karam N, Salameh P. Preoperative patient education for open-heart patients: a source of anxiety? *Patient education and counseling*. 2006;62(1):111-7.
- Brunner LS, Smeltzer SCC, Bare BG, Hinkle JL, Cheever KH. *Brunner & Suddarth's textbook of medical-surgical nursing: Lippincott Williams & Wilkins*; 2010.
- Babajani S, Babatabar H, Ebadi A, Mahmoudi H, Nasiri E. The effect of foot reflexology massage on the level of pain during chest tube removal after open heart surgery. *Journal of Critical Care Nursing*. 2014;7(1):15-22.
- Hazavehei S, Sabzmakan L, Hassanzadeh A, Rabiei K. The effect of PRECEDE Model-based educational program on depression level in patients with coronary artery bypass grafting. *The Journal of Qazvin University of Medical Sciences*. 2008;12(2):32-40.[Persian]
- Hata M, Yagi Y, Sezai A, Niino T, Yoda M, Wakui S, et al. Risk analysis for depression and patient prognosis after open heart surgery. *Circulation journal : official journal of the Japanese Circulation Society*. 2006;70(4):389-92.
- Albert NM, Gillinov AM, Lytle BW, Feng J, Cwynar R, Blackstone EH. A randomized trial of massage therapy after heart surgery. *Heart & Lung: The Journal of Acute and Critical Care*. 2009;38(6):480-90.
- Gardner G, Elliott D, Gill J, Griffin M, Crawford M. Patient experiences following cardiothoracic surgery: an interview study. *European Journal of Cardiovascular Nursing*. 2005;4(3):242-50.
- Gunnarsdottir TJ, Jonsdottir H. Does the experimental design capture the effects of complementary therapy? A study using reflexology for patients undergoing coronary artery bypass graft surgery. *Journal of clinical nursing*. 2007;16(4):777-85.
- Elliott D, Aitken L, Chaboyer W. *ACCCN's critical care nursing: Elsevier Australia*; 2011.
- Kshetry VR, Carole LF, Henly SJ, Sendelbach S, Kummer B. Complementary alternative medical therapies for heart surgery patients: feasibility, safety, and impact. *The Annals of thoracic surgery*. 2006;81(1):201-5.
- Chanif C, Petpichetchian W, Chongchareon W. Does foot massage relieve acute postoperative pain? A literature review. *Nurse Media Journal of Nursing*. 2013;3(1):483-97.
- Bagheri-Nesami M, Shorofi SA, Zargar N, Sohrabi M, Gholipour-Baradari A, Khalilian A. The effects of foot reflexology massage on anxiety in patients following coronary artery bypass graft surgery: a randomized controlled trial. *Complementary therapies in clinical practice*. 2014;20(1):42-7.
- Cutshall SM, Wentworth LJ, Engen D, Sundt TM, Kelly RF, Bauer BA. Effect of massage therapy on pain, anxiety, and tension in cardiac surgical patients: a pilot study. *Complementary therapies in clinical practice*. 2010;16(2):92-5.
- Pollard LC, Choy EH, Gonzalez J, Khoshaba B, Scott DL. Fatigue in rheumatoid arthritis reflects pain, not disease activity. *Rheumatology (Oxford, England)*. 2006;45(7):885-9.
- Tirgari B, Aghebati N, Fazel A, Koushiyar M, Mokhber N, Esmaili H. Adjuvant therapy relationship, with ascore of anxiety, depressionandfatiguein breastcancer patients. *Journal of Nursing and Midwifery, Kerman*. 2006;6(1-2):39-46.
- Fazel A TB, Mokhber N, Koushiyar M, Esmaily H. The Effect of Mastectomy on Mood and Quality of Life in Breast Cancer Patients. *JSSU*. 2008; 16 (3) :317-317.[Persian]
- Bagheri nm, zargar n, gholipour ba, khalilian a. The effect of foot reflexology massage on pain and fatigue of patients undergoing Coronary Artery Bypass Graft. 2012.
- Ahamadi M VRA, Rezaee M, Heydarpour B, Taghizaeh P. Comparing the effect of metatarsus and ankle reflexology massage on patients' state anxiety after coronary artery bypass graft surgery. *Iran J Crit Care Nurs*. 2014.6(4):229-234.

20. Bauer BA, Cutshall SM, Wentworth LJ, Engen D, Messner PK, Wood CM, et al. Effect of massage therapy on pain, anxiety, and tension after cardiac surgery: a randomized study. *Complementary therapies in clinical practice*. 2010;16(2):70-5.
21. Hattan J, King L, Griffiths P. The impact of foot massage and guided relaxation following cardiac surgery: a randomized controlled trial. *Journal of advanced nursing*. 2002;37(2):199-207.