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Evaluation of the effect of foot reflexology massage on vital signs and anxiety after blood transfusions in children with thalassemia



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ABSTRACT

Introduction: Thalassemia is the most common genetic disorder in the world. Children with major thalassemia face much lifelong stress and anxiety related to invasive methods of treatment including venipuncture and blood transfusion that cause discomfort and anxiety symptoms in children and changes their physiological indicators.

Methods: The aim of this study was to evaluate the effect of foot reflexology massage on vital signs and anxiety after blood transfusions in children with thalassemia. It was a quasi-experimental study, which conducted on 60 children with thalassemia who had inclusion criteria. Patients randomized into three groups of reflexology massage, regular massage, and control group. The level of anxiety in patients assessed by an anxiety measurement based on the Observational Scale of Behavioral

Distress-Revised (OSBD-R) and patients' vital signs measured 20 minutes before blood transfusion.

Results: A significant difference ($p=0.0001$) observed between the vital signs of children in reflexology massage group before and after the intervention. The average score for patient's anxiety before and after the intervention for reflexology massage group ($p=0.003$) and regular massage group ($p=0.005$) was significantly different, but in the control group showed no significant difference before and after the intervention ($p=0.09$). After the intervention, the mean score of anxiety in patients of the three groups was statistically significant ($p=0.0001$).

Conclusion: The results of this study confirm that foot reflexology massage affects vital signs of children with thalassemia undergoing a blood transfusion and reduces their anxiety.

Keywords: reflexology massage, vital signs, anxiety, thalassemia

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INTRODUCTION

Thalassemia is the most common genetic disorder in the world. Thalassemia syndromes are hereditary, biosynthesis, alpha or beta globin disorders. Globin source reduction reduces the production of hemoglobin tetramers, causing hypochromic and microcytosis. In this disease, deficiency in the production of beta protein in the hemoglobin results in life-threatening anemia and the patients' life necessarily depends on regular blood transfusions and permanent medical care.¹

About 200 million people worldwide suffer from this disorder.² This disease is found more among Mediterranean people and residents of Saudi Arabia, Iran, Africa, India and South China. Thousands of children suffering from thalassemia are born yearly, and the burden of this illnesses is especially heavy in developing countries. There are more than 20 thousand thalassemia patients in Iran, and about 1,600 people are added to the number annually.³ The highest prevalence of thalassemia in Iran (10%) is related to the cities of the Caspian Sea and the Persian Gulf, and the North of Iran has the most gene frequency.⁴ Sistan and

Baluchistan province with two million and seven hundred thousand inhabitants and 2000 patients with thalassemia major, has the highest number of thalassemia major patients among the provinces regarding the population.⁵

Children with major thalassemia face much stress and anxiety during their life. Frequent blood sampling for tests, fatigue caused by injections of blood and subcutaneous iron chelation injections, in addition to body hurts the spirit of these patients; so that most of these patients suffer mental disorders too.⁶ Fear and anxiety induced by the injections in these children are important to the extent that they express it as the most difficult aspect of their disease.⁷ One of the major interventions in this regard is to reduce the anxiety of children. In addition to the traditional methods, using nonmedical methods to deal with anxiety can be useful.⁸ Children's fear and anxiety control is one of the main objectives of nurses. Lack of control of the above cases followed by serious problems for the child and their family including problems such as reduced family satisfaction and reduced social, mental and physical

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functioning. As a result, anxiety that usually occurs during routine care interventions such as venipuncture and blood transfusion shall be reduced as much as possible.⁹ Inadequate relief of anxiety may cause fear in parents and children of future procedures.¹⁰ When a person faced with the threat posed by disease, trauma or psychological stress, physiological changes occur in their body. Physiological response to stress agent in cardiovascular systems causes high blood pressure, pulse rate and respiratory changes increase impaired oxygen saturation and raise the risk of arrhythmias.¹¹ Therefore, stress can play an important role in determining the physiological status and autonomic nervous system of a human.¹² For this purpose, an effective solution that is also effective for clinical use is very important.¹⁰

Unlike drug treatments, complementary therapies are economical with no serious side effects or drug interactions, simple and well accepted by the patients.¹³ Among non-pharmacological methods, foot reflexology massage can mention.¹⁴ Massage therapy is one of the most important complementary therapies in nursing, and many nurses value it. Adding it to the nursing skills increases the possibility to provide comprehensive care.¹⁵ Attention to complementary therapies in that nurses can do them without a physician's order and to pave the way for the independence of professional nursing is of great importance.¹⁶

The results of the study by Mohammad et al. on patients with stroke showed that parameters such as temperature, respiration, and blood oxygen saturation in the subjects in the control stages of foot reflexology remained unchanged, but heart rate stabilized significantly.²⁰ Mahmoudi-Rad et al. in a study on the effect of foot reflexology massage confirmed reduced anxiety of patients undergoing coronary artery angiography and suggested this method as a safe nonaggressive and affordable intervention that needs nothing except nurse's hands that can be used in all conditions without special tools in hospitals and health care centers to reduce the anxiety in patients.²¹ Salimi et al. in a study showed that therapeutic touch affected the pulse rate and respiratory rate, systolic blood pressure and behavior, but it had no significant effect on the temperature.²² The study by Mirzaee et al. showed that foot reflexology massage reduced anxiety in nulliparous women, but it did not affect blood pressure and pulse rate.²³ However, the study by Razmjoo et al. showed no effect of reflexology on anxiety level among women after cesarean section.²⁴ In the study by Albert et al., massage had little effect on physiological indicators (except for systolic and diastolic blood pressure), and psychosocial factors (depression, anxiety, and mood),²⁵ Tsay in his study

pointed on the effectiveness of reflexology on pain and anxiety reduction in patients after gastrointestinal surgery,⁶ but Ernest indicated the absence of convincing evidence on the effectiveness of reflexology to treat any medical condition in his review study.¹³

According to the differences observed in the findings and the results of literature review and previous studies, and since the researchers of the present study could not find a study in this regard on children with thalassemia and since studies show that invasive procedures to treat children thalassemia including venipuncture and blood transfusion cause anxiety in children and change physiological indicators, it is tried to use non-invasive, non-pharmaceutical, simple and inexpensive procedures as a nursing action appropriate to improve the condition. In this line, the research team decided to design and implement a study aiming at the "Evaluation of the effect of foot reflexology massage on vital signs and anxiety after blood transfusion in children with thalassemia."

MATERIALS AND METHODS

Research Subject and Design

The present study is a semi-experimental, a three-group study carried out with the aim to determine the effect of foot reflexology massage on vital signs and anxiety after blood transfusions in children with thalassemia in Zabol city in Iran in 2015. The sample size in this study was based on the following formula using the study by Sadat Hosseini et al¹¹ and 20 patients considered for each group with totally 60 patients for the three groups.

Research Tool and Data Collection

Random sampling performed among those with inclusion criteria. Inclusion criteria for the study included the following: Consent to participate in the study, aging less than 12 years, healthy and without ulcer massage area so that the child has no pain and anxiety of these procedures of intervention. The exclusion criteria were: the use of sedative or medications effective on anxiety, a decrease of vital signs more than expected (hypotension, the incidence of bradycardia or bradycardia dyspnea), resistance against the massage and the pain and anxiety due to this intervention procedure in children. The research tools included the questionnaire of demographic information, a form for recording vital signs, a form of the assessment of anxiety based on the Observational Scale of Behavioral Distress-Revised (OSBD-R). The questionnaire of demographic information of children including information such as age, sex, and diagnosis age

which was recorded through an interview with the child's parent or obtained from the information contained in the file. The vital sign included information related to blood pressure, heart rate, breathing and temperature that was completed before the foot reflexology massage and after transfusion in the intervention group and before the non-specific massage and after transfusion in the placebo group. In the control group, anxiety levels were measured 20 minutes before transfusion so that the effect of time in the three groups

To measure anxiety score, the form for measuring anxiety based on the Observational Scale of Behavioral Distress-Revised (OSBD-R) used which completed before foot reflexology massage and after transfusion in the placebo group. In the control group, anxiety levels were measured 20 minutes before transfusion so that time controlled in all three groups and it was measured again after transfusion. Observational Scale of Behavioral Distress is a standardized scale has frequently been used in various research and has good reliability and validity.⁹ This form has eight items, and its overall score is between 0 and 4. It means that every item receives 0.5 scores in case the behavior observed, and in the absence of the behavior, the score is zero. For scores, one and less (lack of anxiety), 1.5 to 2 (mild anxiety), 2.5 to 3 (moderate anxiety) and 3.5 to 4 (severe anxiety) considered.²⁴ Sadat Hosseini et al¹¹ have confirmed content validity of OSBD-R according to the views of 12 faculty members in Tehran University of Medical Sciences. Also, to assess the reliability of the tool, simultaneous rating by researcher and associate researcher for ten children undergoing invasive procedures used.

Before the intervention, the researcher prepared the patient and the environment for the intervention. Then, demographic information and vital signs questionnaires, as well as anxiety questionnaires, were completed. In reflexology massage group, provided a full explanation of the procedure. Patients lied down in a comfortable, usually supine position. A pillow put under the patients' leg, and the patient's pants were rolled up to the knee. The researcher sat in a quite comfortable and relaxed situation in front of the patient. Then the researcher applied a small amount of non-therapeutic baby lotion on his hand to facilitate massaging. First, the patient's legs examined for the masses, pain, and sensitivity. General massage of the leg performed after that. General massage is the background movements to warm up the legs. Of the leg to the ankle, sole, back, and the toes were massaged simply using the palm and fingers of one hand, and this movement repeated several times. The ankle was turned around several times while the heel

supported by one hand. These two techniques are relaxation techniques that relax the feet and legs and prepare the patient for specific reflexology. It took 2 minutes. For specific reflexology, massage began of the legs. Then it came to the lower leg and was performed with special attention to 4 important foot reflexology points that include solar plexus, pituitary, heart, and liver. Solar plexus is located in the distance between the upper and middle third of the sole. The pituitary point is located in the middle of the big toe. The points for the heart and liver are below the chest of the foot. The toes are also given a massage. Each of the foot reflexology points received specific circular massage using the middle part of the first knuckle of the index finger and thumb and the fleshy part of the other thumb of the researcher by a 0.5 cm push so that one-third of the nail bed became white, without cutting off fingers from foot skin. Reflexology massage with constant pressure and constant rotating clockwise movement performed for each part. Foot reflexology massage lasted 8 minutes for each foot. After completing one leg, the other leg received reflexology in the same way. The massage was first performed on the left foot and then on the right foot. Foot reflexology massage was performed 10 minutes for each leg and lasted 20 minutes for both legs. In the non-specific massage group, the technique was so that the researchers first prepared the patient's leg with a normal massage and then massaged the sole, the back and all the reflex points by a surface pressure avoiding in-depth and specific pressure on reflex points. In the control group, took no action.

STATISTICAL ANALYSIS

The data entered SPSS software after collection. Data analysis was performed using descriptive statistics (measures of central tendency, dispersion, frequency, and percentage) and inferential statistics.

RESULT

Participants in the study ranged from 6 to 12 years, and the control group had the highest average age (8.30 ± 1.97). Also, most of the patients in the intervention (75%), control (55%) and placebo (65%) groups were male. The maximum age of diagnosis in the intervention and control group was 2 years, and it was 1 year in the placebo group. The maximum age of diagnosis in all three groups was 11 years. The average age of diagnosis in the control group (6.41 ± 2.11) was higher than the other two groups.

The Wilcoxon test was used to check vital signs before and after the intervention. Based on the results in specific massage group, there was a

Table 1 The Comparison of the average vital signs of reflexology massage group before and after the intervention

Vital signs	Time	Before Intervention (Mean ± Standard Deviation)	After the Intervention (Mean ± Standard Deviation)	Statistical Test	p-Value
Systolic blood pressure		95.62 ± 7.56	85.72 ± 8.16	Wilcoxon	0.0001
Diastolic blood pressure		47.77 ± 5.48	41.20 ± 5.10	Wilcoxon	0.0001
Heart beat		109.90 ± 13.84	100.65 ± 13.67	Wilcoxon	0.0001
RR		25.12 ± 2.68	22.25 ± 2.16	Wilcoxon	0.0001
Temperature		36.48 ± 0.43	36.18 ± 0.52	Wilcoxon	0.0001

Table 2 The Comparison of the average non-specific vital signs in non-specific massage before and after the intervention

Vital signs	Time	Before Intervention (Mean ± Standard Deviation)	After the Intervention (Mean ± Standard Deviation)	Statistical Test	p-Value
Systolic blood pressure		95.02 ± 1.04	88.85 ± 11.76	Wilcoxon	0.0001
Diastolic blood pressure		47.00 ± 6.58	45.75 ± 7.02	Wilcoxon	0.6
Heart beat		106.92 ± 15.78	96.45 ± 12.82	Wilcoxon	0.1
RR		26.43 ± 3.45	25.25 ± 3.26	Wilcoxon	0.09
Temperature		36.45 ± 0.43	36.32 ± 0.52	Wilcoxon	0.12

Table 3 The Comparison of the mean vital signs in the control group before and after the intervention

Vital signs	Time	Before Intervention (Mean ± Standard Deviation)	After the Intervention (Mean ± Standard Deviation)	Statistical Test	p-Value
Systolic blood pressure		95.02 ± 8.80	96.42 ± 8.12	Wilcoxon	0.8
Diastolic blood pressure		47.20 ± 5.37	49.22 ± 4.48	Wilcoxon	0.1
Heart beat		109.90 ± 17.02	110.37 ± 14.16	Wilcoxon	0.59
RR		27.90 ± 1.29	25.62 ± 2.62	Wilcoxon	0.54
Temperature		36.19 ± 1.70	36.50 ± 0.40	Wilcoxon	0.15

Table 4 The Comparison of anxiety scores in each group before and after the intervention

Group	Anxiety	Mean ± Standard Deviation	Statistical Test	p-Value
Reflexology massage group	Before intervention	1.42 ± 1.27	Wilcoxon	0.003
	After the intervention	0.63 ± 0.70		
Non-specific massage group	Before intervention	1.63 ± 0.94	Wilcoxon	0.005
	After the intervention	0.83 ± 1.05		
Control group	Before intervention	1.15 ± 1.11	Wilcoxon	0.09
	After the intervention	1.40 ± 2.18		

statistically significant difference ($p < 0.050$) among all variables before and after the intervention (Table 1).

In the non-specific massage group, the mean systolic blood pressure prior to transfusion was higher compared to after transfusion, and this mean difference was statistically significant ($p < 0.05$). On the other hand, there was no statistically significant difference between the mean diastolic blood pressure, heart rate, respiratory rate and temperature before and after the transfusion ($p > 0.05$) (Table 2).

There was no statistically significant difference between mean vital signs of the control group before and after the intervention ($p > 0.5$) (Table 3).

In the assessment of anxiety in the reflexology massage group, the mean anxiety scores before the intervention was higher than after the intervention and this difference was statistically significant ($p < 0.5$). In the placebo group, the average score of anxiety before the intervention was higher than the average level of anxiety after the intervention, and this difference was statistically significant ($p < 0.5$).

Table 5 The comparison of the average vital signs before the intervention in the three groups

Vital signs	Reflexology Massage (Mean ± Standard Deviation)	Nonspecific Massage (Mean ± Standard Deviation)	Control (Mean ± Standard Deviation)	Statistical Test	p-Value
Systolic blood pressure	7.56±95.62	1.04±95.02	8.80±95.02	Kruskal-Wallis	0.73
Diastolic blood pressure	5.48±47.77	6.58±47.00	5.37±47.20	Kruskal-Wallis	0.63
Heart beat	13.84±109.90	15.78±106.92	17.02±109.90	Kruskal-Wallis	0.19
RR	2.68±25.12	3.45±26.43	1.29±27.90	Kruskal-Wallis	0.19
Temperature	0.43±36.48	0.43±36.45	1.70±36.19	Kruskal-Wallis	0.93

Table 6 The comparison of average vital signs after treatment in three groups

Vital signs	Reflexology Massage (Mean ± Standard Deviation)	Nonspecific Massage (Mean ± Standard Deviation)	Control (Mean ± Standard Deviation)	Statistical Test	p-Value
Systolic blood pressure	8.16±85.72	11.76±88.85	8.12±96.42	Kruskal-Wallis	0.0001
Diastolic blood pressure	5.10±41.20	7.02±45.75	4.48±49.22 ±	Kruskal-Wallis	0.0001
heart beat	13.67±100.6	96.45±12.82	14.16±110.37	Kruskal-Wallis	0.0001
RR	2.16±22.25	3.26±25.25	25.62±2.62	Kruskal-Wallis	0.0001
Temperature	0.52±36.18	0.52±36.32	0.40±36.50	Kruskal-Wallis	0.01

Table 7 The comparison of the average level of anxiety before and after the intervention in three groups

Anxiety	Reflexology Massage (Mean ± Standard Deviation)	Nonspecific Massage (Mean ± Standard Deviation)	Control (Mean ± Standard Deviation)	Statistical Test	p-Value
Before intervention	1.42± 1.27	1.63±0.94	1.15±1.11	Kruskal-Wallis	0.11
After the intervention	0.63±0.70	0.83±1.05	1.40±2.18	Kruskal-Wallis	0.0001

In the control group, the difference of mean score of anxiety before and after transfusion was statistically significant ($p>0.05$) (Table 4).

Table 5 shows the comparison of vital signs before intervention in the three groups. The findings show that the mean scores of vital signs in three study groups before the intervention are not statistically significant (Table 5).

Table 6 compares the vital signs of the three groups after the intervention. Mean systolic blood pressure in the control group was greater than reflexology massage group and non-specific massage group and the difference was statistically significant ($p=0.0001$). The average diastolic blood pressure before injection in the control group was also greater than the other two groups and revealed a significant difference ($p=0.0001$). The average heart rate in the reflexology massage group and the nonspecific massage was lower than the control group, and the difference was statistically significant ($p=0.0001$). The average number of breathing in non-specific massage group and control group was equal, and the amount was higher compared to reflexology massage group that shows a significant difference ($p=0.0001$). The average temperature in reflexology massage group and non-specific

massage group was lower than the control group, and there was the statistically significant difference between the three groups ($p=0.01$).

Table 7 compares the patients' anxiety in the three groups before and after the intervention. Based on the mean data, the average anxiety in three groups before the intervention had no significant difference ($p=0.11$), but after the intervention, the difference was significant ($p=0.0001$).

DISCUSSION

This study performed aiming to investigate the effect of foot reflexology massage on anxiety and vital signs after blood transfusion in children with thalassemia major. Based on the results a statistically significant difference ($p=0.0001$) was observed between the vital signs of children in reflexology massage group before and after transfusion. In the normal massage group, there was a significant difference ($p=0.0001$) only between systolic blood pressure before and after the intervention. In the control group, patients' vital signs before and after treatment showed no significant difference ($p>0.05$). Before the intervention, the vital signs of patients in the three groups were not significantly

different ($p > 0.05$), while after intervention there was a significant difference between patients' vital signs among the three groups ($p = 0.0001$). The average score of the anxiety of patients in the reflexology massage before and after the intervention ($p = 0.003$) and normal massage before and after the intervention ($p = 0.005$) were significantly different, but the average score of anxiety in control group patients before and after the intervention showed no significant difference ($p = 0.09$). Similarly, before the intervention, the mean score of the anxiety of patients showed no significant difference between the three groups ($p = 0.11$), but after the intervention, the mean score of the anxiety of the patients in the three groups was statistically significant ($p = 0.0001$).

Seyed-Rasouli investigated the effect of reflexology massage on blood pressure and breathing in patients with chronic obstructive pulmonary disease in 2013, and the results showed that massage was effective on systolic blood pressure¹¹ that is consistent with the present study, but no statistically significant effect observed on diastolic blood pressure and breathing. This part of his findings is not consistent with the present study. The reason for this difference could be related to sample size and method of working because in the study by Seyed-Rasouli reflexology massage was performed 30 minutes for 6 weeks. In addition, since children with thalassemia experience, high levels of anxiety during blood transfusion and this procedure can severely affect the physiological indices, the effect of reflexology is probably more tangible in this group of children. Gholami-Motlagh in a study investigated the effect of two methods of Swedish massages on vital signs and the anxiety. He divided the patients into two main groups and performed back, chest and neck massage for one group and face, legs and arm massage for the other group and compared vital signs and anxiety in both groups before and after the massage. The results of his study showed that massage in both groups had a significant effect on systolic blood pressure, diastolic pressure, breathing, heart rate and mean temperature. Moreover, the anxiety scores in both groups were significantly different before and after the intervention. The findings of this study express positive effects of massage therapy on vital signs and anxiety and confirm the results of this study.⁴

The study by Pinar in 2015 revealed that that massage could lead to a significant reduction in systolic and diastolic blood pressure, a number of breathing and heart rate and improved quality of sleeping in patients with cancer.⁷ And these results are also consistent with the results of the present study.

In another study conducted by Peng et al. in 2015, it found that massage can reduce anxiety in cardiovascular patients before the invasive procedure. In addition, blood pressure, heart rate and pain scores in the intervention group were significantly better than the control group.¹ Moyle et al. in the study in 2014 confirmed the effect of foot reflexology on the reduction of systolic and diastolic blood pressure in patients with dementia.⁹ The results of which are consistent with the results of the present study.

Mirzaee et al. in a study in 2008 on nulliparous women, found that reflexology reduced anxiety in the intervention group.²³ Sadat Hosseini et al. in 2010 confirmed the effect of massage on anxiety before invasive procedures in children 7-11 years.¹¹ which the results of these two studies are consistent with the present study. Razmjou et al. in 2011 investigated foot reflexology massage on pain and anxiety in women after elective cesarean section and found that there was a significant difference regarding pain intensity, but reflexology had no effect on the anxiety of patients.²⁴ which reject the results of this study. This difference could be due to differences in sample size, method, and the target group.

In a study by Najafi et al. in 2017, no significant relationship was observed considering the effect of massage on anxiety and pain in patients with burns which is inconsistent with the results of this study, probably this difference is related to the procedure and the samples because the burn patients experience a higher level of pain and anxiety.¹⁰ Eguchi et al. in 2016 conducted a study on Japanese men and women and found that massage can reduce anxiety and improve quality of life, but this anxiety reduction was not significant, while in the present study, reflexology lead to a significant reduction in anxiety.³ So, the study by Eguchi is not consistent with this study.

CONCLUSION

This finding is clinically important in nursing care because stable vital signs and reduced anxiety without the use of medicines is an important care purpose and can decrease complications related to drug proceeds. So, regarding the results of the research on reflexology massage and since training, this technique by nurses to patients and their family is simple and free of cost. In addition to the lack of identifying and reporting complications or adverse effects due to it, the training and use of this method suggested to medical personnel, especially nurses. Moreover, regarding the results of this study, the study of other groups of this case is also recommended.

REFERENCES

1. Pinar R, Afsar F. Back massage to decrease state anxiety, cortisol level, blood pressure, heart rate and increase sleep quality in family caregivers of patients with cancer: a randomized controlled trial. *Asian Pacific Journal of Cancer Prevention*. 2015; 16 (18): 8127-8133.
2. Kasper, D, Fauci, A, Longo, D, Braunwald, E, Hauser, S. & Jameson, J. *Harrison's Principles of Internal Medicine*: 2005.
3. Torabi M, Solati M, Ghahri Saraei N, Pour Esmaeil Z, Akbarian Baghban A. Foot reflex massage and relaxation effect on anxiety and physiological parameters hospitalized patients undergoing angiography. *Scientific Journal of Hamadan Nursing and Midwifery*. 2013; 20 (1): 37- 44.
4. Gholami-Motlagh F, Jouzi M, Soleymani B. Comparing the effects of two Swedish massage techniques on the vital signs of healthy women and anxiety. *Iranian Journal of Nursing and Midwifery Research*. 2016; 21 (4): 402-409.
5. Miri Y, R Fadaei, Izadi S. Lack of awareness about thalassemia major cause of the spread of thalassemia in Zahedan. *East of Iran-South, Hakim*; 2011: 12, 2-21.
6. Tsay SL, Chen HL, Chen SC, Lin HR, Lin KC. Effects of reflexotherapy on acute postoperative pain and anxiety among patients with digestive cancer. *Cancer Nurs*, 2009; 31 (2): 109-115.
7. Eguchi E, Funakubo N, Tomooka K, Ohira T, Ogino K, Tanigawa T. The Effects of Aroma Foot Massage on Blood Pressure and Anxiety in Community-Dwelling Japanese Men and Women: A Randomized Controlled Crossover Trial. *Fukumoto Y, ed. PLoS ONE*. 2016; 11 (3).
8. Pour Ebraheem T. A survey of nursing attitude in relation to thalassemia disease. *Iranian Society of Thalassemia*. 1997; 12: 44-6.
9. Peng S, Ying B, Chen Y, X. Sun Effects of percutaneous coronary intervention receiving massage on the anxiety of patients. *PSYCHIATRIA DANUBINA*. 2015; 27 (1): 44-49.
10. Moyle W, Cooke ML, Beattie E, et al. Foot massage and physiological stress in people with dementia: a randomized controlled trial. *Journal of Alternative and Complementary Medicine*. 2014; 20 (4): 305-311.
11. Sadat Hosseini A, Dehghan-Nayeri N, Mehran A, Z Esmaeil Pour, Azim Zadeh M. Effect of massage on anxiety level before invasive procedures in children. *Journal of Nursing and Midwifery Tehran University of Medical Sciences*. 2010; 16 (3 & 4): 34-43.
12. Vickland V, Rogers C, Craig A, Tran Y. Anxiety as a factor influencing physiological effects of acupuncture. *Complementary Therapies in Clinical Practice*, 2009; 15 (3): 124-128.
13. Ernest E. Is reflexology an effective intervention? A systematic review of randomized controlled trials, 2009; 191 (5): 263-266.
14. Demir Y. *Non-Pharmacological Therapies in Pain Management. Pain Management - Current Issues and Opinions*, 2012: ISBN: 978-953-307-813-7: 485-502.
15. Taylor c, et al. *Fundamental of nursing: the art & science of nursing care*. 2009, 5thed. Philadelphia.
16. S, Kahri, Foot massage in the neonatal intensive care unit effect on vital signs in Tehran. *Tehran University of Medical Sciences Journal of Nursing Faculty of Medical*, 2014: 10 (20): 28-32.
17. International Institute of Reflexology. The nation's leading Authority. Available from: <http://www.reflexology-usa.net/branches.htm>. Accessed September 7, 2012.
18. *Emergency Care*, 11th edition, pp.2002: 226-244.
19. Ghahbeli F, Moheb N, Hoseini Nasab D. Toy and business impact on reducing preoperative anxiety in children before surgery and their parents compared with the treatment process. *Journal Scientific - Tabriz*, 2013; 3 (1): 21-28.
20. Mohamad Pour A, Dehno Alian A, Mojtavavi J. The effect of foot reflexology on physiological parameters of patients with stroke. *Journal Scientific Hamadan Nursing and Midwifery*. 2012; 20 (3): 39-57.
21. Mahmoude Rad GH, Ghaedi M, Bahrami H. The effect of foot reflexology on anxiety in patients undergoing coronary angiography. *Nursing & Midwifery of Journal, Iran University of Medical Sciences*. 2013; 6 (4): 241-248.
22. Salimi T, Shahbazi L, Z Eslami, Pour Dehghan M, The Effect of the mother's vital signs and neurobehavioral outcomes in preterm infants admitted to the hospital. *Journal of Nursing & Midwifery, Iran University of Medical Sciences*. 2009; 22 (6): 85-93.
23. Mirzaei F, Kaviani M, Jafari P. The effect of reflexology on anxiety in nulliparous women. *Journal of Nursing and Midwifery Tehran University of Medical Sciences*. 2010; 16 (1): 65-71.
24. Razm Jou N, Hafizi Lotf Abadi L, Yousofi F, Azizi H, Lotfali Zadeh M. The effect of foot reflexology on pain and anxiety in women after elective cesarean section. *Journal of Obstetrics Gynecology and Infertility*. 2011; 15 (1): 9-17.
25. Albert NM, Gillinov AM, Lytle BW, Feng J, Cwynar R, Blackstone EH. A randomized trial of Massage therapy after heart surgery. *Heart Lung*, 2009; 38 (6): 480-490.



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