

The Effect of Reflexology or Massage Therapy on the Anxiety of Patients Before Coronary Angiography

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ISSN: 2577-2007



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Submission: 📅 December 17, 2018

Published: 📅 May 10, 2019

Volume 5 - Issue 1

How to cite this article: Selma Kahraman* and Yusuf Kizir. The Effect of Reflexology or Massage Therapy on the Anxiety of Patients Before Coronary Angiography. COJ Nurse Healthcare.5(1). COJNH.000604.2019. DOI: [10.31031/COJNH.2019.05.000604](https://doi.org/10.31031/COJNH.2019.05.000604).

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Abstract

Background/Aims: Coronary angiography, which is certain and standard method to diagnose coronary artery diseases increases anxiety of patients. Anxiety may lead to symptomatic cardiac diseases including angina pectoris or acute heart failure. So, nurses play an important role in reducing patient anxiety, fear and stress.: Reflexology and massage therapy are non-invasive methods which decrease anxiety. This study aimed to determine and compare the effect of foot reflexology and massage therapy on the anxiety among patients before coronary angiography.

Materials and methods: Randomized clinical trial study was implemented on 150 patients in Turkey. Data collection was done through face-to-face interviews using two-part questionnaire: Patient Information Form, State /Trait Anxiety Scale. Foot reflexology decreased trait and state anxiety scores.

Result: The state anxiety reduction of foot reflexology was found higher than the trait anxiety reduction of reflexology. The effect of reflexology on anxiety was found higher in woman than in mans. Massage therapy decreased only the state anxiety scores. However, its increased trait anxiety scores.

Keywords: Reflexology; Massage therapy; Coronary angiography; Nursing; Anxiety

Introduction

Cardiovascular diseases are globally leading cause of most of death. According to World Health Organization (WHO) [1] 17.7 million people die each year from cardiovascular diseases. In Turkey, the death rate related to cardiovascular diseases was reported as 39% [2]. The ultimate diagnosis of coronary artery diseases is possible through coronary angiography [2-4]. However, coronary angiography increases anxiety of patients [5-7]. Anxiety is a strong trigger, leads to symptomatic cardiac diseases such as angina pectoris or acute heart failure [8,9]. According to the study by Mikosch et al. [10], 82% of patients' anxiety levels were determined at high levels before coronary angiography operation. Mikosch et al. [10] claimed that coronary angiography caused anxiety, fear and concern.

Nurses play an important role in reducing patient anxiety, fear and stress. Considering anxiety complications, this is an especially important skill for cardiovascular nurses [11,12]. Generally, nurses can attempt to reduce anxiety of patients by giving accurate information about the intervention. Recently, it seems that non-invasive, complementary and alternative medicine may be a solution to reduce anxiety, stress or pain [12].

Reflexology is one of non-invasive, complementary and alternative medicine methods used in various clinical circumstances. It is classified as one of the four methods called manipulative and body-based applications by the National Center for Complementary and Integrative Health (NCCIH) [13,14]. Reflexology is based on the stimulation of reflex points on the feet, hand, face and ears. These points correspond to all areas, organs and systems within the body. The stimulation of reflex points could relax and balance the body. In several studies conducted on different patients, effectiveness and positive results of reflexology have been reported. Its relaxation impact is considered as its positive dimension [14-16]. Reflexology cannot be applied to reduce the level of anxiety in patients hospitalized in hospitals in Turkey.

Also, some studies reported that reflexology does not have distinct effect on heart rate, blood pressure and have a limited effect on the cardiovascular system [17,18]. Therefore, more studies about reflexology are needed [12].

Another non-invasive, complementary and alternative medicine is massage therapy that is the stimulation of soft tissues of the body by the hand through mechanical methods. Peripheral receptors on the skin are stimulated and these stimulations reach the brain via the spinal cord through massage therapy. Besides a feeling of pleasure, general relaxation is acquired during a massage therapy. Massage therapy is effective on the blood and lymph circulation, relaxation of muscles and dilation on arterioles [19,20]. Like reflexology, massage therapy cannot be applied to reduce anxiety of patients in Turkey.

In the literature, the effects of reflexology or massage therapy on anxiety of patients before coronary angiography are investigated individually [5,7,8,11,13]. The purpose of this study is to determine and compare the effects of reflexology and massage therapy methods on the anxiety among patients before coronary angiography. To the best of our knowledge, the present paper represents the first report that compares the effects of reflexology and massage therapy on the anxiety of patients before coronary angiography. In addition, this study is aimed to find out the effects of reflexology and massage therapy on not only the anxiety of male patients but also those of female patient's contrary to some studies [13].

Methods

The randomized clinical trial research was conducted on patient candidate for angiography in the Coronary Intensive Care Clinic at Mehmet Akif Inan Education and Research Hospital (Şanlıurfa, Turkey) between March-September 2015. The sample size was estimated at 50 patients per group based on the results obtained by Vardanjani et al. [13]. (the power of the test was calculated as 0.99 for $\alpha=0.05$). In total, 150 patients were randomly allocated to reflexology massage therapy, control group. Inclusion criteria were: willingness to participate in the study, candidate for angiography procedure for the first time, without history of anxiety or mental illness, without myocardial infarction diagnosis, not having acute infection, surgery or open wound, fever, not pregnant. Exclusion criteria were inability to communicate well, unconscious patients.

Permission and ethical approval obtained from Mehmet Akif Inan Education and Research Hospital and Harran University respectively. Data collection was done through face-to-face interviews using two-part questionnaire. The first part of the questionnaire was Patient Information Form. This form was composed of 15 questions related socio-demographic information including identity, age, gender and the information about diagnosis and history of coronary angiography. The Patient Information Form was prepared in accordance with the relevant literature [9,13,16,21]. The second part of this questionnaire was composed of State /Trait Anxiety Scale. It was developed by Spielberger et al. [22], adapted into Turkish by Öner and Le Comte (1977). Oner and Le Comte (1977) standardized and tested the reliability and

validity of this scale. The State/ Trait Anxiety Scale was consisted of 20 items describing subjective feelings associated with stressful situations [22,23]. For state anxiety scale, each answer had four options which changed between 1=Not at all and 4=Very much so. Similarly, each answer of trait anxiety scale had four choices which changed between 1=Almost never and 4= Almost always. The total score obtained from the answers of second form, ranged from 20 to 80. The higher the total score, the greater the anxiety.

Firstly, subject, purpose and method of the study were explained to the patient in the study. In the case of his/her willingness to participate, informed consent of entering the study was taken from all patients. Patients were informed that they may withdraw from the study at any part, if they did not want to continue. Based on the "Autonomy" principle, information shared by patients would not be shared by any party and would be protected. Then patients were randomly allocated to reflexology, massage therapy and control groups and the questionnaire were filled by patients in all groups. After the patients in control group rested for ten minutes, the questionnaire was filled again. Massage therapy was applied to left foot of patient. The certified nurse greased his hands with some olive oil. After foot warming exercises, massage therapy was applied using one or two of methods such as rotation, stretching the Achilles tendon, relaxing the ankle from both-sides and walking the thumbs beneath the foot and squeezing through ten minutes. The questionnaire was completed after 10 minutes. Like massage therapy, foot reflexology was applied to left foot of patient.

As in massage therapy, the certified nurse greased his hands with some oil. Firstly, warming exercises were performed. Then reflexology was implemented from the top of feet to the bottom of feet for ten minutes. Specialized reflexology was done through the pressure point of foot correspond to the brain (Hypophysis, Hypothalamus, brain and pineal gland point and medulla spinalis). Finally, pressure was applied on the solar plexus. After ten minutes the questionnaire was filled by patient.

Data analysis was done by SPSS16 software and $p<0.01$ was considered statistically significant. Shapiro and Kolmogorov-Smirnov tests were used to determine whether scale total scores were normally distributed. Socio-demographic characteristics of patients were taken as independent variables; scale total scores were taken as dependent variables. Paired t test is used for comparing the mean of anxiety scores in the two groups.

Result

Table 1 shows the socio-demographic characteristics of the patients. The nearly half of control group and the majority of reflexology and massage groups were male. The majority (68%) of the reflexology group and nearly half of the massage therapy and control group were aged ≤ 60 years. Half of reflexology and majority of massage therapy and control groups were illiterate. The majority of patients in all three groups were unemployed and married (Table 1). These results show that the patients in all the three groups are homogeneous groups.

Table 1: Socio-demographic characteristics of patients.

Methods		Reflexology		Massage Therapy		Control	
		n	%	n	%	n	%
Gender	Male	28	56	32	64	24	48
	Female	22	44	18	36	26	52
Age	≤60 years	34	68	24	48	24	48
	>60 years	16	32	26	52	26	52
Education	Illiterate	25	50	34	68	39	78
	Primary School	18	36	11	22	8	16
	Secondary and after	7	14	5	10	3	6
Job	Unemployed	15	30	18	36	24	48
	Employee	13	26	10	20	1	2
	Farmer	13	26	15	30	22	44
	Others	9	18	7	14	3	6
Marital status	Married	44	88	45	90	43	86
	Single	6	12	5	10	7	14

The State /Trait anxiety scores are shown in Table 2. Only reflexology decreased the trait anxiety scores of patients (47.3±7.8 to 46.2±8.3) (Table 2). Unlike control group, state anxiety scores decreased with reflexology and massage therapy ($p<0.01$) (Table

2). Besides, post-test state anxiety score of reflexologies (34.4±9.3) were determined as smaller than the score of massage therapy (37.8±9.8).

Table 2: State and Trait Anxiety Scores*

Methods	Reflexology	Massage Therapy		Control		
		p		p		
Pre-Test Trait Anxiety	47.3±7.8	<0.001	45.5±9.1	<0.001	43.8±6.0	0.261
Post-Test Trait Anxiety	46.2±8.3		46.2±9.2		44.1±5.7	
Pre-Test State Anxiety	42.9±11.1	<0.001	40.1±9.7	<0.001	43.02±7.9	<0.001
Post-Test State Anxiety	34.4±9.3		37.8±9.8		46.3±6.8	

*Paired t test, $p<0.01$ was considered statistically significant.

Pre- and post- anxiety scores arranged according to socio-demographic characteristics of the patient are presented in Table 3. As shown in Table 3, pre-test trait anxiety scores of female patients were higher than those of male patients in all groups. Trait anxiety scores remained as nearly same with time for female patients in control group. However, these scores increased with time, for male patients in control group (Table 3). As for massage therapy, it did not affect the trait anxiety scores of female patients. However, massage therapy increased trait anxiety score of male patients. Although reflexology decreased trait anxiety scores of males (44.6±4.8 to 43.2±4.6) and female patients (50.7±6.2 to 49.7±6.3), the decrease in trait anxiety scores (0.018) of female experienced with reflexology was statistically significant ($p<0.01$).

State anxiety scores of female patients were higher than those of male patients similar to trait anxiety scores of females. State anxiety scores, statistically significant, increased with time in

control group (Table 3). Massage therapy did not cause any change in the state anxiety scores of males. On the other hand, the state anxiety scores of female groups (41.8±3.7 to 42.1±4.0) increased with massage therapy. This increase was not statistically significant ($p<0.01$). Lowest state anxiety scores were obtained in both female (40.1±10.8 to 35.7±9.6) and male reflexology groups (46.3±10.7 to 33.3±9.1) ($p<0.01$).

When the trait anxiety scores were examined according to education status, reflexology decreased the trait anxiety score of illiterates (51.7±4.8 to 50.8±4.5) and primary school (41.5±6.8 to 40.2±6.4) ($p<0.01$) (Table 3). Massage therapy decreased the trait anxiety score of secondary and after education group (50.3±6.4 to 48.6±5.4). However, this difference was not statistically significant. This score decreased in primary education group and secondary and after education group in control group with time. When the state anxiety scores were examined according

to education status, reflexology lowered the scores in all groups except in secondary and after education group which was statistically significant (Table 3). Unlike the state anxiety scores of primary school education group (42.5±4.9 to 41.2±3.7), those of

other groups increased with massage therapy. Nevertheless, the difference was found not significant (Table 3). For control group, post-test scores were higher than pre-test scores.

Table 3: Socio-demographic Characteristics of Patients and Trait (a) and State (b) Anxiety Scores*.

Socio-Demographic Characteristics	Reflexology			Massage Therapy			Control		
	PreX±SD	Post X±SD	p	PreX±SD	Post X±SD	p	Pre-X±SD	Post X±SD	p
Gender (a)									
Male	44.6 ±4.8	43.2±4.6	0.054	48.7±5.0	49.2±4.7	0.146	41.5±4.3	42.2±4.0	0.285
Female	50.7±6.2	49.7±6.3	0.018	50.7±4.4	50.8±4.8	0.644	45.9±6.6	45.8±6.4	0.77
Gender(b)									
Male	40.1±10.8	33.3±9.1	0.005	41.7±4.5	41.7±3.5	0.931	40.1±6.3	44.2±5.8	0
Female	46.3±10.7	35.7±9.6	0	41.8±3.7	42.1±4.0	0.781	45.6±8.4	48.2±7.1	0.002
Education (a)									
Illiterate	51.7±4.8	50.8±4.5	0.026	49.8±4.8	50.3±4.6	0.033	44.5±4.0	44.7±5.8	0.21
Primary School	41.5±6.8	40.2±6.4	0.013	49.0±4.9	49.3±5.4	0.676	40.2±4.0	39.6±2.5	0.351
Secondary and after	46.2±6.8	46.4±8.2	0.877	50.3±6.4	48.6±5.4	0.3	44.5±6.3	43.6±4.0	0.258
Education (b)									
Illiterate	46.5±8.1	32.5±6.8	0	41.4±4.1	41.9±3.8	0.278	43.87±8.7	48.6±6.1	0
Primary School	36.4±15.9	30.5±9.1	0	42.5±4.9	41.2±3.7	0.555	38.50±5.7	39.7±5.5	0.451
Secondary and after	46.4±10.2	32.5±9.0	0.051	41.3±2.8	42.3±2.3	0.667	44.0±9.84	47.5±6.1	0.034

Discussion

In this study the effect of reflexology and massage therapy were investigated on anxiety of patients undergoing coronary angiography. The finding showed that reflexology significantly decreased the state and trait anxiety of patients. Unlike reflexology, massage therapy increased trait anxiety. Both reflexology and massage therapy were effective on state anxiety of patients, but the effect of reflexology was more apparent. Both the post-test trait and state anxiety scores of patients in control group were found higher than pre-test scores. In addition, the increase in state anxiety scores of control group was found statistically significant. Trait anxiety scale generally defines how an individual feel.

independent of circumstances and conditions. So, trait anxiety level reflects lifestyle, personality characteristic as well as current state. The theory of state/trait anxiety suggests that state anxiety level may change with stressful life event such as angiography, unlike trait anxiety [13]. Our findings support this theory [10,12,13,17,22]. In the study by McViar et al. [24], reflexology caused a statistically significant decrease in state anxiety scores. However, it did not cause any statistically significant decrease in trait anxiety scores. According to our findings, reflexology caused a statistically significant decrease in both state and trait anxiety scores.

Heidari et al. [25] reported that hand reflexology significantly reduced state anxiety scores among patients before coronary angiography. However, hand reflexology did not cause any significant differences in trait anxiety. In this study, we showed

that foot reflexology significantly reduced not only state anxiety scores but also trait anxiety scores. Mahmoudirad et al. [7] also found a decrease in anxiety of patients undergoing coronary artery angiography when they were applied foot reflexology. These findings were consistent with ours, in that reflexology reduced the level of anxiety.

Reflexology, which was practiced on only male patients by Vardanjani et al. [13], reduced the anxiety of patients undergoing coronary angiography. On the contrary, our study that was applied both on male and female patients revealed that reflexology decreased the anxiety of both groups. We revealed that the anxiety scores of female patients were more than those of male patients before angiography. Reflexology reduced the trait and state anxiety of female patients as same as the anxiety of males. Besides, the effect of reflexology on anxiety was found higher in woman than in mans. This finding was consistent with the finding of the study by Taghizadeh et al. [4].

Interestingly and conversely, massage therapy increased the anxiety of female patients. Our study also investigated the effects of reflexology and massage therapy according to education state. Except in secondary and after education level, reflexology decreased the trait anxiety. Besides, state anxiety decreased in all education levels. These results are the first for literature as far as we know.

Limitation of the Study

The major limitation of the current study was that most of patients were illiterate and the questionnaire was filled by researchers.

Impact Statements

This study underlines the importance of anxiety decreasing methods before coronary angiography. This study clarifies the effects of reflexology and massage therapy on the anxiety of patients undergoing coronary angiography. In addition, this study reveals that reflexology is better than massage therapy.

Conclusion

Our study clarified that foot reflexology had a positive effect on trait and state anxiety of patients compared to massage therapy. The state anxiety reduction of foot reflexology was found higher than the trait anxiety reduction of reflexology. The effect of reflexology on anxiety was found higher in woman than in mans. Massage therapy decreased state anxiety scores. However, its increased trait anxiety scores. Nurses should be aware of harmful effects of anxiety, also to cope with it. In this sense, nurses may incorporate reflexology into their care. However, further research may be required to determine the effects of reflexology on the anxiety of patients with different diseases or at different time intervals.

Acknowledgement

The authors thank the patients who agreed to participate in this study for their effort and contribution.

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