

Comparison of the Effects of Foot and Hand Reflexology Massages on Stress and Anxiety in Candidate Patients Undergoing Upper Gastrointestinal Endoscopy

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ABSTRACT

Background and Objective: gastrointestinal diseases are common disorders and endoscopy is the most important diagnostic method for these disorders. Due to the aggressiveness, endoscopy causes stress and anxiety in patients. Stress and anxiety prior to endoscopy reduced willingness of the patients to undergo endoscopy and increased the time of endoscopy. The present study aimed to compare the effects of hand and foot reflexology massages on stress and anxiety in candidate patients undergoing upper gastrointestinal endoscopy.

Materials and Methods: This study was designed as a single-blind randomized controlled clinical trial. Endoscopy was performed on 95 patients. Hand and foot reflexology massages were performed for 20 minutes prior to endoscopy in intervention groups. Stress and anxiety levels prior to intervention and immediately prior to endoscopy were measured in the three groups. Depression Anxiety Stress Scales (DASS-21) was used to collect the required data.

Results: The results showed a statistically significant difference between intervention and control groups in terms of demographic variables prior to intervention ($p > 0.05$). A significant reduction was observed in mean and standard deviation of stress and anxiety in hand and foot reflexology massage groups ($n=30$) compared to control ($n=35$) before intervention and immediately prior to endoscopy ($p < 0.0001$).

Conclusion: Implementation of reflexology massage in the patients undergoing endoscopy can reduce stress and anxiety prior to this diagnostic method. Thus, either hand reflexology massage or foot reflexology massage (a non-pharmacological, low-cost and unaggressive method) was used to reduce stress and anxiety of the patients before performing aggressive diagnostic procedures by taking into account willingness of the patients according to similar effect of hand and foot reflexology massages.

Keywords: Reflexology; Endoscopy; Anxiety; Stress.

INTRODUCTION

Various diseases especially stress-related diseases are more prevalence nowadays than in the past among which gastrointestinal diseases can be mentioned¹. Gastrointestinal cancer is a major cause of mortality in the world. Gastric cancer is the second global leading cause of death resulting from malignant tumors. Esophageal cancer is the fifth leading cause of death². Gastric cancer is the most common disease among men and the third common disease among women after breast and colorectal cancers in Iran^{3,4}. Early diagnosis of gastrointestinal cancers can significantly increase longevity of the patients and reduce treatment costs. Diagnostic methods for gastric diseases are widely progressing. Endoscopy is a diagnostic aggressive method^{1,5}. Esophagogastroduodenoscopy (EGD) is a common and an important diagnostic and

therapeutic method for assessment and examination of the upper gastrointestinal tract. Evidence shows that more than thousand cases of upper gastrointestinal endoscopy are performed in a medical center equipped with endoscopy unit. Various studies have shown that 86% of the people in different societies require upper gastrointestinal endoscopy⁶. Endoscopy is studied in clinical trials due to obvious diagnostic advantages and therapeutic use of this method⁷. However, this method causes high levels of stress and anxiety in the patients⁵. Anxiety is a fundamental problem of the patients waiting for diagnostic procedures⁸. Unknown anxiety leads to stress⁹. In general, the patients waiting for endoscopy are usually anxious¹⁰. Late referring to the hospital due to anxiety of malignant disease or fear of the side effects relevant to diagnostic procedures (especially endoscopy) delay diagnosis and impose heavy

costs on the patients. In fact, endoscopy-causing anxiety is a serious problem in the patients who visit the centers for gastrointestinal diseases, diagnosis and treatment¹¹. On the other hand, anxiety reduces the patient's tolerance and cooperation during endoscopy. As anxiety of the patients increases, the time of diagnosis and the number of complications increases. As a result, the possibility of satisfactory results decreases¹². The number of anxious people undergoing endoscopy is increasing day by day. Necessary measures should be adopted to resolve stress and anxiety of the patients¹³. Various pharmacological and nonpharmacological methods are used to cope with and control anxiety. Benzodiazepines, selective serotonin reuptake inhibitors, tricyclic antidepressants are typical tranquilizers used to relieve anxiety¹⁴. However, tranquilizers cause various complications. For example, treatment costs increase from 30% and 50%, more time is needed for relief and recovery and more personnel is needed to care for affected patients. There are some reports on life-threatening complications during endoscopy following intake of tranquilizers¹⁵. On the other hand, there are various safe drug-free methods to reduce anxiety prior to aggressive diagnostic methods¹⁶. For example, various complementary and alternative treatment methods are used by nurses to promote health of the patients. Reflexology massage intervention is a complementary and alternative manual treatment, which provides opportunities for nurses to care for the patients¹⁷. So far, many studies have investigated reflexology massage as a unaggressive nursing intervention in various situations among which improved anxiety in cancer patients, reduced blood pressure, reduced depression, improved immune function and reduced fatigue in pregnant women can be noted¹⁸. Non-pharmaceutical therapeutic interventions are used by the nurses who are the most important team members with important roles in preserving health and saving lives of their patients¹⁹. Nurses help to relieve anxiety²⁰. This is because stress has a great impact on the patient's condition and clinical results. Therefore, this type of therapy manifests the art of nursing professional^{21,22}. On the other hand, evidence shows the growing need for endoscopic and colonoscopy diagnostic procedures. Therefore, it is essential to make appropriate decisions and use unaggressive and non-pharmaceutical relaxation methods to provide maximum assistance to the patients²³. Hand and foot reflexology massages have different impacts on the patients undergoing endoscopy with high levels of stress and anxiety. So far, the effect of reflexology and superiority of hand reflexology massage over foot reflexology massage are not studied in this group of patients. This study helps to improve performance of the nurses.

MATERIALS AND METHODS

This study was designed as a single-blind (before the intervention - after the intervention) randomized controlled clinical trial. The study was conducted on 95 endoscopic candidate patients who visited the Polyclinic in 22-Bahman Hospital in Nishapur. Using adequacy of the sample size formula, 30 patients were selected for foot

reflexology massage, 30 patients for hand reflexology massage and 30 for control. A demographic questionnaire and Depression Anxiety Stress Scales (DASS-21) were used to collect the required data. Depression Anxiety Stress Scales contain 21 items, which are scored as follows. Each subscale of stress, anxiety and depression (DASS-21) is a self-report questionnaire designed and developed by Loewy in 1995²⁴. The scale evaluates three psychological states of anxiety, depression and stress. The scale contains various items relevant to signs and symptoms of depression (7 items), anxiety (7 items) and stress (7 items). The questionnaires were filled out by the patients. Each question was scored as not at all (0), low (1), medium (2) and high (3). Total acquired scores by the patients estimate levels of depression, anxiety and stress. Psychometric characteristics of this questionnaire was evaluated by Afzali *et al.* in Iran in 2007. They studied 40 high school students and approved the questionnaire. The findings of the former study showed correlations of depression scale in this test with the Beck Depression Inventory test (0.849). Zung anxiety test (0.831) and Stress Inventory (0.757). Alphas for depression, anxiety and stress were respectively as 0.94, 0.85 and 0.87²⁵. Get the questionnaire from Sepehri and Samani in Mehkarsa and register for Edaz and related code. The questionnaire was also evaluated by Neil in 2006. Alphas for depression, anxiety and stress were respectively reported as 0.89, 0.84 and 0.68. It should be noted that only two subscales of stress and anxiety were assessed in this study²⁶. The ethics committee approved the sampling procedure. For this purpose, the author visited the Polyclinic in 22-Bahman Hospital in Nishapur. Names of candidate endoscopic patients who had visited the clinic in the previous day were prepared. Informed consent forms were distributed among the patients. Objectives the study were explained to the patients. Then, eligible individuals were selected for the study based on inclusion criteria. Inclusion criteria was as follows: a prescription for upper gastrointestinal endoscopy, aged from 18 to 60, capability to speak and understand Persian, no sign of deafness and vision impairment, no history of endoscopy, no prescription for emergency endoscopy, no history of mental illness, not using opium, no intake of tranquilizers, Iranian nationality, no history of neuropathy diseases such as diabetes and myasthenia gravis. Exclusion criteria was as follows: a history of psychological problems or known anxiety disorders, using hypnotics and tranquilizers, having severe pain due to nature of the disease (e.g. cancer), drug addiction or addiction to strong painkillers, no willingness to cooperate in the study, loss of a relative at the time of the project and stressful events except endoscopy in the last month (such events as marriage, divorce, death of a close relative, loss of job, immigration and severe accident). Sampling procedure was as follows. The author visited the Polyclinic in 22-Bahman Hospital. Informed consents of the patients were obtained. Eligible individuals for the study were selected based on inclusion and exclusion criteria. The selected individuals were randomly assigned to the three groups of control, hand reflexology massage and foot reflexology massage. Demographic

Table 1: Comparison of mean anxiety before and after intervention in the intervention and control groups.

Group	Control	Foot	Hand	Significance level (P-value)
Before intervention	9.77 (8.21)	24.13 (11.53)	24.33 (12.26)	0.0001
After intervention	20.34 (11.15)	11.47 (8,13)	11.80 (7.80)	0.001
Change% from before intervention to after intervention	171.72	-57.18	-54.88	0.0001
p-value for changes before and after intervention	<0.0001	<0.0001	<0.0001	

Table 2: Comparison of mean stress before and after intervention in the intervention and control groups.

Group	Control	Foot	Hand	Significance level (p-value)
Before intervention	12.40 (8.99)	28.33 (10.75)	29.13 (10.97)	0.0001
After intervention	23.08 (10.77)	12.13 (7.79)	14.73 (8.68)	0.0001
Change% from before intervention to after intervention	163.79	-59.40	-54.95	0.0001
p-value for changes before and after intervention	<0.0001	<0.0001	<0.0001	

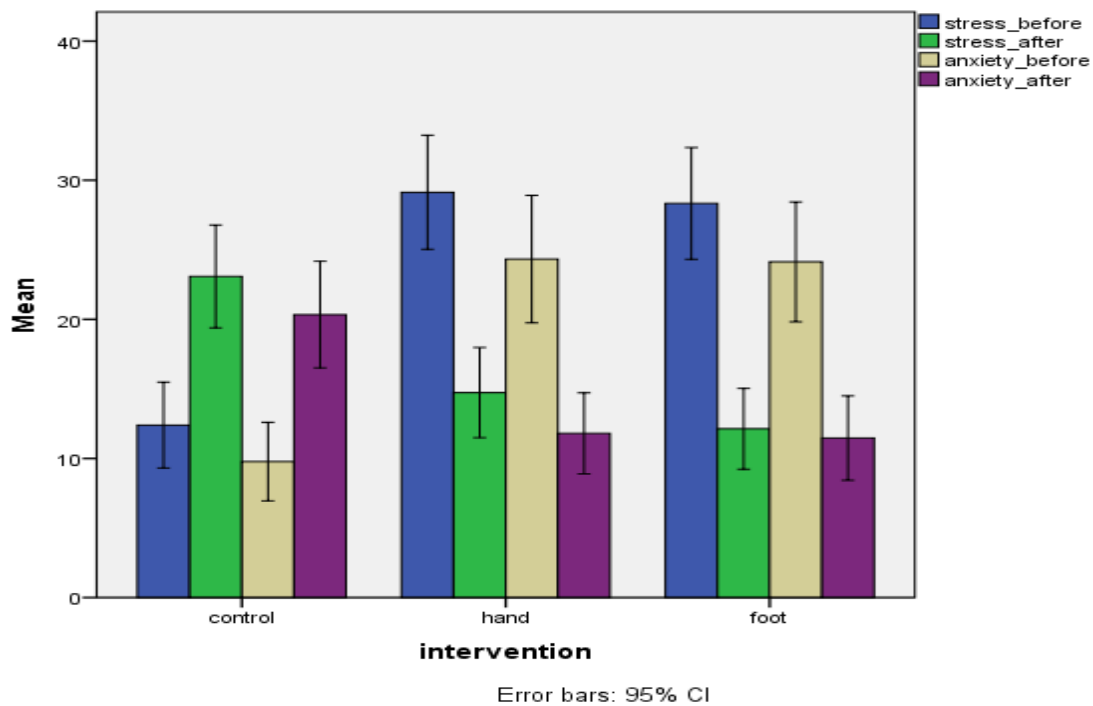


Figure 1: Mean comparison and 95% confidence interval for anxiety and stress among the three groups before and after intervention.

questionnaires were completed by the patients. The author gave necessary explanation about stress and anxiety scales and determinants of severity of anxiety and stress to the patients. Then, the patients were asked to mark their levels of stress and anxiety in the questionnaires before the intervention. It is necessary to mention that the scales of stress and anxiety were filled out by the patients immediately before endoscopy. The intervention involves hand and foot reflexology massages conducted by the author and his assistant. Reflexology massages were

performed in the hospital by the authors as follows. Half an hour before endoscopy, the patient was placed in supine position. Prior to main techniques, general massages to warm the hands and feet were performed for one minute. Then, reflexology massages were performed for the head, pituitary gland, diaphragm, lung and kidney / adrenal in the experimental groups for 10 minutes on the hands and feet. The locations of the reflection points in different organs were as follows: the head was the base of the thumb upwards, in the pituitary gland was the center pad of the

thumb tip, in the diaphragm was along diaphragmatic belt, in the lung was along horizontal lines of the fingers and in the kidneys was inside the edge of large pad at the base of the thumb²⁷. It should be noted that the steps, time and location of reflexology massage for the foot were the same as the ones for the hand. In this study, the required data was collected from the three groups in two stages (before intervention, after intervention). The required data was collected by the author and a research assistant. SPSS version 19 was used for statistical analysis. Chi-square test, Kruskal-Wallis and Wilcoxon tests were used in order to compare and find the exact relationship between studied variables. The significance level was considered as 0.05 for all tests.

RESULTS

The findings indicated no difference between the patients in intervention and control groups in terms of demographic variables using Chi-square test ($p > 0.05$). There was a significant difference between anxiety scores in intervention and control groups before the intervention using Kruskal-Wallis and Wilcoxon tests ($p = 0.0001$). There were statistically significant differences between anxiety scores in the groups after the intervention ($p = 0.0002$). The anxiety score was significantly increased by 171% after the intervention in the control ($p < 0.0001$). Anxiety scores were also significantly decreased in the hand and foot reflexology massage groups by 54.88% and 57.18% respectively after the intervention ($p < 0.0001$). Comparison of anxiety scores in the three group showed significant differences between anxiety scores in control compared to experimental groups. However, no significant difference was found between anxiety scores in hand and foot reflexology massage groups. Thus, both foot and hand reflexology massages similarly improved anxiety in the patients (Table 1). There was also a significant difference between stress scores in the intervention and control groups before intervention ($p = 0.0001$). There were also significant differences between stress scores in the groups after the intervention ($p = 0.0001$). Stress scores were significantly increased after the intervention in the control by 163% ($p < 0.0001$). Stress scores were significantly decreased in hand and foot reflexology massage groups after the intervention by 54.95% and 59.40% respectively ($p < 0.0001$). Comparison of stress scores in the three group showed a significant difference between stress scores in hand and foot reflexology massage groups compared to control. However, no significant difference was found between stress scores in hand and foot reflexology massage groups. Thus, both hand and foot reflexology massages improved stress in the patients (Table 2).

DISCUSSION

The results suggested that mean severity of stress and anxiety has decreased in the hand and foot reflexology massage groups immediately before endoscopy. Simultaneously, stress and anxiety have increased in the control group. Findings from several studies indicated that reflexology massage reduces stress and anxiety in a variety of conditions. Mahmoudi Rad *et al.* (2014) confirmed this

issue. They studied the effect of foot reflexology massage on anxiety of candidate patients undergoing coronary angiography. They showed that foot reflexology massage significantly reduces anxiety in this group of patients²⁸. Ebadi *et al.* (2014) studied the effect of foot reflexology massage on anxiety and restlessness in mechanically ventilated patients after open heart surgery. They showed that foot reflexology massage can reduce anxiety and restlessness in the patient. These results are consistent with the results of the present study²⁹. La-Ongda studied the effect of reflexology massage in reducing stress in adolescent mothers in postpartum period in 2010 in Thailand. In the former study, stress levels and physiologic indices were monitored five minutes before and 24 hours after the intervention. The findings showed that foot reflexology massage can reduce stress and physiological indices³⁰. Hooks *et al.* (2011) studied the effect of foot reflexology massage on autonomic nervous system in healthy individuals to evaluate the use of an experimental method for determining physiological effects of reflexology massage on stress. In the former study, 26 healthy Irish individuals participated in the intervention. The results showed that blood pressure was decreased during mental stress after reflexology massage compared with stress before the intervention in the experimental group³¹. Gonar Sadutir *et al.* studied the effect of foot reflexology massage on anxiety in the patients undergoing coronary artery bypass surgery. The results showed that foot reflexology massage does not reduce anxiety. These results are not consistent with the results of the present study. This may be due to small sample size ($n = 9$, 5 individuals in the experimental group and 4 individuals in the control). Anti-anxiety medication was not also included in the exclusion criteria. This medication reduces anxiety in some patients. However, anti-anxiety drugs were included in the exclusion criteria in the present study³². There are limited studies on reflexology massage. Hudson *et al.* (2015) studied the effect of hand reflexology on pain, anxiety and satisfaction during surgery with minimal aggression under local anesthesia. They showed that hand reflexology massage can reduce anxiety and shorten the period of pain compared to patients who receive usual care³³. Most studies have shown that reflexology massage can cause a feeling of deep relaxation, balance mind and body and reduce stress-related symptoms. Many people express their happiness after reflexology massage. In addition to the above-mentioned mechanisms, this intervention causes a positive patient-nurse relationship and reduces stress and anxiety in the patient¹⁸. Finally, the findings of this study indicated the efficacy of hand and foot reflexology massages on stress and anxiety of candidate patients undergoing endoscopy. Considering the effectiveness of hand and foot reflexology massages in stress and anxiety of candidate patients undergoing endoscopy and according to ease of use and low number of side effects, this intervention can be used as an effective method to reduce stress and anxiety in the patients. By taking into account the same effect of hand and foot reflexology massages, nurses can use this

method as a non-pharmacological intervention to reduce stress and anxiety in the patients.

CONCLUSION

The findings showed that hand and foot reflexology massages can be used as a medication-free, simple and unaggressive therapy to reduce stress and anxiety of the patients. Therefore, it is recommended to use hand and foot reflexology massages to reduce stress and anxiety in candidate patients undergoing upper gastrointestinal endoscopy.

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