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The Effect of Reflexology versus Stroke Massage on Respiratory Symptoms in Patients with Bronchial Asthma

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Abstract

Background: Bronchial asthma is a common chronic disease in adults. The lack of definitive treatment caused the patients with bronchial asthma to look for non-pharmacological interventions. One of these interventions is massage therapy.

Aim: The present study was conducted with aim to compare the effect of reflexology versus stroke massage on respiratory symptoms in patients with bronchial asthma.

Method: This randomized controlled clinical trial study was conducted in 2020 on 120 patients with bronchial asthma referred to Shahid Muftah Clinic of Yasuj city. The participants were selected through non-probability sampling method and randomly assigned to three equal groups: reflexology, stroke massage, and control (n=40). Four sessions of interventions were performed. Respiratory symptoms were assessed using pulse oximetry, stethoscope, observation and respiratory exam before and after the interventions. Collected data were analyzed by SPSS software (version 21) and Chi-square and one-way analysis of variance (ANOVA) tests. $p<0.05$ was considered statistically significant.

Results: There was no significant difference among three groups in terms of mean score of arterial oxygen saturation ($p=0.148$) and respiratory rate ($p=0.520$) after the interventions. However, there were significant differences among three groups regarding mean score of respiratory symptoms, including daily cough ($p=0.012$), nocturnal cough ($p=0.007$), exertional dyspnea ($p=0.034$), exertional cough ($p=0.024$), and limited activity ($p=0.037$). These differences were observed between the two interventions groups and the control group, however, no significant differences were observed between the two intervention groups.

Implications for Practice: Reflexology and stroke massage could similarly reduce respiratory symptoms of patients with bronchial asthma.

Keywords: Asthma, Massage, Reflexology, Respiratory Symptoms, Stroke

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Introduction

Asthma is one of the most common respiratory diseases which is rapidly spreading worldwide (1). Today, there are approximately 300 million asthma patients worldwide and this rate will reach to 400 million by 2025 (2). Various factors are involved in the occurrence of asthma, including family history as the most common factor, genetics, smoking, diet, occupation, microbiome, air pollution and agricultural environments (3,4). Based on severity, the disease is divided into four categories: intermittent, mild persistent, moderate persistent, and severe persistent (5). This disease causes bronchial hyper-responsiveness, mucus hypersecretion, inflammation and airway narrowing, which results in wheezing, breathlessness, and chest tightness in the affected people (6). Also, persistent or repeated inflammation of the airways may lead to airway structural changes such as epithelial hyperplasia and metaplasia, changes in mucus-secreting cells, sub-epithelial fibrosis, and muscle cell hyperplasia (7).

Treatment of asthma is a step-by-step approach based on controlling the patient's symptoms. Pharmacological and non-pharmacological treatments are used to treat the disease (8). One of the methods used to improve breathing in these patients is breathing techniques, which can be performed in the form of aerobic exercises, breathing techniques such as tai chi, yoga, hypnosis, boutique (9,10). The complementary medicine methods are also used for the treatment of asthma. The use of massage is one of the therapeutic methods of complementary medicine (11). Reflexology is one of the types of massages (12). Reflexology includes applying pressure to the feet, hands or ears with the fingers without using oil. Reflexology therapists claim that each system of the body reflects its image on the hands and feet, and the effect of massaging the feet, hands, and ears in the reflex areas of those organs conveys a physical change to that organ (13). In fact, foot reflexology is a unique type of massage which puts pressure on the toes and affects the physiological response of the body (14). There are also other forms of massage, such as back stroke. This type of massage is performed using slow, gentle and balanced movements of the palms on patient's back at a uniform speed. These movements have a completely sensory effect and are very useful in calming patients (15). Back stroke affects the parasympathetic nerve through the hypothalamus and reduces heart rate, blood pressure, metabolism, breathing rate, and oxygen consumption (16). The results of a study by Abedini et al. showed that reflexology could improve the quality of sleep in colorectal cancer patients (17). Also, Dashti et al. in their research indicated that reflexology with olive oil can be effective in controlling asthma symptoms (18). Moreover, the effects of deep breathing and gentle back stroke for reducing blood pressure have been proven (19). Another study also showed that hand and foot stroke massage can be a useful nursing intervention in reducing anxiety and improving vital signs in patients (20).

Considering that asthma is a chronic disease, it can have a great impact on the quality of life of patients. On the other hand, the recurrence of attacks causes frequent visits of patients and consequently their hospitalization. Touch therapy has always been a part of nursing care, and today reflexology and stroke have also been used, and these methods are a way to increase the relationship between nurse and patient. Therefore, in case of significant effect of these treatment methods, it is possible to prevent the unnecessary use of drugs and as a complementary treatment method along with other treatment methods, without spending costs which is done by the patient himself. Therefore, the present study was conducted with aim to compare the effect of reflexology massage and stroke on respiratory symptoms of patients with bronchial asthma.

Methods

This randomized controlled clinical trial study was conducted on 120 patients with bronchial asthma referred to Shahid Muftah clinic of Yasuj city in 2020. Sample size was calculated based on similar studies (21,22) and using the statistical formula and considering α=0.05 and β=0.2. The eligible participants were selected through non-probability sampling, however, they were randomly assigned to one of the three equal groups; reflexology (n=40), stroke massage (n=40), and control (n=40) via block randomization. This block randomization process used permuted blocks of size three to assign patients at a ratio of 1:1:1 to each of the three groups (Figure 1). Inclusion criteria were age of 18-65 years, physical ability and willingness to participate in the study, a final diagnosis of bronchial asthma by a pulmonologist, and no skin lesions at the massage sites. Exclusion criteria were recently suffering from a disease, severe and continuous progression of the disease, and having acute asthma attack. Written informed consent was obtained from the eligible patients before starting the study and

the researcher emphasized on the confidentiality of the collected information, voluntary participation and free withdrawal at each stage of the study.

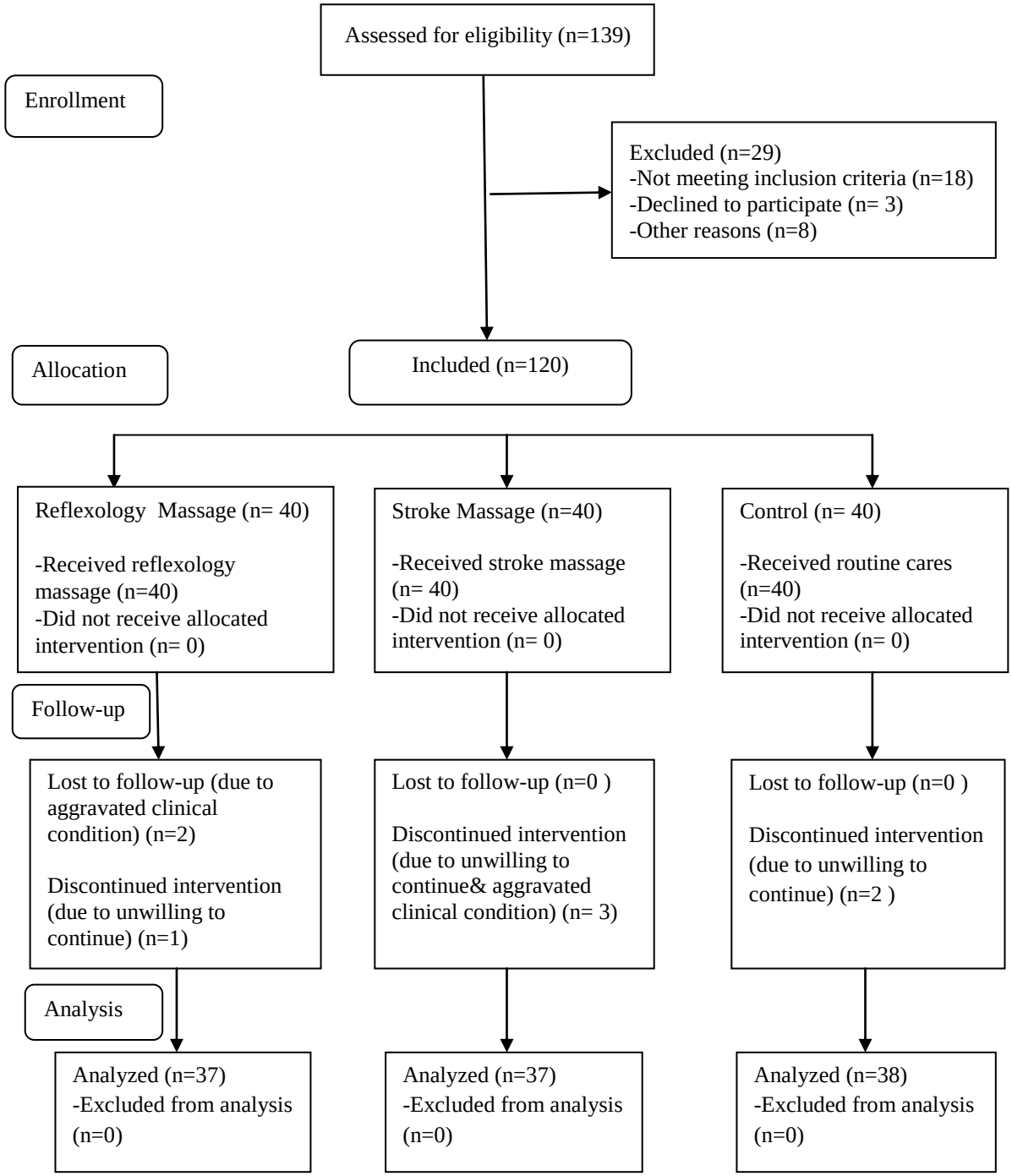

Figure 1. CONSORT flow diagram of the study

In the reflexology group, the patients were asked to take deep breaths before the intervention, bend the toes with the right hand, place the thumb of the left hand under the soft sole of the foot directly below the fourth toe, and use the thumb in a circular motion to gently press the reflex point up to seven times. The patients were also asked to regulate their breathing so that they inhale when the reflex point is pressed and they exhale when the pressure stops. Foot reflexology intervention included preparation (5 minutes), warm-up (10 minutes) and sole reflex techniques (15 minutes). Preparation included warming up the foot with the hand by doing specific movements, holding the front and sole with both hands and bending it back, bending the soles of the feet, turning outwards and

inwards, and movements in the heels. To stimulate the reflex points, the massage was performed using fingers in the form of back and forth movements and applying pressure at about 0.5 cm. In the other intervention group, the stroke massage was done so that the hands are warmed and the person is placed in a sitting position. The masseur was standing behind the patient and placed the palms and fingers of both hands on the patient's occiput, moved one hand towards the lower body parallel to the spine with superficial pressure to reach the sacrum area. Then, the second hand was moved in the same way and the first hand returned to the starting point, and the same process continued during the massage. Four sessions of reflexology and stroke massages were conducted over 4 consequential days per week at morning shift in the mentioned clinic by the first researcher of the study. There was no intervention in the control group and they only received the routine care. Respiratory assessment (subjective and objective data) was conducted using pulse oximetry, stethoscope, observation and respiratory exam. The tools to collect data include; Medisana finger pulse oximetry (made in Germany)to measure oxygen saturation of arterial blood, stethoscope to auscultate respiratory sounds, and the respiratory rate (RR) was manually counted. Accuracy of pulse oximetry measurement was controlled through two devices by the first and third authors as inter-observer for 10 times, then their measures were compared and there was no difference between two persons as well as two devices. The uniformity of the results was measured.

Data were collected as before and after the interventions. The collected data were analyzed using SPSS software (version 19) (IBM SPSS Statistics) and using descriptive statistics including frequency, Chi-square test, and inferential statistics such as One Way Analysis of Variance (ANOVA). The result of parametric tests was reported because the score distributions of continuous variables were normal. Data collector and analyzer were blind to the allocation of the participants to the three groups.

Results

A total of 120 patients with bronchial asthma included in the present study, however, 112 patients (93.33%) completed the study. The mean age of participants was 40.46±12.05 year (18-60 years) and 50.9% (n=57) were female. No significant difference was observed among the three groups in terms of demographic variables (p>0.05) (Table 1).

Table 1. Demographic characteristic of patients in the three groups

Variable	Reflexology Mean±SD N (%)	Stroke Mean±SD N (%)	Control Mean±SD N (%)	*P*-value
Age (yr)	38.56±5.3	37.11±7.87	40.1±16.31	0.178*
Weight (kg)	66.86±8.13	67.46±10.40	66.80±11.61	0.966*
Height (cm)	158.34±7.76	163.11±14.71	158.6±6.96	0.294*
Gender				
Male	19(51.4)	16(43.2)	20(52.6)	0.680**
Female	18(48.6)	21(56.8)	18(47.4)	
Marital status				
Single	9(24.3)	6(16.2)	5(13.2)	0.243**
Married	2(56.8)	29(78.4)	27(71.1)	
Divorced	7(18.9)	2(5.4)	6(15.8)	
Level of Education				
<Diploma	10(27)	16(43.3)	13(34.2)	0.686**
Diploma	14(37.8)	10(27)	12(31.6)	
>Diploma	13(35.2)	11(29.7)	13(34.2)	
Duration of Disease (yr)				
1-3	20(54.1)	20(54.1)	12(31.6)	0.078 **
>3	17(45.9)	17(45.9)	26(68.4)	
Pharmacotherapy				
Bronchodilator	18(48.6)	17(45.9)	17(44.7)	0.430**
Inhaled corticosteroid	16(43.2)	15(40.5)	16(42.1)	
Parenteral corticosteroid	3(8.1)	5(13.5)	5(13.2)	

* One-way ANOVA; ** Chi-Square test

No statistical significant differences were observed among the three groups regarding respiratory

symptoms before the interventions, including daily cough (p=0.498), nocturnal cough (p=0.419), exertional dyspnea (p=0.304), and exertional cough (p=0.149). However, the results of intergroup comparison showed a statistically significant difference among three groups in terms of frequency of respiratory symptoms including daily cough (p=0.012), nocturnal cough (p=0.007), exertional dyspnea (p=0.034), exertional cough (p=0.024) and limited activity (p=0.037) after the interventions (Table 2).

Table 2. Intergroup comparison of respiratory symptoms of the patients in the three groups

Group / Variable/Time			Reflexology N(%)	Stroke N(%)	Control N(%)	Chi-square test *P*-value
Daily Cough	Pre	Yes	20(54.05)	18(48.64)	17(44.73)	0.498
		No	17(45.95)	19(51.36)	21(55.27)	
	Post	Yes	21(56.75)	20(54.05)	26(68.42)	0.012
		No	16(43.25)	17(45.95)	12(31.58)	
Nocturnal Cough	Pre	Yes	26(70.27)	30(81.08)	32(84.21)	0.419
		No	11(29.73)	7(18.92)	6(15.79)	
	Post	Yes	20(54.05)	21(56.75)	30(78.94)	0.007
		No	17(45.95)	16(43.25)	8(21.06)	
Exertional Dyspnea	Pre	Yes	30(81.08)	26(70.27)	24(63.15)	0.304)
		No	7(18.92)	11(29.73)	14(36.85)	
	Post	Yes	20(54.05)	19(51.35)	30(78.94)	0.034
		No	17(45.95)	18(48.65)	8(21.06)	
Limited Activity	Pre	Yes	20(54.05)	18(48.64)	18(47.36)	0.901
		No	17(45.95)	19(51.36)	20(52.64)	
	Post	Yes	16(43.24)	15(40.54)	25(65.78)	0.037
		No	21(56.76)	22(59.46)	13(34.22)	
Exertional Cough	Pre	Yes	32(86.48)	28(75.67)	29(76.31)	0.149
		No	5(13.52)	9(24.33)	9 (23.69)	
	Post	Yes	16(43.24)	12(32.43)	22(57.89)	0.024
		No	21(56.76)	25(67.57)	16(42.11)	

More statistical calculations showed that the observed differences were related to the two interventions groups compared with the control group, however, no significant differences were observed between the two intervention groups. In other word, the interventions had similar effects on the patients' respiratory symptoms. The results of one way ANOVA for intergroup comparison also showed no statistical significant difference among three groups regarding the mean of oxygen saturation of arterial blood and respiratory rate on both pre and post interventions (p=0.526, p=0.520, respectively) (Table 3).

Table 3. Intergroup comparison of the mean scores of oxygen saturation of arterial blood and respiratory rate in the three groups

Group / Variable/Time		Reflexology Mean ± SD	Stroke Mean ± SD	Control Mean ± SD	ANOVA test *P value*
Oxygen saturation of arterial blood	Pre	93.18±1.84	92.74±1.19	92.36±1.14	0.148
	Post	93.28±1.87	93.33±1.15	92.65±1.14	0.165
Respiratory rate	Pre	19.42±1.26	19.75±1	19.48±1.04	0.526
	Post	19.37±0.96	19.05±0.85	19.22±1.01	0.520

SD: Standard Deviation

Discussion

The present study was performed with aim to compare the effect of reflexology and stroke massage on respiratory symptoms of patients with bronchial asthma. Based on the results of this study, the mean score of respiratory symptoms of the two massage therapy groups had statistically significant differences after the intervention compared with the control group. This finding is consistent with the

results of other studies including on the improvement of asthma symptoms caused by reflexology (23), the positive effect of breathing and relaxation techniques on the improvement of symptoms in patients with asthma and chronic obstructive pulmonary disease (COPD) (24), the positive effect of manual massage on the improvement of forced exhalation volume in patients with COPD (25), and the positive effect of Proprioceptive Neuromuscular Facilitation (PNF) on chest expansion and pulmonary function of COPD patients (26). The results of a systematic review by Wu et al. also showed that massage therapy has a significant positive effect on children with asthma and improves their lung function parameters (27). Goli et al. also indicated that combined massage therapy effectively improved the symptoms of children with asthma and maternal anxiety (28). To justify the improvement of respiratory symptoms of the patients in the present study, it can be said that massage facilitates homeostasis and calms the mind, as well as reducing tension and stress (29). Stress is closely related to asthma. Asthma causes stress which makes asthma more difficult to control. Even daily stress can aggravate asthma symptoms. Some studies (30,31) have shown that chronic stress aggravates asthma symptoms, which is probably caused by increased airway inflammation. As mentioned, Xiaojun et al. in their study emphasized the preventive effect of massage on the release of inflammatory mediators. Therefore, controlling the stress reaction is very important to reduce asthma symptoms, and reflexology and stroke massage seem to produce this effect.

According to the results of the present study, the mean of blood oxygen saturation and breathing rate of patients were not significantly different in reflexology, stroke massage and control groups. This finding confirmed the ineffectiveness of reflexology and stroke massage in improving blood oxygen saturation and breathing rate. The results of a study by Fasihi et al. have shown that Hugo point massage reduces the severity of pain, but does not have a significant effect on the respiratory volume of patients (32). Also, another study showed that the systolic and diastolic blood pressure of COPD patients significantly decreased after reflexology compared to the control group, but there was no significant difference in the breathing rate of the patients (33). The results of these studies are consistent with the results of the present study. Meanwhile, Mohamed Abdelfatah Sliman et al. in their research have shown that foot massage is an effective method for stabilizing hemodynamic parameters and reducing patients' dependence on ventilators (34). The results of a study by Baghcheghi et al. also indicated that there is a positive and significant relationship between touch and increased blood oxygen saturation in infants with respiratory distress syndrome (35). Martina et al. showed that back and chest massage by mothers had a significant effect on the breathing rate of infants (36). The results of these studies are not consistent with the results of the present study. Although it was expected that the oxygen saturation of patients would improve due to the effect of massage on stress and epinephrine secretion, our results did not confirm this effect, which may be due to the insufficient number of massage sessions. Also, the difference in the results of the studies may be due to the difference in the technique and method of massage. On the other hand, it is likely that the difference in the nature of the diseases also affects the results.

One of the limitations of the present study is the limited duration of the interventions. Since the long-term effects of massage have not been investigated, it is suggested that future studies be designed to follow up the long-term effects of these massages with more sessions to obtain credible information.

Implications for practice

As evidenced by the results of the present study, both methods of reflexology and stroke massage were effective on the respiratory symptoms of patients with bronchial asthma, and none of the two methods was superior to the other. On the other hand, the easy performance of these massages by the patient and his companions and its low cost can be effective in better controlling the disease and reducing frequent visits to hospitals. These exercises can be done by the patient at home and the patient can benefit from them at any time, so it is suggested that the members of the health team implement these methods in the educational program of patients with bronchial asthma.

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Medical Sciences (ethics code; IR.YUMS.REC.1397.066) and also has been registered on the website of the Iranian Registry Clinical Trials (code: IRCT20180902040924N1).

Conflicts of interest

The authors declared no conflict of interest.

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