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## RESEARCH ARTICLE

### THE EFFECT OF FOOT REFLEXOLOGY ON POSTMENOPAUSAL DEPRESSION: A CONTROLLED RANDOMIZED TRAIL

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#### ABSTRACT

**Background:** Postmenopausal depression, a major public health problem worldwide, is associated with low quality of life, high morbidity and mortality rates with high rate of suicide, and huge socio-economic burden (1). **Purpose:** This study aimed to investigate the effect of foot reflexology on postmenopausal depression. **Participants and methods:** One hundred postmenopausal women with depression, aged 50-65 years, were randomized into two groups equal in number. Group (A) received relaxation exercises in form of diaphragmatic breathing exercises as group (B) in addition to reflexology on pressure points in feet for 1 hour per session, 3 times /week for 6 weeks, while Group (B) received relaxation exercises in form of diaphragmatic breathing exercises, twice per session with rest about 20 second and women was asked to perform breathing exercises at home 3-4 times per day for 6 weeks. Postmenopausal depression was assessed pre-post treatment through Beck Inventory Depression Questionnaire. **Results:** There was highly significant decreases in mean values of (BIDQ) of study group (A) when compared with its corresponding value in control group (B) with  $p = 0.001$ . **Conclusion:** These results suggest that foot reflexology is effective in treating postmenopausal women depression that causes a greater improvement in their quality of life.

#### INTRODUCTION

Depression is a common psychological disease that affects about 350 million worldwide populations. That effect on work performance, interpersonal relationship and financial status. Not only depression affects psychological condition but also affects physical condition by increasing morbidity and mortality rates (1). It has negative effect on Quality of life (QOL) measures, social harmonization, mobility function and health conception (2). It also characterized by decline interpersonal relationships, psycho social and physical health, decreased work outcomes, and increased suicide thoughts (3). The prevalence of depression in postmenopausal women differs widely from each country and each culture. As studies in the Western countries have shown that the prevalence of depression ranges from 1% to 56%, whereas in the Asian studies is between 12.5% and 31%. In Arab postmenopausal women who receiving little support and with a poor body image, had a powerful psychological distress with negative impact on their QOL and can result in 18% increased mortality and higher suicide rates (4).

Reflexology is a holistic healing technique and pressure therapy that works on improving body image, mind and spirit by pressing on specific points on foot that reflex to other body parts, organs and glands(5). Reflexology is non-invasive and safe intervention that decreases pain, anxiety, depression, fatigue, improves sleep quality, immunity functions and has a positive effect on constipation (6). One of the most fifth modality around the world is reflexology due to its safety even on weak patients (7). Most of studies make reflexology session not more than 30 minutes in each area but in these study reflexology session is done one hour in each foot that make postmenopausal women more relaxed more comfortable and more dispense with many antidepressant drugs that causes more side effect than curing in postmenopausal problems from these drugs are adapin, anafranil, aplenzin and so on. The purpose of this study was to investigate the effect of foot reflexology on depression in post-menopausal women.

**Participants and methods Study design:** The study was designed as a randomized controlled trial. Ethical approval was obtained from the Institutional Review Board of the Faculty of Physical Therapy, Cairo University, before starting of the study (no: P.T.REC/012/003145) The study followed the guidelines of Declaration of Helsinki on the conduct of human research.

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**Participant:** One hundred postmenopausal women were selected from outpatient clinic of obstetrics and gynecology in new Cairo hospital in police academy. Their age ranged between 50 – 65 years old; they were divided randomly into two equal number groups. The study was conducted from August 2020 to February 2021. They were selected according to the following inclusion criteria: They were post-menopausal women, Their age ranged between 50-65 years old, They were suffering from depression symptoms (as determined by Beck Inventory Depression Questionnaire (BIDQ)), At least one year after last menstruation. Exclusion criteria of the study were as follows: Postmenopausal woman was excluded from the study if she had: Infection disease or fever, Foot ulcers, Foot infection or undergoing foot surgery, Recent fracture in foot and toes with unhealed wounds, Thrombotic disease of lower extremities, Deep proprioception loss, Peripheral neuropathy, Gout or advanced arthritis affecting the foot and toes, Impaired skin integrity, Diagnosis of diabetes, Cigarette and alcohol consumption, Using other complementary therapies, Lower limb sprain. All participants were subjected to full history taking, clinical examination, and investigation to confirm inclusion criteria and distract excluded cases.

## METHODS

The subjects were randomly distributed into two equal groups: *Foot reflexology applied to group (A) in addition to breathing exercises* They were received foot reflexology on pressure points in feet for 1 hour per session, 3 times /week for 6 weeks.

On each session before starting reflexology work, the skin of the feet was inspected for any cuts or broken. Patient in the study group instructed to come one hour after any meals then lay in comfortable position as supine on clean plinth in warm and quite with dim lighting and peaceful music (8). With pillow under head for relaxation and under knees to prevent muscle strains and fatigue, the feet should be close to each other during foot reflexology (8). Each area washed before foot reflexology session by cotton filled by alcohol (8). No cream or lotion was used on the patient's skin to prevent slipping of therapist hand during applying pressure on the certain points and patient was asked to make foot hygiene (washing foot by water and soap with cutting nails (8). Begin with right foot in all sessions and make whole foot then start the left one (8). Massage with the foot rotation, Achilles stretching and foot stretching, performed for a minute on each foot (8). Massage the foot all over slowly but firmly to loosen it up, beginning at the toes moving down towards the heel, for about thirty seconds, using both hands, hold on to the spine area with the palm of the hands- fingers on top of the foot and thumbs on bottom of the foot then slowly and gently twist/wring the hands away from each other in order to gently twist the spine area on the foot. This is a relaxation exercise (9). In the right foot, the bottom of the heel was kept with the left hand, and the metatarsal arch of the same foot was held with the other hand. Then, the foot was rotated clockwise and counter clockwise three times each direction. The same technique was performed on the left foot (10) in addition to relaxation exercise in form of diaphragmatic breathing exercise twice per session with rest about 20 second and women asked to perform breathing exercises at home 3-4 times per day for 6 weeks.

Each time was 5 breaths to avoid dizziness and hyperventilation. Breathing exercises was applied in a relaxed place with dimmer light and music played where patient is

relaxed. Each woman was placed in a comfortable relaxed position and asked to loosen restrictive clothes. Then, put hand one ribcage and other hand on abdomen where thumb directed up then instructed to take a slow and deep breath from her nose with keeping her shoulders relaxed and upper chest quite and fill her abdomen with air and then expire the air from mouth with a sigh, like deflating a balloon. Expiration was relaxed and passive.

**Breathing exercises applied to group (B):** They were received relaxation exercise in form of diaphragmatic breathing exercises twice per session with rest about 20 second and women asked to perform breathing exercises at home 3-4 times per day for 6 weeks. Each time was 5 breaths to avoid dizziness and hyperventilation. Breathing exercises was applied in a relaxed place with dimmer light and music played where patient is relaxed. Each woman was placed in a comfortable relaxed position and asked to loosen restrictive clothes. Then, put hand one ribcage and other hand on abdomen where thumb directed up then instructed to take a slow and deep breath from her nose with keeping her shoulders relaxed and upper chest quite and fill her abdomen with air and then expire the air from mouth with a sigh, like deflating a balloon. Expiration was relaxed and passive.

**Outcome measures:** The assessment of the participants in the two groups (A and B) was carried out before, after 6 weeks through beck inventory depression questionnaire. Beck inventory depression questionnaire is valid, simple, easy to use and self-reported questionnaire which designed as interview with questions that show the patient's attitudes at the time of the interview, It was used for measuring intensity of depression on a Likert scale contain 21 items self-report questionnaire ranging from 0 to 3 with anchors to each scale value. Item 1 is (0 = not feel sad, 1 = feel sad, 2 = sad all the time and can't get out, 3=so sad and unhappy that can't stand), Item 2: 0= not discouraged, 1 = discouraged, 2 = nothing to look forward, 3 = hopeless and cannot improve). The sum of the BDI scores identifies the level of depression which from 0 to 63 : scores 0 through 9 indicates no or minimal depression, 10 through 18 indicates mild to moderates depression, 19 through 29 indicates moderate to severe depression, 30 through 63 indicates severe depression(11)

**Determination:** Sample size calculation was performed using G\*POWER statistical software (version 3.1.9.2; Franz Faul, Universitat Kiel, Germany) based on data from pilot study and revealed that the required sample size for this study was 50 subjects per group. Calculations were made using  $\alpha=0.05$ ,  $\beta=0.2$  and effect size = 0.57 and allocation ratio  $N2/N1 = 1$ .

**Statistical analysis:** Descriptive statistics and unpaired t-test were conducted for comparison of subject characteristics between both groups. Normal distribution of data was checked using the Shapiro-Wilk test.

Levene's test for homogeneity of variances was conducted to ensure the homogeneity between groups. Unpaired t-test was conducted to compare the mean values of BIDQ between the study and control groups. Paired t-test was conducted for comparison between pre and post treatment in each group. The level of significance for all statistical tests was set at  $p < 0.05$ . All statistical analysis was conducted through the statistical package for social studies (SPSS) version 25 for windows (IBM SPSS, Chicago, IL, USA).

## RESULTS

**Subject characteristics:** Table 1 showed the subjects' characteristics of the study and control groups. There was no significant difference between groups in the mean age, weight, height and BMI ( $p > 0.05$ ).

depression among old age people. Foot reflexology was given to selected old age people who had mild and severe depression. The intervention was given for the duration of 20 minutes once in every three days for 10 sessions. The calculated (t) value was greater than the table value so there was significant difference between pre-test and post-test score.

**Table 1. Basic characteristics of participants**

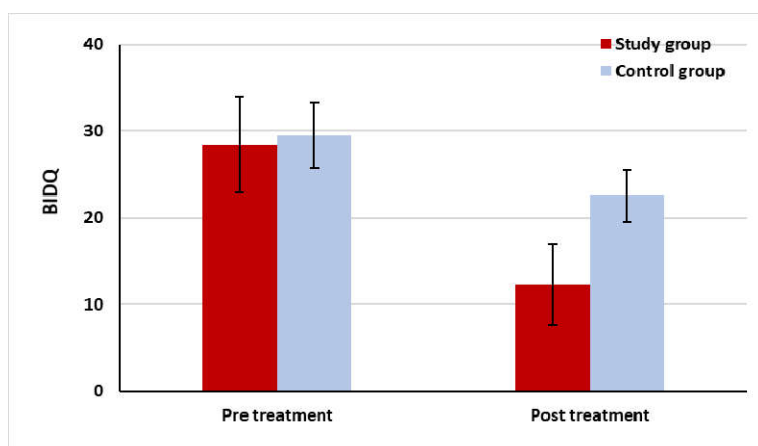
	Study group	Control group	MD	t- value	p-value
	$\bar{x} \pm SD$	$\bar{x} \pm SD$			
Age (years)	57.16 ± 4.73	56.56 ± 3.01	0.6	0.75	0.45
Weight (kg)	81.38 ± 7.03	82.52 ± 9.86	-1.14	-0.66	0.5
Height (cm)	163.26 ± 5.72	164.68 ± 6.5	-1.42	-1.15	0.24
BMI (kg/m <sup>2</sup> )	30.59 ± 2.9	30.42 ± 3.05	0.17	0.29	0.77

$\bar{x}$ , Mean; SD, Standard deviation; MD, Mean difference; p value, Probability value

**Table 2. Mean BIDQ pre and post treatment of the study and control groups:**

BIDQ	Study group	Control group	MD	t- value	p value
	$\bar{x} \pm SD$	$\bar{x} \pm SD$			
Pre treatment	28.4 ± 5.51	29.46 ± 4.66	-1.06	-1.03	0.3
Post treatment	12.28 ± 3.79	22.52 ± 3.01	-10.24	-14.93	0.001
MD	16.12	6.94			
Percentage of change	56.76%	23.56%			
t- value	23.68	13.4			
	$p = 0.001$	$p = 0.001$			

$\bar{x}$ , Mean; SD, Standard deviation; p value, Probability value



**Figure 1. Mean BIDQ pre and post treatment of the study and control groups**

## DISCUSSION

The results of this study confirmed that there was a highly statistically significant decrease in depression in the study group (A) who treated with foot reflexology and diaphragmatic breathing compared with the degree of depression in control group (B) who received diaphragmatic breathing only with p-value  $P = 0.001$ . The results of this study agreed with those of Wang *et al.*, 2020 (12) who investigate that the impact of foot reflexology on depression, anxiety and sleep quality. Meta-analysis for improvement of psychological symptoms indicated that the foot reflexology could effectively relieve depression, anxiety and sleep quality. The results of this study are supported by Moddares *et al.*, 2020 (8) who provided that massage intervention was not as effective as a non-invasive, low-cost method foot reflexology to improve the postpartum energy level in the study participants. The results of this study came in the line with Daphine *et al.*, 2020 (13) who concluded that providing foot reflexology was effective in reduce

depression among old age people. As showed by Valenza *et al.*, 2014(9) that there is significant improvement in depression and anxiety of chronic obstructive pulmonary disease (COPD) patient due to hospitalization inactivity effect. Breathing exercises rehabilitation programs can reduce anxiety and depression in COPD patients.

Where exercise training program combined with education that included stress management techniques significantly reduced anxiety and depression. On contrast to the study, Razmjoo *et al.*, 2012 (14) found that reflexology did not cause anxiety decrease of women after elective caesarean which is not in consistent with our study. One of the reasons of this inconsistency can be different statistical population, also measuring anxiety and pain simultaneously with one scale (100-mm visual scale) and after caesarean section which can make problem for the patient in their segregation can be another reason.

## Conclusion

Based on the scope and findings of this study, the following conclusion appeared to be warranted: Foot reflexology is safe, non-invasive and simple method that produces a greater improvement in treatment of depression and significance improves the quality of life in women with postmenopausal depression. Foot reflexology is effective on postmenopausal women suffering from depression.

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