Effect of the Reflexology versus Aerobic Training on Quality of Life in Hypertensive Patients

Maha M Mohammed [1], Zahra M Hassan [1], Samia Ali Abdulla [2], Asmaa M Mohamed [1].

[1] Department of Physical Therapy for Cardiovascular/Respiratory disorders and geriatrics / Faculty of Physical Therapy / Cairo University.

[2] Department of Cardiovascular Diseases / National Cardiac Institute / Cairo University.

ABSTRACT

Background: In Egypt, there is a dearth of understanding of the benefits of reflexology and aerobic exercise on hypertension patients' quality of life. The study's goal is to examine the impact of reflexology and aerobic exercise on hypertension patients' quality of life. **Subjects and Methods:** Forty hypertensive female patients between 35 and 45 were assigned two equal groups equal in number (A and B). Twenty female patients in group (A) got medications and aerobic training, while twenty female patients in group (B) had the exact treatment as group (A) as well as foot reflexology. A short form 36 quality of life questionnaire was used to assess the patients who took part in the study (SF-36). They were assessed before and after the eight-week treatment program, which consisted of three sessions each week; following four weeks of treatment (post-1) and additional four weeks of treatment (post-2). **Results:** The results demonstrated substantial variations in the measured variable between the two groups before and after treatment (post-1) and (post-2). When the measured variable's post-treatment values (post-1) and (post-2) were compared between the two foot reflexology and aerobic training can be added to the physical therapy program.

Keywords: Foot reflexology; Aerobic training; Quality of life; Hypertensive patients

INTRODUCTION

When people are on current antihypertensive medication, they are said to have hypertension and/or a systolic blood pressure of greater than or equal to 140 mmHg and/or a diastolic blood pressure of greater than or equal to 90 mmHg are said to be on current antihypertensive medication. If not identified and managed effectively, hypertension is the most common illness seen in primary care, and it can lead to myocardial infarction, stroke, renal failure, and death **[1].** Hypertension leads to stroke, myocardial infarction (heart attacks), heart failure, aortic aneurysms, peripheral arterial disease, and chronic renal disease **[2].**

Hypertension is a sign of a cardiovascular degenerative illness that primarily affects the elderly, with no clear aetiology. The most common cause of death from cardiovascular disease is hypertension. Lowering blood pressure with pharmaceuticals as well as non-drug and non-pharmaceutical approaches, on the other hand, reduces damage to target organs and helps to prevent cardiovascular disease **[3].**

Walking and swimming are examples of aerobic exercises that generate faster breathing and heart pumping than at rest. Aerobic exercise has numerous advantages, including strengthening the heart and boosting circulation, decreasing blood pressure, and aiding in blood sugar and weight management **[4].**

Running, cycling, or swimming at a moderate intensity for 30–45 minutes is commonly used as an aerobic exercise **[5].** Massage is applied to reflex zones in the feet and hands in reflexology, a type of complementary medicine **[6].**

Reflexology raise the flow of blood during nerves activation in body. Reflex zone therapy is a word that is used in reflexology. The body consists of ten zones begin with the head and ends with the toe while doing a therapy of reflex zone **[7].**

SUBJECTS AND METHODS

Study design:

The participated patients were enrolled based on the following inclusion and exclusion criteria: In this study, forty hypertensive female patients between the ages of 35 and 45 were recruited from the Misr Petrolium Company's out-patient clinic in Cairo, Egypt. The study was a comparison study, and it lasted from January to May of 2022, with ethical approval from the faculty ethics committee (P.T.REC/012/003585). The participants in this study were assessed using the (SF-36), which was administered three times per week for eight weeks before and after the treatment programme; the post assessment was administered after four weeks of treatment (post-1) and another four weeks of treatment (post-2).

The people that took part in the study were chosen based on the following inclusion and exclusion criteria:

(A) Inclusion criteria:

Forty hypertensive female patients aged 35 to 45 years, clinical and medically, all of the participants were in good health and the BMI ranged from 30 to 34.9 kg/m^2 for all participants.

(B) Exclusion criteria:

Close myocardial infarcts, heart block or complex ventricular arrhythmia, cerebrovascular disease is a condition in which the blood vessels in the brain

become inflamed, defects in vision or hearing, significant tightness in the lower limbs and/or a fixed deformity of lower limbs, balance or mentality-related neurological diseases (e.g. epilepsy) and abnormalities of lower limb that may be congenital or acquired.

- **Methods:**

A) Evaluation:

The SF-36 is a 36-question questionnaire that is used to assess health-related quality of life **[9].**

B) Treatment:

Forty hypertensive female patients were randomly assigned to one of two groups (A or B) based on the following criteria:

Group (A):

It consists of twenty patients suffering from hypertension who underwent medical treatment as well as peddler training three times every week for a period of eight weeks **[10].** After four weeks of treatment (post-1) and another four weeks of treatment, the post evaluation was used (post-2).

Each patient in this study did 20 minutes of peddler aerobic training, with the first 5 minutes serving as a warm-up with intensity set at 60 – 65 percent of maximal heart rate, followed by another 10 minutes of peddler training with intensity gradually increased up to 70 – 75 percent, and the last 5 minutes serving as a cooling down with intensity set at 60 – 65 percent of maximal heart rate. After the warm-up and at the end of each training phase, the participants' heart rates were monitored. Finally, patients was informed about symptoms limiting exercises where the training sessions promptly terminated as: pain, fainting, or shortness of breath, the training was promptly terminated **[10].**

Group (B):

This group consisted of twenty patients had hypertension who received the same drugs as group (A) as well as foot reflexology three times each week for eight weeks **[11].**

Following four weeks of treatment (post-1) and additional four weeks of treatment (post-2) the post evaluation was used (post-2). Before and after the foot reflexology, blood pressure was checked twice. Around 20 minutes is spent on foot reflexology which applied a gentle firm pressure on the distal part of the first metatarsal bone **[11].** Blood pressure, pulse rate, and insomnia would all be treated with reflexology points

Statistical analysis:

The following two types of statistics were used to collect and evaluate the data using SPSS version 17:

-Descriptive Statistics:

For each parameter, the mean and standard deviation of each group were computed.

•The mean (X) is equal to the total of x divided by the number of x.

•The root square of variance is equal to the standard deviation (SD).

- Inferential Statistics:

A paired t-test was used to compare mean values between pre and post for each parameter within each group.

-• The MANOVA test was used to compare mean values between the two groups of pre, post-1, and post-2 for each parameter.

-• An unpaired t-test was used to compare mean values of each parameter between

the two groups before and after three months of treatment.

- In this investigation, the probability was greater than 0.05 percent.

RESULTS

A) Demographic data of the subjects in groups (A and B):

The hypertensive female patients who took part in this study were divided into two groups, each with an equal number of participants.

Group (A): consists of 20 women with a standard deviation of 39.8 ± 3.84, a standard deviation of 1.62 ± 0.02, a standard deviation of weight of 83.3 ± 3.53, and a standard deviation of BMI of 31.84 ± 1.21 (table 1).

Group (B): consists of 20 women with a standard deviation of 40.15 ± 2.6, a standard deviation of 1.63 ± 0.03, a standard deviation of weight of84.6 ± 4.2, and a standard deviation of BMI of 34.2 ± 11 (table 1).

Table (1): Mean values of age, height, weight and BMI of groups (A and B).

Variable	Groups	$\overline{X}$ ± SD	t-value	p-value
Age (years)	**Group (A)**	39.8 ± 3.84	0.41	0.687
	Group (B)	40.15 ± 2.6		NS
Height (m)	**Group (A)**	1.62 ± 0.02	1.77	0.086
	Group (B)	1.63 ± 0.03		NS
Weight (km)	**Group (A)**	83.3 ± 3.53	1.06	0.296
	Group (B)	84.6 ± 4.2		NS
BMI (kg/m^2)	**Group (A)**	31.84 ± 1.21	0.91	0.376
	Group (B)	34.2 ± 11.7		NS

$\overline{X}$: Mean. SD: Standard Deviation. t-value: Paired and Un-paired t- test value.

p-value: Probability value. S: Significant.

B) Measured variables included:

Short form 36 quality of life questionnaire (SF-36)

(a) Comparison between pre, post-1 and post-2 treatment mean values of short form 36 quality of life questionnaire (SF-36) of the groups (A and B):

When comparing between pre, post-1 and post-2 treatment mean values of the group (A), the $\overline{X}$ ± SD values were 40.92 ± 4.23, 46.6 ± 4.32 and 52.57 ± 4.14 respectively which indicated significant difference (p= 0.0001) (table 2) and (figure 1), while comparing between pre, post-1 and

post-2 treatment mean values of the group (B), the $\overline{X}$ ± SD values were 41.7 ± 4.09, 52.31 ± 4.17 and 58.76 ± 3.9 respectively which indicated significant difference (p= 0.0001) (table 2) and (figure 2).

Table (2): Comparison between pre, post-1 and post- treatment mean values of short form 36 quality of life questionnaire (SF-36) of the groups (A and B).

Items	Short form 36 quality of life questionnaire (SF-36)					
	Group (A)			Group (B)		
	Pre-treatment	Post-1 treatment	Post-2 treatment	Pre-treatment	Post-1 treatment	Post-2 treatment
$\overline{X}$ ± SD	40.92 ± 4.23	46.6 ± 4.32	52.57 ± 4.14	41.7 ± 4.09	52.31 ± 4.17	58.76 ± 3.9
f-value	37.91			90.2		
p-value	0.0001			0.0001		
Level of Significant	S			S		

$\overline{X}$: Mean.Pre: Before treatment. Post-1: After four weeks of treatment.

Post-2: After another four weeks of treatment. MD: Mean of difference.

SD: Standard Deviation.f-value: MANOVA test value.

p-value: Probability value.S: Significant.

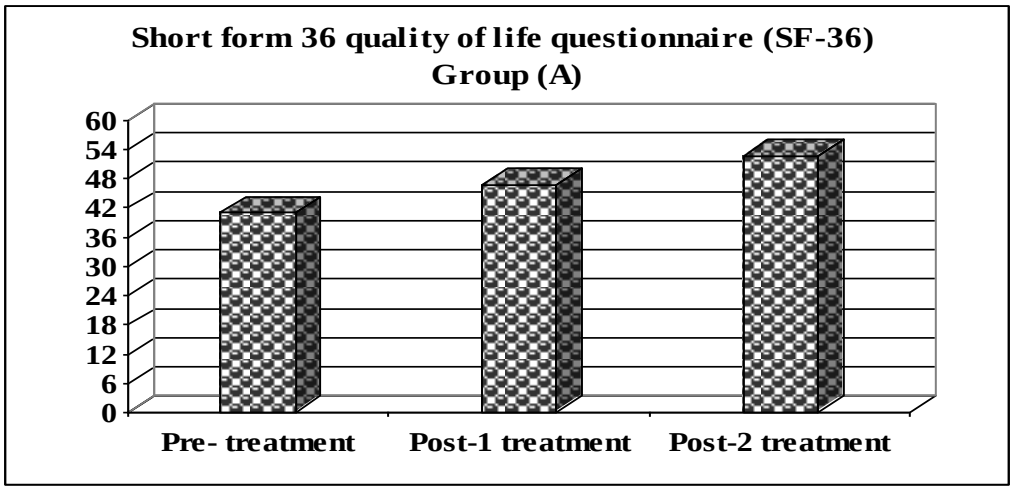

Figure (1): Comparison between pre, post-1 and post- treatment mean values of Short form 36 quality of life questionnaire (SF-36) of group (A).

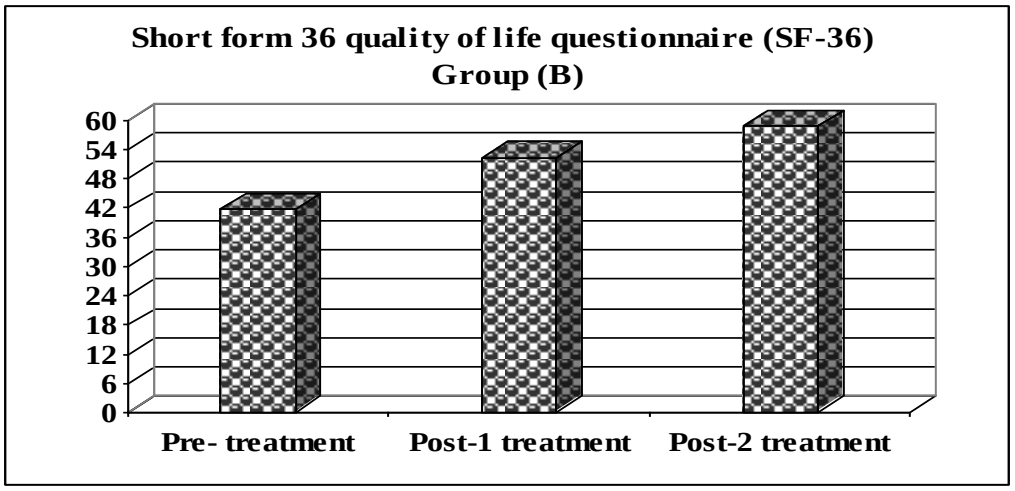

Figure (2): Comparison between pre, post-1 and post- treatment mean values of short form 36 quality of life questionnaire (SF-36) of group (B).

(b) Comparison between (pre and post-1), (pre and post-2) and (post-1 and post-2) treatment mean values of short form 36 quality of life questionnaire (SF-36)of the group (A):

When comparing between pre and post-1 treatment mean values of the group (A), the $\overline{X}$ ± SD values were 40.92 ± 4.23 and 46.6 ± 4.32 respectively which indicated significant difference (p= 0.0001) and % of change= 12.88 %, comparing between pre and post-2 treatment mean values, the $\overline{X}$ ± SD values were 40.92 ± 4.23 and 52.57 ± 4.14 respectively which indicated significant difference (p= 0.0001) and % of change= 28.87 % while comparing between post-1 and post-2 treatment mean values, the $\overline{X}$ ± SD values were 46.6 ± 4.32 and 52.57 ± 4.14 respectively which indicated significant difference (p= 0.0001) and % of change= 12.81 % (table 3) and (figure 3).

Table (3): Comparison between (pre and post-1), (pre and post-2) and (post-1 and post-2) treatment mean values of short form 36 quality of life questionnaire (SF-36) of the group (A).

Items	Short form 36 quality of life questionnaire (SF-36) Group (A)					
	Pre-treatment	Post-1 treatment	Pre-Treatment	Post-2 Treatment	Post-1 treatment	Post-2 treatment
$\overline{X}$ ± SD	40.92 ± 4.23	46.6 ± 4.32	40.92 ± 4.23	52.57 ± 4.14	46.6 ± 4.32	52.57 ± 4.14
MD	5.68		11.65		5.97	
% of change	13.88 %		28.47 %		12.81 %	
t-value	31.06		38.29		22.5	
p-value	0.0001		0.0001		0.0001	
Level of Significant	S		S		S	

$\overline{X}$: Mean. Pre: Before treatment. Post-1: After four weeks of treatment.

Post-2: After another four weeks of treatment. SD: Standard Deviation.

MD: Mean of difference. t-value: Paired and unpaired t-test value.

p-value: Probability value. S: Significant.

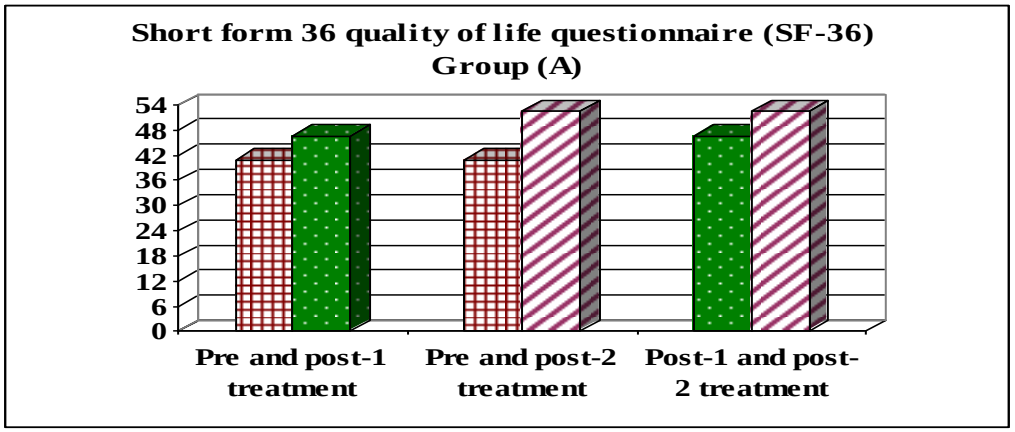

Figure (3): Comparison between (pre and post-1), (pre and post-2) and (post-1 and post-2) treatment mean values of short form 36 quality

of life questionnaire (SF-36) of the group (A).

(c) Comparison between (pre and post-1), (pre and post-2) and (post-1 and post-2) treatment mean values of short form 36 quality of life questionnaire (SF-36) of the group (B):

When comparing between pre and post-1 treatment mean values of the group (A), the $\overline{X}$ ± SD values were 41.7 ± 4.09 and 52.31 ± 4.17 respectively which indicated significant difference (p= 0.0001) and % of change= 25.44 %, comparing between pre and post-2 treatment mean values, the $\overline{X}$ ± SD values were 41.7 ± 4.09 and 58.76 ± 3.9 respectively which indicated significant difference (p= 0.0001) and % of change= 40.91 % while comparing between post-1 and post-2 treatment mean values, the $\overline{X}$ ± SD values were 52.31 ± 4.17 and 58.76 ± 3.9 respectively which indicated significant difference (p= 0.0001) and % of change= 12.33 % (table 4) and (figure 4).

Table (4): Comparison between (pre and post-1), (pre and post-2) and (post-1 and post-2) treatment mean values of short form 36 quality of life questionnaire (SF-36) of the group (B).

Items	Short form 36 quality of life questionnaire (SF-36) Group (B)					
	Pre-treatment	Post-1 treatment	Pre-Treatment	Post-2 Treatment	Post-1 treatment	Post-2 treatment
$\overline{X}$ ± SD	41.7 ± 4.09	52.31 ± 4.17	41.7 ± 4.09	58.76 ± 3.9	52.31 ± 4.17	58.76 ± 3.9
MD	10.61		17.06		6.45	
% of change	25.44 %		40.91 %		12.33 %	
t-value	21.27		31.61		22.1	
p-value	0.0001		0.0001		0.0001	
Level of Significant	S		S		S	

$\overline{X}$: Mean. Pre: Before treatment. Post-1: After four weeks of treatment.

Post-2: After another four weeks of treatment. SD: Standard Deviation.

MD: Mean of difference. t-value: Paired and unpaired t-test value.

p-value: Probability value. S: Significant.

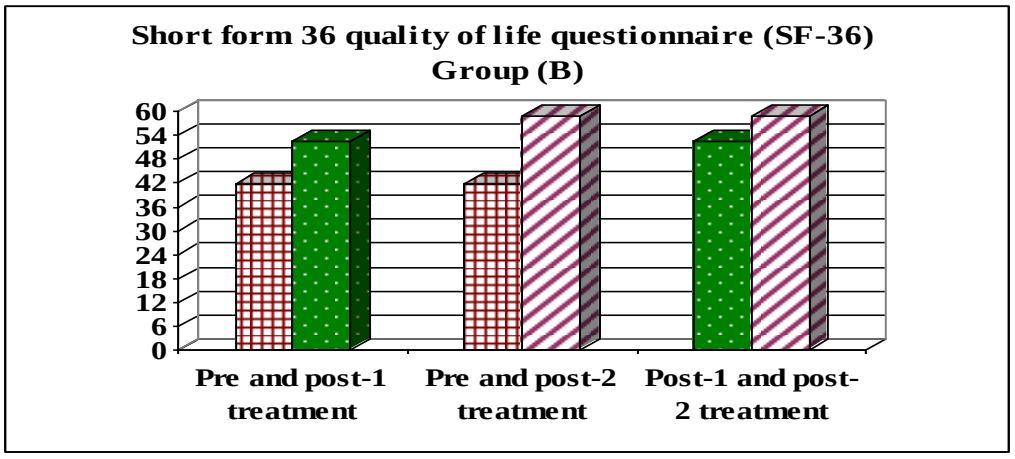

Figure (4): Comparison between (pre and post-1), (pre and post-2) and (post-1 and post-2) treatment mean values of short form 36 quality of life questionnaire (SF-36) of the group (B).

(d) Comparison between pre, post-1 and post-2 treatment mean values of short form 36 quality of life questionnaire (SF-36) between the groups (A and B):

When comparing between pre - treatment mean values of the groups (A and B), the $\overline{X} \pm$ SD values were 40.92 ± 4.23 and 41.7 ± 4.09 respectively which indicated no significant difference (p= 0.556), comparing between post-1 treatment mean values, the $\overline{X} \pm$ SD values were 46.6 ± 4.32 and 52.31 ± 4.17 respectively which indicated significant difference in favor of group (B) (p= 0.0001) and % of change= 12.25 % while comparing between post-2 treatment mean values, the $\overline{X} \pm$ SD values were 52.57 ± 4.14 and 58.76 ± 3.9 respectively which indicated significant difference in favor of group (B) (p= 0.0001)and % of change= 11.77 %**(table 5) and (figure 5).**

Table (5): Comparison between pre, post-1 and post-2 treatment mean values of short form 36 quality of life questionnaire (SF-36) between the groups (A and B).

Items	Short form 36 quality of life questionnaire (SF-36)					
	Pre- treatment		Post-1 treatment		Post-2 treatment	
	Group (A)	Group (B)	Group (A)	Group (B)	Group (A)	Group (B)
$\overline{X} \pm$ SD	40.92 ± 4.23	41.7 ± 4.09	46.6 ± 4.32	52.31 ± 4.17	52.57 ± 4.14	58.76 ± 3.9
MD	0.78		5.71		6.19	
% of change	-		12.25 %		11.77 %	
t-value	0.59		4.25		4.87	
p-value	0.556		0.0001		0.0001	
Level of Significant	NS		S		S	

$\overline{X}$: Mean. Pre: Before treatment. Post-1: After four weeks of treatment.

Post-2: After another four weeks of treatment. SD: Standard Deviation.

MD: Mean of difference. t-value: Paired and unpaired t-test value.

p-value: Probability value. S: Significant. NS: Non Significant.

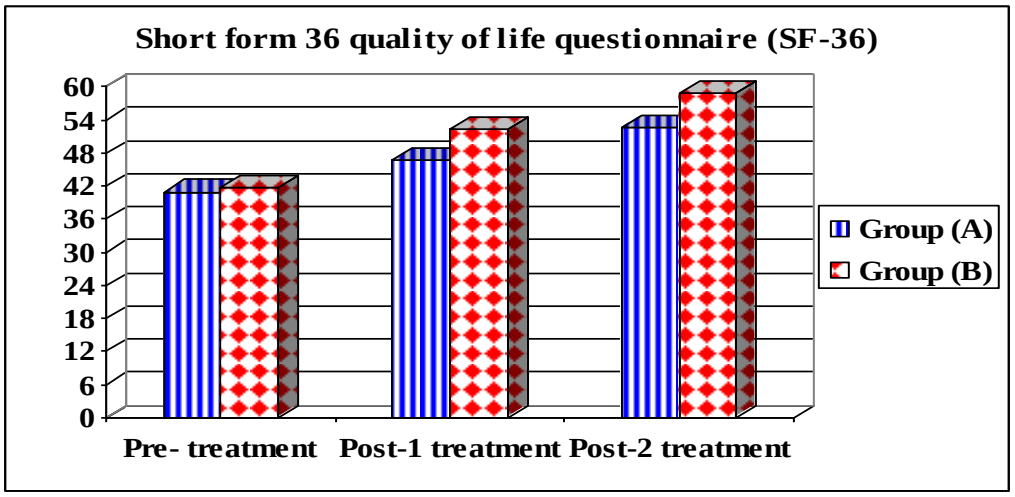

Figure (5): Comparison between pre, post-1 and post-2 treatment mean values of short form 36 quality of life questionnaire (SF-36) between the groups (A and B

).

ISCUSSION

The current study looked at the impact of reflexology and aerobic exercise on hypertension patients' quality of life. Forty hypertensive female patients, between 35 and 45 years old were assigned to two equal groups (A and B). Twenty hypertension female patients in group (A) received drugs and aerobic training in the form of peddling training, while 20 hypertensive female patients in group (B) received the same medications as group (A) plus reflexology. SF-36 was used to test those who shared in the search. They were assessed before and after the eight-week treatment program, which consisted of three sessions each week; Following four weeks of treatment (post-1) and additional four weeks of treatment (post-2).

The technique of blood pressure reducing following both dynamic also aerobic exercise was studied clearly [12]. Reduced total peripheral resistance appears to be the primary mechanism by which resting blood pressure is reduced after exercise training, according to these research. Alterations in activity of sympathetic nerve made a change in the vascular response, and changes in vascular anatomy all have a role in decreasing the resistance of vascularity which followed the training **[13, 14].**

Aerobic activity causes a rise in systolic blood pressure, a decrease in vascular resistance due to vasodilation in the exercising muscles, and no change in diastolic blood pressure or even a small decrease in diastolic blood pressure **[15].** Swimming appeared to lower systolic and diastolic blood pressure in hypertensive rats in the majority, if not all, of the experimental trials. Increased muscle insulin sensitivity, sympathetic system inhibition, and a reduction in vasoconstrictor prostaglandins are only a few of the hypothesised routes **[10].**

When the pre- and post-treatment findings of group (A) were compared, there was a significant increase, which agrees with **Neto et al., [16],** who observed that systolic and diastolic blood pressure increased immediately after the three exercise protocols and decreased after 30 minutes of recovery (compared to immediately after exercise). We discovered that after 30 minutes of recovery, systolic and diastolic blood pressure were lower than at rest, indicating post-effort hypotension. Many additional research have looked at various exercise regimes and found the same hypotension-related to exercise.

The results of this study on group (A) are consistent with those of **Bouzid et al., [17],** who conducted a study using acute aerobic exercise without blood flow restriction. The researchers fundraise in the activity of the enzyme in volunteers after intense exercise

and recovery. Given that the hypertensive population needs to exercise, and that low-intensity exercise may not provide significant advantages when compared to moderate/intensity exercise [**18],**

The findings of this study were also supported by those of **Figueroa et al., [19],** who found that moderate-intensity aerobic exercise combined with circuit resistance training and endurance exercise training had beneficial effects on blood pressure, arterial stiffness, blood pressure, heart rate, and muscle power in hypertensive women. Hormonal and structural changes are to blame. These changes include a reduction in sympathetic nerve activity due to lower norepinephrine levels, a reduction in peripheral vasoconstriction, and an increase in hypertensive patients [**20].**

Collier et al., [21], who studied the potential sex differences of employing aerobic exercise training against resistance exercise training in 40 hypertension patients, found that our findings were similar. The study's findings revealed that moderate-intensity aerobic exercise is a conservative and safe therapy option for high blood pressure, as it lowers both systolic and diastolic blood pressure.

When the was a comparison between the results of group (B) pre and post treatment, there was a significant difference, which is the same with **Hyeon-Soon and Dong-[22]** Oak's study on the benefits of foot reflexology on blood pressure in old critical patients with hypertension. 71 senior patients with essential hypertension took part in the study, which lasted six weeks and involved foot reflexology. Foot reflexology was found to have a positive effect on blood pressure reduction.

Pour et al. [23] conducted a study to assess the effects of non-pharmacological foot reflexology on systolic and diastolic blood pressures in stroke patients. After receiving foot reflexology, the experimental group's blood pressure was significantly lowered ($P<0.05$). After 10 and 30 minutes of massage, the experiment group's mean systolic blood pressure was considerably lower, as was the diastolic blood pressure ($P<0.05$).

The findings of this study are consistent with those of **Elmahy et al., [24]**, who investigated the effect of laser on acupuncture points on hypertension in obese patients. Laser was found to have a highly substantial effect in lowering blood pressure. These findings matched those of **Zhang et al., [25],** who conducted a research on 55 volunteers who were treated with laser acupuncture. After 12 weeks of treatment, there were significant changes in blood pressure.

Foot reflexology was found to be an effective strategy for lowering systolic pressure and triglycerides in the current investigation. Foot reflexology has a significant impact on cardiovascular parameters, and it is especially advantageous to persons with foot problems, especially those with type 2 diabetes **[26].**

Aerobic exercise as well as foot reflexology can be added to a physical therapy program, and reflexology was found to be more beneficial in improving quality of life in hypertension patients.

REFERENCES

1. Nawara EN, El-Nahas N, Hassan Z, Kamel M. Effect of Aerobic Training on Blood Viscosity in Hypertensive Women. Med. J. Cairo Univ. 2019; 87 (8): 5005 – 5008.

2. Abd El-hady AA, El-sayed SH, Shokka WA, Fahmy LM. Interval Aerobic Exercise versus Cupping Therapy on Essential Hypertension in Women. Med. J. Cairo Univ. 2018; 86 (4): 1939 – 1946.

3. Gudsoorkar PP,Tobe SW. Changing concepts in hypertension management. J. Hum. Hypertens. 2017; 31 (12): 763 – 767.

4. Bidonde J, Busch AJ, Schachter C, Overend TJ, Kim SY, Goes SM, Boden C, Foulds HJ. Aerobic exercise training for adults with fibromyalgia. Cochrane Database Syst. Rev. 2017; 6 (6): CD012700.

5. Boutcher YN, Boutcher SH. Exercise intensity and hypertension: what's new?. J. Hum. Hypertens. 2017; 31 (3): 157 – 164.

6. Lu WA, Chen GY, Kuo CD. Foot Reflexology Can Increase Vagal Modulation, Decrease Sympathetic Modulation, and Lower Blood Pressure in Healthy Subjects and Patients With Coronary Artery Disease. Altern Ther Health Med. 2021; 17 (4): 8 – 14.

7. Chandrasekar S, Abisha S, El-Anchezhiyan M, Jeysankar M. Design an electronic enabled organic cotton house slipper for foot reflexology treatment. Asian J. Converg. Technol. 2018; 5 (1): 1 – 3.

8. Wang WL, Hung HY, Chen YR, Chen KH, Yang SN, Chu CM, Chan YY. Effect of Foot Reflexology Intervention on Depression, Anxiety, and Sleep Quality in Adults: A Meta-Analysis and Metaregression of Randomized Controlled Trials. Evidence-Based Complement. Alternat. Med.2020; 1 – 21.

9. Ware J. SF-36 Health Survey Update. Spine 2010; 25 (24): 3130 – 3139.

10. Farahani AV, Mansournia MA, Asheri H, Fotouhi A, Yunesian M, Jamali M, Ziaee V. The Effects of a 10-Week Water Aerobic Exercise on the Resting Blood Pressure in Patients with Essential Hypertension. Asian J.Sports Medicine 2020; 1 (3): 159 – 167.

11. Mohamed S, Serry Z, Elnahas N, Sally Hakim S. Laser Versus Reflexology on Kidney Functions in Patients with Hypertension Enrolled under Dash Diet. Int. J. Pharm. Tech. Res. 2016; 9 (4): 102 – 107.

12. Brett SE, Ritter JM, Chowienczyk PJ. Diastolic blood pressure changes during exercise positively correlate with serum cholesterol and insulin resistance". Circulation. 2020; 101 (6): 611 – 615.

13. Pescatello LS, Franklin BA, Fagard R, Farquhar WB, Kelley GA, Ray CA. American College of Sports Medicine position stand. Exercise and hypertension. Med. Sci. Sports Exerc. 2014; 36 (3): 533 – 553.

14. Hamer M. The anti-hypertensive effects of exercise: integrating acute and chronic mechanisms. Sports Med. 2016; 36 (2): 109 – 116.

15. Amery A, Julius S, Whitlock LS, Conway J. Influence of hypertension on the hemodynamic response to exercise. Circulation. 2017; 36 (2): 231 – 237.

16. Neto GA, Pereira-Jonior PP, Mura L, Carta MG, Machado S. Effects of different types of physical exercise on the perceived quality of life in active elderly. CNS Neurol. Disord. Drug Targets. 2015; 14 (9): 1152 – 1156.

17. Bouzid MA, Hammouda O, Matran R, Robin S, Fabre C. Influence of physical fitness on antioxidant activity and malondialdehyde level in healthy older adults. Appl. Physiol. Nutr. Metab. 2015; 40 (6): 582 – 589.

18. Ingul CB. Low volume, high intensity: time-efficient exercise for the treatment of hypertension. Eur. J. Prev. Cardiol. 2018; 25 (6): 569 – 571.

19. Figueroa A, Park SY, Seo DY, Sanchez-Gonzalez MA, Baek YH.Combined resistance and endurance exercise training improves arterial stiffness, blood pressure, and muscle strength in postmenopausal women. Menopause 2021; 18 (9): 15 – 21.

20. Bateman LA, Slentz CA, Willis LH, Shields AT, Piner LW, Bales CW, Houmard JA,Kraus WE. Comparison of aerobic versus resistance exercise training effects on metabolic syndrome (from the Studies of a Targeted Risk Reduction Intervention Through Defined Exercise − STRRIDE-AT/RT). Am. J. Cardiol. 2021; 108 (6): 838 – 844.

21. Collier S, Frechette V, Sandberg K, Schafer P, Ji H, Smulyan H. Sex differences in resting hemodynamics and arterial stiffness following four weeks of resistance versus aerobic exercise training in individuals with prehypertension to stage 1 hypertension. Biol. Sex Diff. 2021); 2 (1): 1 – 7.

22. Hyeon-Soon L, Dong-Oak K. The effects of Aroma foot reflexology and foot reflexology on blood pressure, pulse rate and blood lipid level of elderly essential hypertensive patients in a

rural area". J. Korea Acad. Indust. Cooper. Soc. 2018; 13 (9): 4053 – 4064.

23. Pour AM, Dehnoalian A, Mojtabavi J. Nursing care research. J. Hayat. 2017;19 (1): 16 – 28.

24. Elmahy RM, Abdelhady AA, Hameid FA, Swify YS. Response of hypertension to laser acupuncture in obese patients. Master thesis, faculty of physical therapy, Cairo University. 2017.

25. Zhang J, Marquina N, Oxinos G, SauA, Ng D. Effect of laser acupoint treatment on blood pressure and body weight-a pilot study. J. Chiropr. Med. 2018; 7 (4): 134 – 139.

26. Missiriya S, Hassan JS, Anunncia A. Effect of Reflex Therapy on Stress and Blood Pressure among Older Adults with Hypertension. J. Pharm. Res. Intern. 2020; 32 (13): 110 – 117.