



## PREVALENCE AND RISK FACTORS OF PTERYGIUM AMONG OUTDOOR WORKERS ATTENDING AN OPHTHALMOLOGY OUTPATIENT DEPARTMENT: A CROSS- SECTIONAL STUDY

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### Abstract

**Background and Purpose:** The purpose of this study is to compare the effect of walking with diet control and step aerobics with diet control on body mass index, waist circumference and blood pressure in obese women. **METHODS:** This is an Experimental study in which 30 subjects were randomly assigned to Group A and B. Group A performed Brisk Walking with diet control. Group B performed step aerobic exercise with diet control. **CONCLUSION:** The study concludes that step aerobics with diet control is the better intervention reduce BMI, waist circumference and blood pressure in obese women as compared to walking with diet control

**Keywords:** Obesity, Step Aerobics, Brisk Walking, Body Mass Index (BMI), Diet Control

### INTRODUCTION

The prevalence of obesity and its negative health consequences are rapidly increasing, in both developed and developing countries.<sup>1,2</sup> Obesity is thus an important factor in increasing morbidity and mortality patterns. Obesity, defined as an excess accumulation of body fat, is a heterogeneous disorder with a final common pathway in which energy intake chronically exceeds energy expenditure. Obesity is increasing at an alarming rate throughout the world and has become a global problem. The World Health Organization (WHO) has declared overweight as one of the top 10 health risks in the world and one of the top five in developed nations. According to recent estimates, there are more than one billion overweight people worldwide and some 250 million are estimated to be clinically obese, which is equivalent to seven percent of the adult population.<sup>3</sup> It is also commonly believed that easy access to high fat foods and overeating are the simple causes of obesity.<sup>4</sup> General overweight and abdominal obesity are independently associated with an increased risk of heart failure (HF), whereas moderate or high levels of physical activity are associated with a reduced risk of HF. The protective effect of physical activity on HF risk is observed at all levels of body mass index.<sup>5</sup> Brisk walking is a popular and convenient form of exercise that plays an important role in weight management. It is often recommended for obese persons because it increases energy expenditure.<sup>6</sup> Hypertension is about 6 times more frequent in obese subjects than in lean men and women. The increase in blood pressure is greatest when the obesity is of abdominal distribution.<sup>8</sup> The utility of BMI and WC in



predicting obesity related health risk has been recognized by the National Heart, Lung, and Blood Institute of the National of Health (NIH), US National Institutes of Health and Health Canada obesity classification systems.<sup>9</sup>

## **METHODOLOGY**

It is an experimental study. This chapter deals with the methods used for this study. This includes information on subjects, protocol, procedure used in data collection and results of the data analysis. A sample of convenience of 30 subjects was taken. The subjects were randomly assigned to group A and B. The sample has been taken from university campus. The study included females within the age group of 21 to 30 years with the BMI  $\geq 30$ . And excluded the Subjects with Diabetes, pregnancy and who were uncooperative. Subjects with any Musculoskeletal disorders, Neurological disorders, Cardiovascular disorders and Gynecological problems. Any past abdominal surgeries done were also been excluded.

## **PROCEDURE**

For every subject baseline measurements were taken on the first day. Weight was recorded on a bathroom weighing scale. Each subject was asked to remove her shoes. The subject stood on bathroom weighing scale and distributed weight evenly on both feet and weight was recorded. Height was measured by stadiometer. Each subject was asked to remove her shoes. The back of the head, back, buttocks, calves and heels were touching the wall. The feet were kept together. The subject was asked to look straight and height was recorded. Waist circumference measurement was taken by inch tape. It was measured at a level midway between the lower rib margin and iliac crest with the tape all around the body in horizontal position. Each subject was asked to breathe normally and the reading of the measurement was taken at the end of gentle exhaling. Blood pressure was measured by sphygmomanometer. For blood pressure measurement, an inflatable cuff was placed around the upper arm at roughly the same vertical height as the heart with the subject sitting comfortably. Diet chart was prescribed by a dietician for all the subjects in both groups which was followed by them for 10 weeks.

### **Group A**

The group A performed brisk walking with diet control. Walking was done 5 days per week for 45 minutes per session in the morning. The session was preceded by a 10 minute warm-up and followed by a 5 minute cool down. The subjects were asked to walk on a plain grass ground which covers the distance of 400 meters, continuously for 45 minutes. In 45 minutes, the subjects had to complete 12 rounds of 400 meters. Each round of 400 meters was completed in approximately 3.75 minutes. Each session consisted of 1 hour per day.

### **Group B**

The group B performed step aerobic exercise with diet control. Exercise session was performed under the supervision of an aerobic instructor in gymnasium. Step height of 4 inches was used for the session.<sup>7</sup> Step patterns included were basic right step, basic left step, turn step, step over, alternating basic step, V step, step touch and high knee step.<sup>18</sup> The exercise sessions were held 5 days per week for 45 minutes per session in the morning. Step exercise session was preceded by a 10 minute warm-up and followed by a 5 minute cool down. Each session consisted of 1 hour per day. The subjects did step aerobics continuously for 45 minutes in the gymnasium. 118-122 bpm music beats were played for the aerobic session (refer appendix C for details of the protocol). The subjects were asked to keep head up, shoulders down and back, chest up and abdominals lightly contracted. The subjects were instructed to not to hyperextend the knees or back at any time during the session.



When stepping up, the subjects were asked to lean from the ankles and not the waist, to avoid excessive stress on the lumbar spine and were asked to make contact with the entire sole of the foot. To avoid Achilles tendon injury, the subjects were asked to not to allow the heel to land over the edge of the step. Steps were done softly and quietly to avoid unnecessary high impacts. The subjects were instructed to look at the platform periodically to ensure proper foot placement. While stepping down, the subjects were made to step close to the step (no more than one shoe length away) and the heels were allowed to touch the floor to help absorb shock. At the end of 10 weeks, all the measurements were taken similarly as done on the first day of the session. Weight was recorded on a bathroom weighing scale. Waist circumference measurement was taken by inch tape. Blood pressure was measured by sphygmomanometer. The readings were compared as taken on first day and at the completion of 10 weeks.



GROUP A



GROUP B

#### DATA ANALYSIS:

Between group analysis i.e. between group A and B, was evaluated by using unpaired t-test to compare the effects of both the interventions, walking with diet control and step aerobics with diet control, on body mass index, waist circumference and blood pressure. The level of statistical significance was set at  $p < 0.05$ . SPSS software was used for analysis. Refer to appendix E for sample data analysis.

#### RESULTS

This chapter deals with the results of the data analysis to analyse the effect of the two interventions on body mass index, waist circumference and blood pressure. The group A has been given walking with diet control and consists of 15 subjects. The group B has been given step aerobics with diet control and consists of 15 subjects.



**Table 1: Baseline measurements of the subjects**

	Group A	Group B	t value	$p \leq 0.05$
No. of subjects (n = 30)	15	15	-	-
Age (in years) *	23.533 ± 1.995	23.2 ± 1.521	0.515	Not significant
BMI (kg/m <sup>2</sup> )	32.45 ± 2.060	31.79 ± 0.779	1.168	Not significant
WC (cm)*	88.47 ± 8.312	88.03 ± 7.770	0.883	Not significant
BP (mmHg)* (systolic)	124.93 ± 3.283	124.93 ± 3.195	1.000	Not significant
BP (mmHg)* (diastolic)	84.13 ± 2.669	83.73 ± 2.251	0.660	Not significant

mean ± standard deviation

The baseline characteristics of the subjects participating in this study Le number of subjects, age and BMI are shown in table 1

The table depicts the mean age ± standard deviation of group A = 23:53 + 1995 and group B = 232 ± 1521. The t value (unpaired test) for age between group A and B is 0.515 which is less than table value of 2.05 at df 28. p value is also > 0.05

The mean BMI ± standard deviation of group A = 32 45 ± 2.060 and group B = 31 790779 The t value (unpaired test) for age between group A and B is 1.168 which is less than table value of 2 05 at df 28 p value is also > 0.05

The mean WC ± standard deviation of group A = 88.47 ± 8 312 and group B = 88.03 ± 7.770 The t value for WC between group A and B is 0.883 which is less than table value of 2.05 at df 28 p value is also > 0.05

The mean BP (systolic) ± standard deviation of group A = 124 93 ± 3.283 and group B = 124.93 ± 3.195. The t value (unpaired test) for age between group A and B is 1.000 which is less than table value of 2 05 at df 28 p value is also > 0.05

The mean BP (diastolic) ± standard deviation of group A = 84 13 +2 669 and group B = 83 73 ± 2251 The t value (unpaired test) for age between group A and B is 0.660 which is less than table value of 2 05 at df 28: p value is also > 0.05

Thus, both the groups are matched for their baseline characteristics

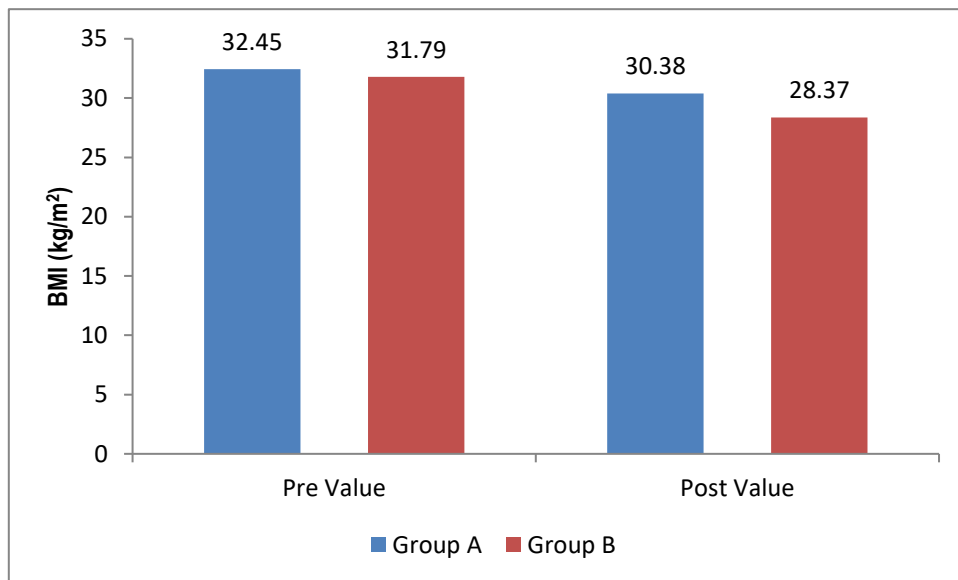
**Table 2: Pre and post measurements of group A and B (within group analysis)**

Outcome measures	Pre – values (mean ± SD)	Post – values (mean ± SD)	t value	$p \leq 0.05$
BMI				
Group A	32.45 ± 2.060	30.38 ± 1.945	20.757	significant
Group B	31.79 ± 0.779	28.37 ± 0.812	32.013	significant
WC				
Group A	88.47 ± 8.312	85.87 ± 7.891	7.675	significant

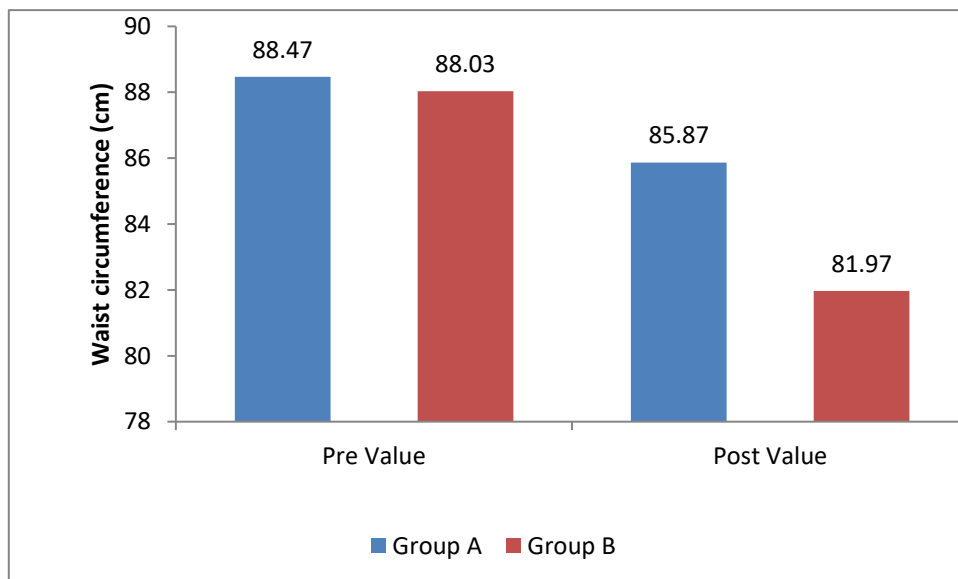


Group B	88.03 ± 7.770	81.97 ± 7.788	16.785	significant
BP (systolic)				
Group A	124.93 ± 3.283	122.67 ± 2.895	8.500	significant
Group B	124.93 ± 3.195	120.67 ± 0.976	5.670	significant
BP (diastolic)				
Group A	84.13 ± 2.669	82.27 ± 2.712	6.089	significant
Group B	83.73 ± 2.251	80.53 ± 0.915	6.287	significant

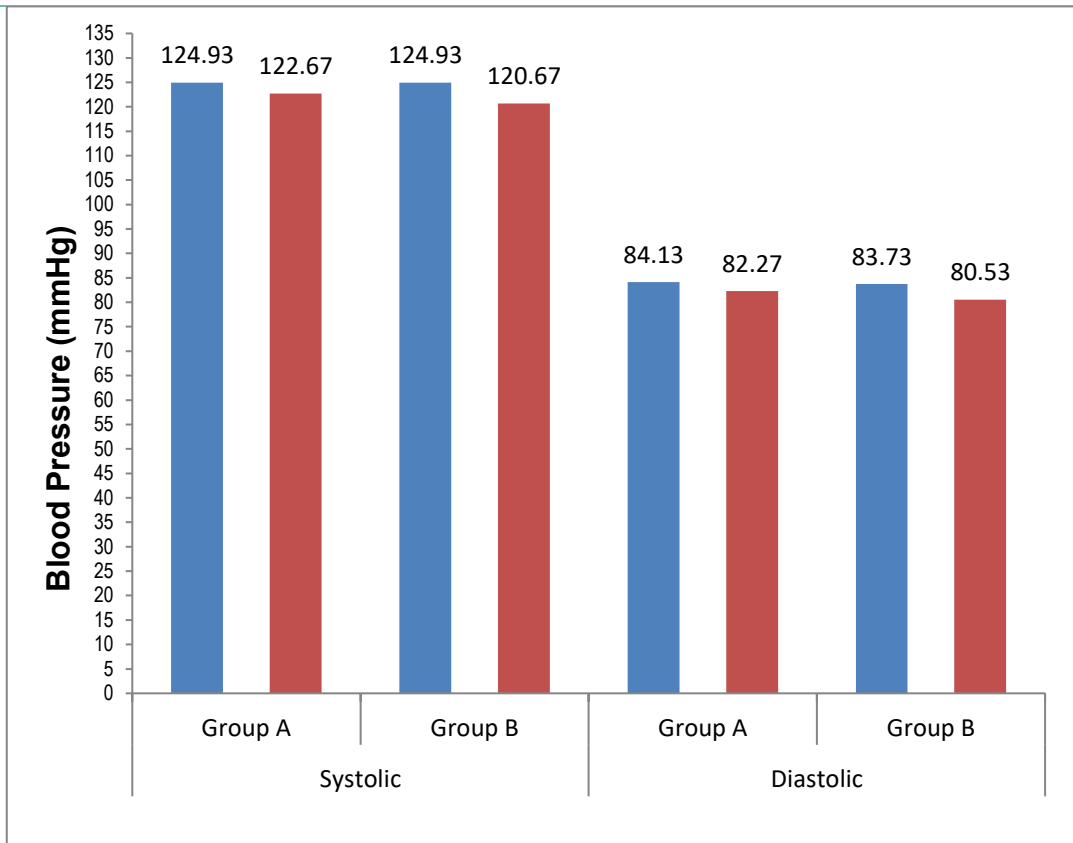
BMI, WC and BP show significant results in both the groups when pre and post measurements are compared. Calculated t value (paired 1-test) is more than table value of 2.14 at df 14 p value is also  $\leq 0.05$



**Figure 1: Comparison of pre and post values of BMI within group A and B**



**Figure 2: Comparison of pre and post values of WC within group A and B**



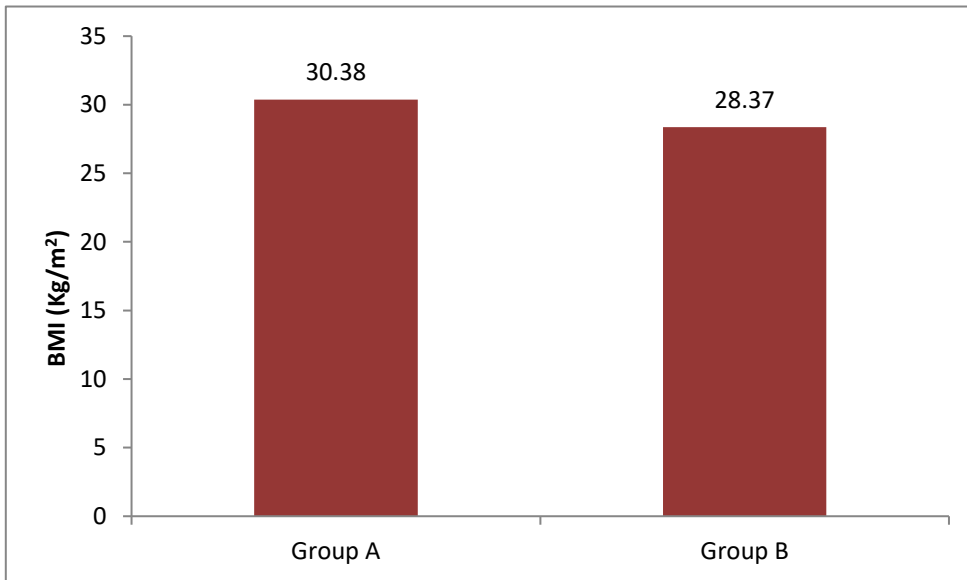
**Figure 3: Comparison of pre and post values of BP within group A and B**

**Table 3: Mean values  $\pm$  SD to compare changes between the groups (between group analysis)**

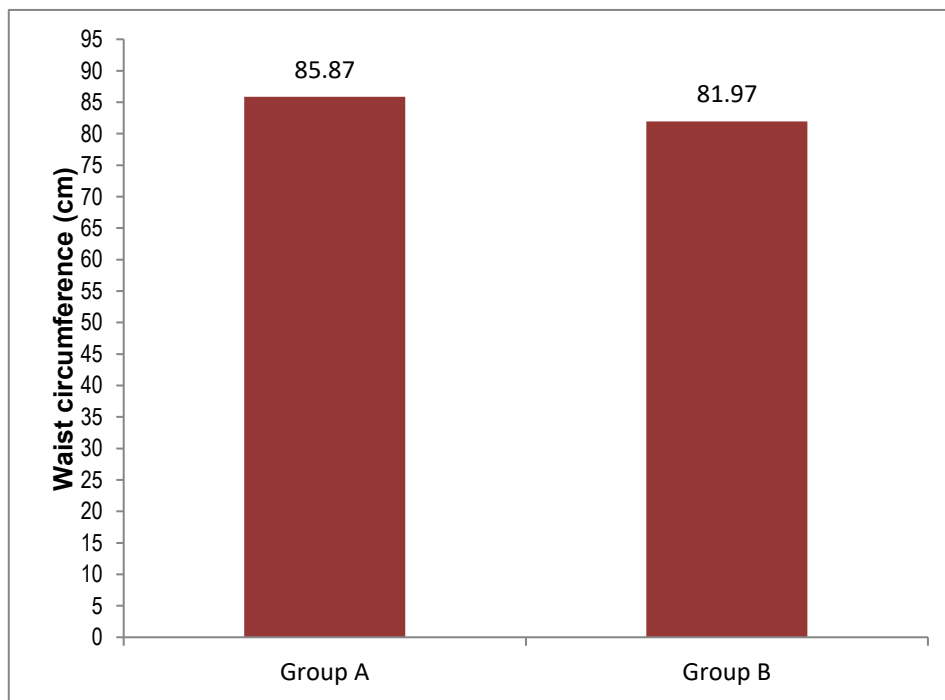
		BMI	WC	BP (S)	BP (D)
Group A	Pre values (mean $\pm$ SD)	32.45 $\pm$ 2.060	88.47 $\pm$ 8.312	124.93 $\pm$ 3.283	84.13 $\pm$ 2.669
	Post values (mean $\pm$ SD)	30.38 $\pm$ 1.945	85.87 $\pm$ 7.891	122.67 $\pm$ 2.895	82.27 $\pm$ 2.712
	Mean difference (mean $\pm$ SD)	2.08 $\pm$ 0.387	2.60 $\pm$ 1.312	2.27 $\pm$ 1.033	1.87 $\pm$ 1.187
Group B	Pre values (mean $\pm$ SD)	31.79 $\pm$ 0.779	88.03 $\pm$ 7.770	124.93 $\pm$ 3.195	88.73 $\pm$ 2.251
	Post values (mean $\pm$ SD)	28.37 $\pm$ 0.812	81.97 $\pm$ 7.788	120.67 $\pm$ 0.976	80.53 $\pm$ 0.915
	Mean difference (mean $\pm$ SD)	3.42 $\pm$ 0.414	6.07 $\pm$ 1.400	4.27 $\pm$ 2.915	3.20 $\pm$ .971
	t value	9.184	6.998	2.505	2.244
	p $\leq$ 0.05	significant	Significant	significant	significant



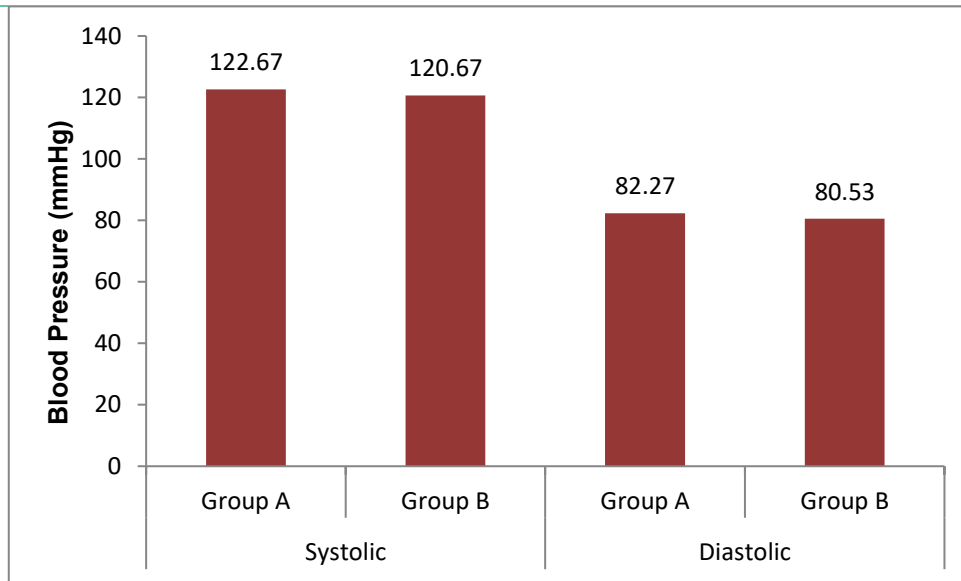
There is a significant difference between both the groups with respect to BMI, WC, BP. Calculated t value (unpaired t- test) is greater than table value of 2.05 at df 28. p value is also  $\leq 0.05$ .



**Figure 4: Comparison of post BMI values between group A and B**



**Figure 5: Comparison of post waist circumference values between group A and B**



**Figure 6: Comparison of post blood pressure values between group A and B**

## DISCUSSION

The present study was done to compare the effects of two interventions i.e. walking with diet control and step aerobics with diet control, in obese women. The results showed that step aerobics with diet control is a better strategy to reduce body mass index, waist circumference and blood pressure as compared to walking with diet control. Various studies have showed that step aerobics and walking, alone, leads to reduction in BMI and waist circumference. Diet modification alone has a significant contribution in reducing BMI and WC in obese women. Many studies have proved that aerobic exercise along with diet modifications is the best approach to reduce BMI and WC in obese women.<sup>11,15,18</sup> Weight loss was more than 3 times as great in those studies in which subjects consumed a combination low-fat, high-fibre diet (3.4 kg over 6 months) compared with a low-fat diet alone (1.0 kg over 6 months), which suggests additive effects of fat and fibre in weight loss.<sup>12</sup> Walking is a popular and convenient form of physical activity that holds great promise for weight management. Approximately 71million American adults walk for exercise. Brisk walking is often recommended for obese persons because it increases energy expenditure. Regular brisk walking improves several known risk factors for cardiovascular disease.<sup>13</sup>

In study done by Akdur et al, no significant difference was seen b/w gps for BMI and WC values, in walking with diet control and step aerobic with diet groups, when intervention was given for 3 days/week for 10 weeks. So, it can be inferred that 5 days/week intervention is better than 3 days/week intervention given for same duration i.e. 10 weeks, in getting a significant difference between the two interventions i.e. walking with diet control and step aerobic with diet. Also energy consumption in step aerobic exercise is higher than in walking which is helpful in supporting the results of this study regarding BMI and WC.<sup>11</sup> Greater Whelton et al conducted a meta-analysis to determine the effect of aerobic exercise on blood pressure and stated that an increase in aerobic physical activity should be considered as an important component of lifestyle modification for prevention and treatment of high blood pressure.<sup>14</sup> BMI is known to be the standard measure for obesity. Also, WC is a routinely used anthropometric variable to identify health risks of obesity. It has been shown that BMI and WC independently contribute to the prediction of total body fat in obese women. So, the outcome measures used in this study are appropriate.



## Limitations

This study has some limitations such as only females were taken so the results cannot be generalized to the whole population. Moreover, activities of daily living, with the exception of exercise training, were not controlled.

## CONCLUSION

The study concludes that step aerobic with diet control is the better intervention reduce BMI, waist circumference and blood pressure in obese women as compared to walking with diet control.

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