

## **The Effect of Aerobic Exercise versus Strength Training In Reducing Weight in Overweight PCOS Women**

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**Abstract**

**AIM:** The aim of the study to find out the effect of aerobic exercise and strength training in reducing weight in overweight PCOS women. **BACKGROUND:** The PCOS is common problem which affect women in the age of 18-40 years. It is due to altered lifestyle and reduced physical activity which leads to obesity and other health issues. **METHOD:** 30 women's with the age group of 18 to 22 are selected for the study and they are separate into 2 groups each group contain 15 women's. One group of women perform the aerobic exercise and other group of women perform strength training for 3 days a week for 8 weeks. The pre-test and post-test values are taken by the outcome measure used for the study are BMI and WHR. **RESULT:** The mean value shows aerobic exercise is more effective than strength training in reducing weight in overweight PCOS women. **CONCLUSION:** The study concludes that both aerobic exercise and strength training are effective in reducing weight in overweight PCOS women.

**Keywords:** PCOS, Overweight women, BMI, WHR, Aerobic exercise, Strength training

## INTRODUCTION:

Polycystic ovary syndrome is a complex condition characterised by elevated androgen level, menstrual irregularities, and small cyst on one or both ovaries.<sup>[1]</sup> Polycystic ovary syndrome is a heterogeneous condition which related to an endocrine reproductive and metabolic disorder of female.<sup>[2]</sup> The incidence of polycystic ovary syndrome in Indian adolescents ranging from 2.2% to 26% between the ages of 18 to 45 years.<sup>[3]</sup> The incidence of PCOS in worldwide according to WHO is 116 million women's that is 3.4% in the year of 2012.<sup>[4]</sup>

The cause of PCOS includes excessive production of androgens and low level of follicle stimulating hormone, this abnormality which leads to ovarian dysfunction. It is also because of hereditary in some cases; it is also caused by unbalanced release of FSH and LH by the pituitary.<sup>[5]</sup>

The pathophysiology of PCOS includes the following decreased FSH secretion and increased LH secretion by the pituitary leads impaired development of follicles in the ovary which may cause chronic anovulation, hyperandrogenism. This will lead to hirsutism, acne, and alopecia and also lead to hyperinsulinemia or insulin resistance this will cause obesity in the adipose tissue.<sup>[5]</sup>

The symptoms of PCOS according to NHS are irregular periods or no periods at all, difficulty in getting pregnant, weight gain, thinning of hair or hair loss, and oily skin. The risk factor for PCOS are type 2 diabetes, high blood pressure, high cholesterol, depression, sleep apnoea.<sup>[6]</sup> The PCOS should be diagnosed according to Rotterdam Criteria which includes the following irregular menstrual periods, excessive androgen production, and polycystic ovary on ultrasound.<sup>[7]</sup>

Obesity is defined as a condition of abnormal or excessive fat accumulation in adipose tissue, to extent that health is impaired. Obesity and overweight lead to several diseases such as hypertension, diabetes and cardio vascular disease.<sup>[8]</sup> Obesity is very common clinical feature in women affected by PCOS.in fact approximately 50% of PCOS women are overweight or obese and the history of the weight gain frequently precedes the onset of oligo menorrhoea and hyperandrogenism, suggesting a pathogenetic role of obesity in the subsequent development of the syndrome.<sup>[9]</sup> Aerobic exercise is defined as “any activity that uses large muscle groups, can be maintained continuously, and rhythmic in nature.”<sup>[10]</sup>

Aerobic exercise will have an effect on PCOS include reduce weight, reduce depression and anxiety, improve frequency of menstrual cycle and ovulation.

Strength training is the type of exercise that requires the body to push against force that is practised against it. <sup>[11]</sup>Resistance training will help to reduce insulin resistance, increasing metabolic rate, improving body composition.

The WHR has been used as an indicator or measure of health .Waist to hip ratio (WHR) is the dimensionless ratio of the circumference of the waist to that of the hips. This is calculated as waist measurement divided by hip measurement. The WHO states that abdominal obesity is defined as a WHR above 0.90 for males and above 0.85 for females.

Body Mass Index (BMI) is a person's weight in kilograms divided by the square of the height in meters. BMI can be used to screen for weight categories that may lead to health problems but it is not diagnostic of the body fat.

#### **METHODS AND MATERIALS:**

The study conducted in School of physiotherapy, VISTAS Thalambur. The study design is experimental and comparative study.30 samples are used in this study the samples are selected by random sampling technique .Study duration was 8 weeks. The inclusion and exclusion criteria for the study as follow;

##### **INCLUSION CRITERIA:**

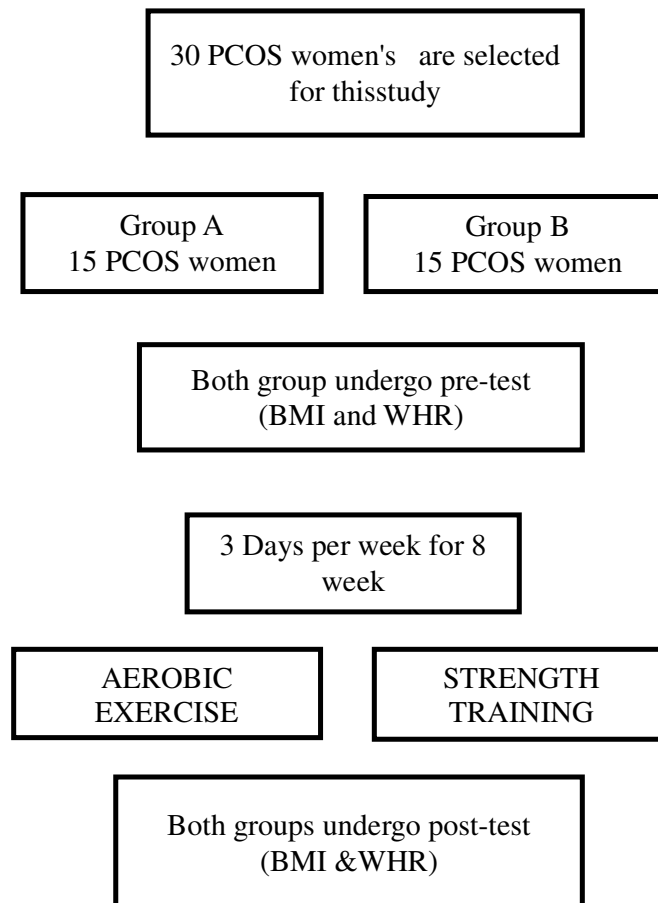
- PCOS women clinically diagnosed by clinician.
- Age: 18-25 years
- BMI: above 25 – 30 kg/m<sup>2</sup>
- WHR: above 0.8 inches
- Who are willing to participate

##### **EXCLUSION CRITERIA:**

- Who are not willing to participate in this study
- Any recent surgeries
- Normal body mass index
- Liver dysfunction
- Cardiovascular disease

The outcome measures used for the study are BMI and WHR.It is mainly for measure the obesity. Obesity is a common problem in the PCOS women due to hormonal imbalance.

All the participants were informed about the purpose of the study before start the study. All the procedures were explained to the participants prior to the study. 30 participants were participated in the study. Before the women allocated into groups, the diet management should be administered, that includes energy restricted, high protein diet (5000-6000 kj/d).<sup>[30]</sup> 30 participants were randomly allocated in two groups. Group A (Aerobic exercises) and Group B (Strengthening exercise) with 15 participants in each group .Both groups are advised to take less calories and some diet restriction should be provided. Participants in Group A advised to perform 3 days per week for 8 weeks aerobic exercise programme while Group B participants advised to do strengthening exercise. Before and after, 8 weeks of exercise program the pre and post-test should be carried out for data analysis.



**GROUP A (AEROBIC EXERCISES):**

The exercise should done by the group A are described in (Table 1).The activity intensity was measured by 60% maximum heart rate of individual using  $\text{Age}-220 \times 60/100$ <sup>[13]</sup> .(Figure 1 and 2)

**GROUP B (STRENGTH TRAINING):**

The exercise should done by the group A are described in (Table 2).Each exercise done by 3 sets for 12 repetition.<sup>[14]</sup> (Figure 3 to 14)

**DATA ANALYSIS:**

Data was analysed by SPSS statistics software version 25. The values of pre and post-test of BMI and WHR in group A are listed in the table 3 the graphical representation of this in graph 1 and 2 .At the same way pre and post-test BMI and WHR in Group B are listed in the table 4 the graphical representation of this in graph 3 and 4.Atlast compare the both WHR and BMI in group A and B are listed in the table 5 and 6 for this graph is 5 and 6.

**RESULTS:**

The result shows both aerobic and strength training has significant effect in reducing weight in overweight PCOS women ( $p \leq 0.001$ ). The mean value shows aerobic exercise is more effective than strength training in reducing weight in overweight PCOS women.

**DISCUSSION:**

Polycystic ovary syndrome is the most common endocrine disorder in women characterized by chronic anovulation polycystic ovaries and hyperandrogenism. PCOS affects about 5-10% of women of childbearing ages. Insulin resistance has an important role in the pathophysiology of this syndrome and obesity. Weight loss can improve endocrine and metabolic disorders such as glucose intolerance in PCOS. It is usually recommended to lose weight up to a body mass index of less than  $30 \text{ Kg/m}^2$  in obese women with PCOS before initiating pharmacological treatment. With gradual decrease in body weight and abdominal fat insulin sensitivity increases and ovulation restores in overweight or obese women with PCOS. Weight loss also improves fertility in PCOS.<sup>[15]</sup>

In this study there is a significant improvement following 8 weeks of aerobic exercise. Consider with our study **Mohammad Reza Kordi et al.(2011)** states that Aerobic exercise program improved in clinical symptoms and physical fitness and reduced fasting insulin and serum androstenedione in young PCOS women. <sup>[16]</sup> **Hephzibah Kirubamani N et al. (2018)** states that Aerobic exercise improves cardiorespiratory capacities and obesity indices in women with PCOS. <sup>[18]</sup> 16 weeks of aerobic exercise improves quality of life and mainly because of reduction in abdominal obesity and regularization of menstrual pattern and restoration of ovulation. <sup>[17]</sup>

In this study there is a significant improvement following 8 weeks of strength training. Consider with our study **Ida Almenning (2014)** Progressive resistance training effectively improved hyperandrogenism reproductive function and body composition in women with PCOS. The decrease in waist circumference and increased lean muscle mass underscore the fact that weight reduction need not to be end point of exercise. <sup>[18]</sup> **Paraskevi Pericleous (2018)** Both HIIT and ST were beneficial effect on body composition in women with PCOS . The study states that, the exercise without weight loss can be encouraged that they will be achieving health benefits. <sup>[19]</sup>

## CONCLUSION:

The study concludes that both aerobic exercise and strength training are effective in reducing weight in overweight PCOS women. But in compare with the groups, aerobic exercise is very effective than strength training in reducing weight on overweight PCOS women.

## LIMITATIONS:

- Study sample was small
- Study duration was short period
- Study conducted with only 2 outcome measures
- Diagnosis of PCOS remains challenge because of overlapping of symptoms PCOS with normal pubertal changes.
- The awareness about the condition PCOS among general public is low so that very difficult to select the population for the study.

**RECOMMENTATIONS:**

- Future study done with large samples
- Follow up studies can be performed to understand about the long term effect of the exercises can be used with more outcome measures.
- Future study should be done to increase the quality of life by doing exercise

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