

Effect of Aerobic Exercise Training on Body Mass Index and Quality of Life in Adult Obese Women with Polycystic Ovary Syndrome

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ABSTRACT

Polycystic ovary syndrome (PCOS) is a common endocrine dysfunction, characterized by chronic anovulation, and ovarian dysfunction affecting 8% to 13% of women in all reproductive age groups. The process of menstrual irregularities is associated with higher Body Mass Index and reduced Quality of Life. The study was a single group experimental design. The study was conducted on 20 obese adult subjects aged 18-25 years based on inclusion and exclusion criteria. The study duration was 6 months and the treatment duration about 40 - 60 minutes per session, 3 sessions per week for 12 weeks. Body mass index was assessed by using Body Mass Index chart and Quality of Life is assessed using Short Form-36 Questionnaire. The study concludes that Aerobic Exercise was effective in reducing the Body Mass Index and improving the Quality of Life thereby regulating the Menstrual Cycle among adult obese women with Polycystic Ovary Syndrome after the intervention sessions.

Keywords: Aerobic Exercise, Body Mass Index, Short Form 36 Questionnaire, polycystic ovary syndrome.

INTRODUCTION

One of the most common endocrine disorders is polycystic ovary syndrome. It is recognized by the presence of enlarged ovaries with small cyst and a hypervascularised, androgen secreting stoma (WHO). Polycystic Ovary Syndrome is an endocrine disorder prevalent among young women affecting their health, quality of life and their mental well-being as well [1]. Polycystic Ovary Syndrome, or Stein-Leventhal syndrome, is a complicated condition that involves elevated androgen levels and irregular menstrual cycles. Polycystic Ovary Syndrome clustering is similar to that of an autosomal dominant pattern. It affects approximately 25% of

patients. Polycystic Ovary Syndrome often results in overweight and obesity among both adolescents and adults [2].

An irregular menstrual cycle can lead to higher blood pressure, a higher body mass index, and lower insulin sensitivity. Increasing insulin levels will cause suppression in ovulation, which will disrupt the menstrual cycle [3]. The best ways to lower body mass index are through exercise and a nutritious diet that burns calories. Reduction of even a modest amount of weight can help lessen the symptoms of Polycystic Ovary Syndrome, such as regular menstrual cycles and ovulation.

Physiotherapy is a vital component in treating Polycystic Ovary Syndrome [4]. The

following are some examples of physiotherapeutic exercises that involves stretching, core strengthening, plyometric, and aerobic workouts. An aerobic exercise program helps young women with polycystic ovary syndrome with their anthropometric measurements, metabolism, and hormonal profile. Among the aerobic exercise, examples include brisk walking, jogging, dancing, cycling, side lunges, elbow to knee, walking backward and forward, squats, tap backs, and rocket jumps [5].

Body Mass Index is defined as the individual's body weight (kg) divided by the square of height(m²). The formula universally used in medicine provides a unit of measure of kg/m² [6]. The majority of women state that their worries about their weight have the biggest influence on their quality of life. In cases of polycystic ovary syndrome, factors such as increased body mass index, irregular menstruation, marital status, and educational attainment significantly impact Quality of Life. As such, psychological support is essential during patient care. Quality of life is evaluated using Short Form-36 questionnaire. The SF- 36 is the empirically validated short form of outcome assessment instruments developed for this study. The SF- 36 assesses 8 subscales of the health-related quality of life, or subjective health, which are conceptually subsumed in the areas of “physical” and “mental” health [7].

MATERIALS & METHODS

Students in the KG college were given notification & those who are interested, registered their names in the Physiotherapy and Rehabilitation center, of KG College of Physiotherapy. Among 70 adult women 30

were diagnosed with Polycystic Ovary Syndrome and 20 were sorted out based on the inclusion and exclusion criteria were selected for the study. Instructions were given to the subjects about the study and procedures. Before the intervention, informed consent forms were filled by the subjects. Subjects were allocated in a single group.

The training course included 3 sessions per week each lasting 40-60 minutes. The first 5-6 minutes in each session was for warm up, the next 30-45 minutes for exercise and last 5-7 minutes for cooling down.

Warm up exercise included walking, jogging, stretching, rotation at various joints, walking on heels and toes, forward bend, backward bend, sideward stretch, rotation of shoulder joints and hip joints, stretching of calf and quadriceps muscle groups.

Between sessions the participants had 5-7 minutes active resting period.

At the end of each one, slow stretching exercises were performed to return the body to initial stage. [13].

The subjects were instructed to these following exercises:

- Jumping jacks
- High knees
- Alternate side lunges
- Skipping

STATISTICAL ANALYSIS

Statistical analysis was done by using Paired ‘t’ test.

The paired ‘t’ test was used to find out the statistical significance in pretest and posttest of the PCOS subject’s Body Mass Index and Quality of Life improved by Aerobic Exercise Training.

TABLE: I COMPARISON OF PRE-TEST AND POST-TEST VALUES OF BODY MASS INDEX SCALE FOR AEROBIC TRAINING.

S.NO	BODY MASS INDEX	MEAN	MEAN DIFFERENCE	STANDARD DEVIATION	Paired 't' value
1.	Pre test	26.33	2.165	0.444	13.221
2.	Post test	24.16		0.722	

It shows the analysis of Body Mass Index Scale. The paired ‘t’ test with 19 degree of freedom with pre versus post session value

of 13.221 at 0.05 level of significance which was greater than the tabulated value of 2.093. This showed that there was a

statistical significance difference in between pre versus posttest values.

GRAPH - I

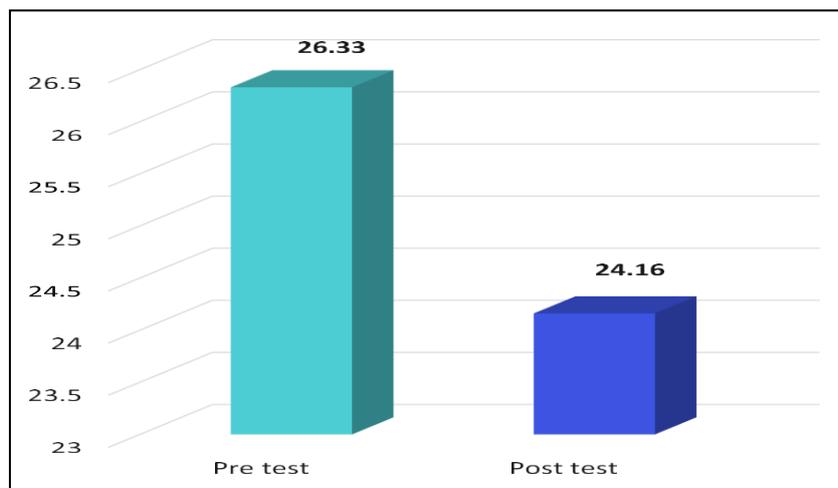


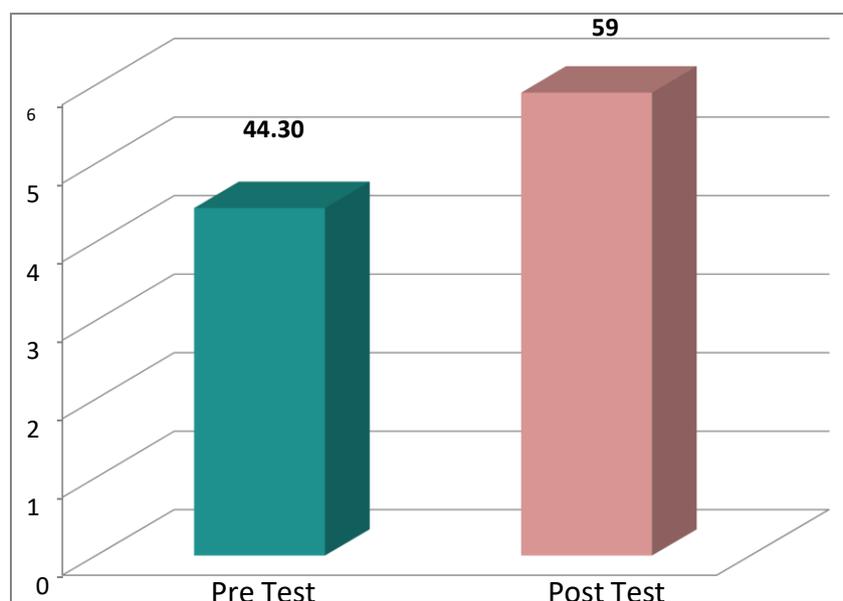
TABLE: II COMPARISON OF PRE TEST AND POST TEST VALUES OF SHORT FORM - 36 QUESTIONNAIRE SCORE FOR AEROBIC TRAINING.

S.NO	SHORT FORM - 36	MEAN	MEAN DIFFERENCE	STANDARD DEVIATION	Paired 't' value
1.	Pre test	44.30	14.7	2.54	18.412
2.	Post test	59		3.68	

It shows the analysis of Short Form - 36. The paired 't' test with 19 degrees of freedom with pre versus post session value of 18.412 at 0.05 level of significance which

was greater than the tabulated value of 2.093. This showed that there was a significance difference in between pretest Versus posttest values.

GRAPH-II



RESULT

Total 20 subjects were conveniently selected. Age group of subjects are between 18-25 years. Using Body Mass Index to

measure the Body Weight and using the Short form 36 Questionnaire to measure the Quality of Life of the subjects. Pretest is

taken before the intervention and Post test is taken after the intervention sessions.

The paired 't' test analysis for the pretest and post-test variables of body mass index scale with Polycystic Ovary Syndrome which has shown in table I. The groups show significant difference in pretest and post-test values. The 't' value for group I is 13.221.

The paired 't' test analysis for the pretest and post-test variables of short form 36 health survey questionnaire with Polycystic Ovary Syndrome which was shown in table II. The groups show significant difference in pretest and post values. The 't' values for group I is 18.412.

Even though statistical analysis revealed that there is statistically significant improvement in pre and post of the group in body mass index and Short Form -36 questionnaire.

DISCUSSION

The objectives of this study were to find out the improvement by regulating the menstrual cycles by aerobic exercise training on Body Mass Index and Quality of Life in subjects with Polycystic Ovary Syndrome. A total of 20 Polycystic Ovary Syndrome subjects in the age group of 18-25 years participated in this study. The participants who fulfilled the selection criteria were conveniently assigned into one group.

Aerobic Exercise were given to this group. Measurements were taken at baseline using body mass index scale and Short Form-36 questionnaire. Subjects who fulfilled the selection criteria received aerobic training for the period of 12 weeks. At the end of 12th week, the subjects were evaluated using the outcome measures as mentioned above. Aerobic exercises which include Jumping jacks, High knees, Alternate side lunges, Skipping were used which reduces the Body Mass Index and improves quality of life thereby reducing the menstrual cycle. Aerobic Exercise Training can help in reducing the Body Mass Index thereby regulating menstrual cycles by reducing stress and maintaining a healthyweight, both

of which can impact the regularity of periods. Exercise can also enhance insulin sensitivity and reduce inflammation, which aids in menstrual cycle regulation. The impact of aerobic exercise training regulates hormones and anti-oxidant adaptations^[8].

Not only do ovarian hormones vary, but adrenal cortical hormones, including aldosterone, also show cyclic activity due to inadequate progesterone, which functions as an antagonist to aldosterone^[9]. The elevation of serum progesterone levels during aerobic exercise is significantly increased through prolonged fasting before exercise, which can be prevented.^[10]

This increase in progesterone may not be enough to significantly alter the menstrual cycle. Increased aerobic exercise may also help to improve blood glucose and insulin sensitivity in women, possibly by decreasing the intensity of menstrual symptoms.^[11] Aerobic Exercise training induce intramyocellular lipid in the skeletal muscle. Intramyocellular lipid is increased in obesity and type 2 diabetes and is related to insulin resistance^[12].

When the body weight is reduced simultaneously Quality of life gets improved. Thus, the statistical results showed that there was a significant difference between the pretest and posttest values of body mass index and Short Form-36.

CONCLUSION

The aim of the study was to find the effect of aerobic exercise training on Body Mass Index and Quality of Life in adult obese women with Polycystic Ovary Syndrome. The subjects were selected based on inclusion and exclusion criteria. A detailed examination was done by Gynecologist, senior physiotherapist for inclusion of the participants for the study. 20 subjects of age group of 18 to 25 years were selected purposive for the study.

The study concludes that Aerobic Exercise was effective in reducing the Body Mass Index and improving the Quality of Life thereby regulating the Menstrual Cycle

among adult obese women with Polycystic Ovary Syndrome after the intervention sessions. This study includes a small age group, other biomarkers of body can be assessed in the future studies

Declaration by Authors

Ethical Approval: The study was approved by the college committee, K.G. College of Physiotherapy, Coimbatore.

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