



ISSN Print: 2664-7559
ISSN Online: 2664-7567
Impact Factor (RJIF): 8.19
IJSHPE 2025; 7(2): 269-272
www.physicaleducationjournal.in
Received: 15-07-2025
Accepted: 18-08-2025

M Rakshini
Physiotherapist, Sri
Ramakrishna College of
Physiotherapy, Coimbatore
Tamil Nadu, India

Dr. Ahamed Thajudeen
M.P.T (Sports), PhD.
Professor, College of
Physiotherapy, Sri
Ramakrishna Institute of
Paramedical Sciences,
Coimbatore, Tamil Nadu,
India

Effect of high-intensity interval training on women with polycystic ovarian syndrome

M Rakshini and Ahamed Thajudeen

DOI: <https://doi.org/10.33545/26647559.2025.v7.i2d.258>

Abstract

Polycystic Ovary Syndrome (PCOS) is a common endocrine disorder that negatively impacts women's quality of life, physical health, and mental well-being. This study aimed to evaluate the effect of high-intensity interval training (HIIT) on these outcomes in women with PCOS. Twenty participants underwent a 30-minute HIIT treadmill program on alternate days for 8 weeks. Quality of life and health status were assessed using the PCOS-Q and SF-36 questionnaires before and after the intervention. Results demonstrated significant improvements in quality of life, physical health, and mental health. These findings suggest that HIIT is an effective therapeutic approach for managing PCOS and highlight the importance of regular physical activity in improving overall health outcomes.

Keywords: Polycystic Ovary Syndrome (PCOS), High-Intensity Interval Training (HIIT), Quality of Life, Physical and Mental Health, Exercise Intervention

Introduction

Polycystic Ovary Syndrome (PCOS) is a common endocrine disorder affecting reproductive-aged women, characterized by menstrual irregularities, hyperandrogenism, and metabolic complications such as obesity, insulin resistance, and increased cardiovascular risk. Beyond physical symptoms, PCOS is linked to psychological challenges, including anxiety and depression, which reduce quality of life. Regular physical activity, particularly High-Intensity Interval Training (HIIT), has emerged as an effective non-pharmacological intervention to improve insulin sensitivity, hormonal balance, reproductive function, and emotional well-being. Standardized tools such as the PCOS-Q and SF-36 are widely used to assess improvements in health-related quality of life, with evidence showing significant benefits of HIIT for women with PCOS.

HIIT (High-Intensity Interval Training)

High-Intensity Interval Training (HIIT) is a well-established therapeutic intervention for improving both physical health and mental well-being in women with Polycystic Ovary Syndrome (PCOS). International guidelines recommend regular physical activity, particularly HIIT, for women with PCOS. HIIT, characterized by short bursts of intense exercise alternated with low-intensity recovery periods, has been shown to improve cardiovascular fitness, insulin sensitivity, and reduce androgen levels, thereby alleviating symptoms such as irregular menstruation.

Quality of Life: The Polycystic Ovarian Syndrome Symptom Questionnaire (PCOS-Q) is used to measure the physical, emotional, and social impact of PCOS on women.

Physical and Mental Well-Being: Women with PCOS often face both physical and mental health challenges. In addition to managing symptoms like irregular periods, acne, and excessive hair growth, many experience psychological issues such as anxiety, depression, and low self-confidence due to the cosmetic and reproductive aspects of PCOS.

Short Form Health Survey (SF-36): The SF-36 Health Survey is a reliable and valid tool used to measure overall health status and quality of life across different populations, including women with PCOS.

Corresponding Author:
M Rakshini
Physiotherapist, Sri
Ramakrishna College of
Physiotherapy, Coimbatore
Tamil Nadu, India

Materials and Methods**Materials Required**

- Consent form
- Assessment form
- Weight machine
- Height chart
- Exercise mat

Methodology**Study Design**

This is single group study done by comparing pre-test and post-test study design.

Study Setting

Sri Ramakrishna Hospital, Coimbatore-6414044.

Sampling Method

Purposive sampling method.

Selection Criteria**Inclusion Criteria**

- Age group of 18-28 were included in the study
- Clinically confirmed diagnosis of PCOS by ultrasound
- BMI $\geq 18.5\text{kg/m}^2$ and $< 40\text{kg/m}^2$
- Oligomenorrhea (Irregular menstruation)
- Amenorrhea (Absence of menstruation)

Exclusion Criteria

- Fertility treatment
- Oral contraceptives
- Pregnancy
- Recent major surgeries
- Reproductive disorders unrelated to PCOS
- History of cardiovascular and respiratory diseases

Study Duration

8 Weeks

Sample Size

20 patients were taken for the study.

Duration of Intervention

The Participants will undergo 8 weeks of High- Intensity Interval Training (HIIT) program which will involve Treadmill workouts, consisting of 30 minutes session, alternate days of the week.

Variable**Independent Variable**

Treadmill

Dependent Variable

- Quality of life
- Physical and mental health

Assessment Tool

- Polycystic Ovarian Syndrome Questionnaire- (PCOS-Q)
- Short- Form Health Survey- (SF-36)

Procedure**Patient preparation**

Women with PCOS, aged 18-28, who are sedentary or lightly active will be recruited. Participants must provide medical clearance from their physician and meet specific inclusion and exclusion criteria. Instruct the subject to dress comfortably and wear appropriate shoes. Advise the subject to avoid eating a heavy meal for two hours before the test. A 'warm-up' for about 5-10 minutes should be performed.

Pre-Test

Pre-Test was taken by using PCOS-Symptom Questionnaire (PCOS-Q), Short Form Health Survey (SF-36).

Procedure

Direct the subject to the equipment. Introduction to treadmill and HIIT protocol will consist of 5–10-minute warm-up session. This session will last for 30 minutes. Start with shorter intervals and gradually increase durations. Gradually increase the speed. Heart rate should be maintained within 125 bpm to 145 bpm throughout the exercise sessions. During the test verbal cues can be used to encourage the patient to pick up their speed. Gradually reduce the speed. The session concludes with 10 minutes of cool-down stretching exercises. The HIIT should end immediately if the participant experiences severe chest pain or discomfort, extreme dizziness or lightheadedness, severe shortness of breath.

Post- Test

Immediately record the scores of Polycystic ovary syndrome questionnaire (PCOS-Q), Short Form Health Survey (SF-36).

Results

The study evaluated quality of life, physical, and mental health in women with Polycystic Ovary Syndrome (PCOS). Statistical analysis showed a mean difference of 42.55 (SD = 10.24) for PCOS symptoms and 47.10 (SD = 51.6) for quality of life, indicating notable improvements post-intervention. Paired t-test results revealed significant changes, with t-values of 7.31 for PCOS symptoms and 7.62 for quality of life ($p < 0.05$). These findings confirm that the intervention had a meaningful impact, demonstrating improvements in both physical and emotional health outcomes for women with PCOS.

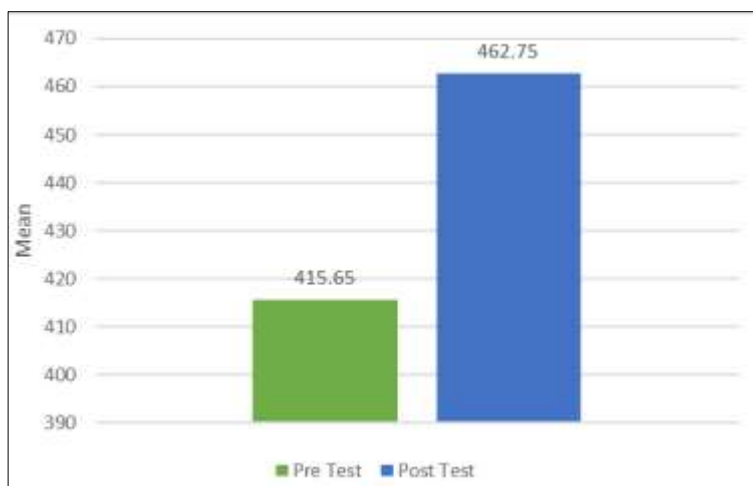


Fig 1: Comparison of mean values of pain between pre and post-test (SF-36)

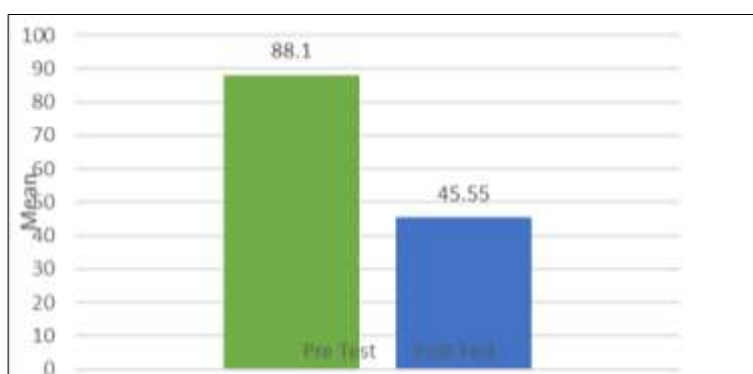


Fig 2: Comparison of mean values of functional mobility between pre and post-test (PCOS-Q)

Discussion

Polycystic Ovary Syndrome (PCOS) is a chronic endocrine disorder affecting reproductive, metabolic, and psychological health, with depression and anxiety contributing significantly to reduced quality of life. In this study, High-Intensity Interval Training (HIIT) was evaluated as a therapeutic intervention using the PCOS-Q and SF-36 scales in 20 women with PCOS. The results demonstrated significant reductions in PCOS symptoms and improvements in quality of life, though with notable inter-individual variability. These findings highlight the potential of HIIT to enhance both physical and mental health, while also emphasizing the importance of individualized exercise prescriptions, as responses may vary depending on baseline fitness, symptom severity, and mental health status. Future research should explore the long-term effects of HIIT and its role within comprehensive, multidisciplinary management strategies for PCOS. The evaluation of both PCOS symptoms and quality of life during the HIIT sessions provided valuable insights into the physical and mental health of women with PCOS. Notably, the variability of these parameters highlights the necessity for repeated assessments to accurately track the disease's progression and the individual responses to interventions.

Conclusion

The result of the study concluded that the pre-test and post-test, the value of PCOS symptoms reduced on (PCOS-Q) and Physical and mental health is been improved during High Intensity Interval Training (HIIT) on women with PCOS.

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