ejpmr, 2025, 12(9), 207-211

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

SJIF Impact Factor 7.065

Research Article

ISSN (O): 2394-3211

ISSN (P): 3051-2573

A COMPARATIVE STUDY OF HIIT IN COMBINATION WITH CBT ON ANXIETY AND DEPRESSION AMONG PCOS WOMEN

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Article Received on 08/07/2025 **Article Revised on 28/07/2025** **Article Accepted on 18/08/2025**

ABSTRACT

Polycystic Ovary Syndrome is an endocrine disorder that commonly affects women of reproductive age. The condition can lead to various physical challenges, such as irregular menstrual cycles, fertility problems, and body image concerns, along with other long-term health complications. These symptoms often contribute to increased psychological distress, which can significantly impact a person's overall well-being and quality of life. The aim of the study is to improve depression and anxiety among PCOS women by using High Intensity Interval Training and Cognitive Behavioural Therapy. The study was an experimental study which included a total of 30 samples within age group 18-30 years. They were divided randomly divided into two groups of 15 subjects in each group where Group A were given High Intensity Interval Training along with Cognitive Behavioural Therapy while Group B were given only Cognitive Behavioural Therapy. The result of the study prove that each group shows p value (p=<0.001). However, Group A (HIIT and CBT) shows more significant improvement than Group B (CBT). This study concluded that GROUP A (HIIT AND CBT) and GROUP B (CBT) is effective in reducing depression and anxiety among PCOS women but more significant improvements had been observed in GROUP A which included both HIIT and CBT.

KEYWORDS: Polycystic Ovarian Syndrome, Depression, Anxiety, Polycystic Ovarian Syndrome Quality Of Life, High Intensity Interval Training, Cognitive Behavioural Therapy.

INTRODUCTION

The mental well-being of women plays a crucial role in the overall health of society.[1] PCOS (polycystic ovarian syndrome) is an endocrine-metabolic disease which usually affects women of reproductive age.[2] It is characterised by, polycystic ovary, oligomenorrhea, and amenorrhea, high androgen levels can result in hirsutism and acne, thus resulting upon negative emotions.[3] It is accompanied by a wide range of symptoms related to endocrine and reproductive disorders.[4]

The prevalence of PCOS ranges from 4% to 21% globally and in India the prevalence varies from 2% to 35%; also 70% of affected women remain undiagnosed worldwide.[5] It might be due to certain genetic factor, trauma, environmental factors as such social status, lifestyle and eating habits. It is defined as a metabolic disorder accompanied by an elevated risk of developing insulin resistance, hypertension, obesity and also metabolic changes.[6] Also, high androgen levels could lead to hirsutism and acne.[7] Thus, this population is more likely to experience negative feelings associated to anxiety and depression.[8] Due to certain imbalances particularly hormonal imbalance and insulin resistance among PCOS have been linked to exacerbation of the pre-existing psychiatric conditions which in turn leads to various mood disorders.[9] The interconnection between the neurotransmitter abnormalities and hormonal changes may give chip in towards emotional deregulation and affecting the overall psychological well being.[10]

PCOS is also diagnosed with Rotterdam criteria.[11] In this condition the ovaries tend to be enlarged comprising of multiple cysts. In addition to it irregular menstruation, infertility, weight gain, excessive hair growth, isolation, body dissatisfaction, low self-esteem.[12, 13] A sum total of all these bodily changes could exacerbate psychological trauma with emotions of self-consciousness, body shaming, humiliation, low self worth.[14] Research shows that the women with PCOS experiences enhanced levels of depression and anxiety as compared to that of the normal female population.[15] The amount of emotional distress they feel might be associated to multiple factors. Thus, emotional distress hugely affects their quality of

life. Also, negative societal judgements could have a negative impact on social interactions which can then lead to psychological trauma.[16]

Depression is among the one issue frequently assessed by psychologists, psychiatrists and behavioural scientists worldwide.[17] The prevalence rate of depression among PCOS women tends to be around 37%.[18] PCOS is linked to inflammation and prolonged inflammation is linked with a high cortisol level which in turn increases the risk of depression.[19]

On the other hand, anxiety is among the other common condition. An elevated level and long-term anxiety are usually associated with certain physiological responses such as an increased cardiovascular function, metabolism, and reduced immunity. The prevalence rate of anxiety among PCOS women tends to be around 42%.[20]

Based on PCOS management exercise is among one therapy which has given numerous benefits.[22] High Intensity Interval Training (HIIT) is a fitness program that involves short bouts of high intensity exercises with periods of rest or light exercises.[23] It has shown positive results over time with marked clinical conditions. As compared to that of lower regime exercises a more optimistic metabolic health have been reported for HIIT. Thus, HIIT has beneficial effects on reproductive factor, metabolic factor, body composition and psychological factor. It focuses on the intensity, duration, and frequency. Thus, each HIIT training has its own characteristics adaptations and results.[24-27]

Cognitive-behavioural therapy has been one of the most significant advancements in treating mental health disorders over the past 50 years. This therapy encourages individuals to monitor their own behaviour, set realistic and achievable goals, develop new coping strategies to manage or prevent relapses of symptoms, and adopt healthier behaviours in emotional or psychological crises, particularly in women with PCOS.[28] Cognitive-behavioural therapy (CBT) has been shown to be effective for a variety of conditions, including psychotic disorders, depression, anxiety, personality disorders, aggression, pain-related discomfort, chronic fatigue, pregnancy issues, eating disorders and hormonal imbalances in women.[29] The American Psychological Association and the American College of Physicians recommend CBT as the primary treatment for depression.[30]

CBT and HIIT intervention among PCOS women aim to emphasize non-pharmacological treatment approaches that focusing on maintaining an active and healthy lifestyle comprising of regular exercise regime and positive thinking.[31] The aim of the study is to improve depression and anxiety among PCOS women by using HIIT and CBT.

MATERIALS AND METHOD

This study comprised of a sample size of 30 women who voluntarily signed the informed consent form and were also fulfilled inclusion criteria include Female of age 18-30 Years, Diagnosed with PCOS under Rotterdam criteria and medical records and exclusion criteria include Bleeding disorder, Pregnant women, Musculoskeletal injuries that could be aggravated by exercise protocol, Type 1 or type 2 Diabetes, Uncontrolled hypertension and Post partum women. The samples were divided into two groups where Group A(N =15) received combined treatment of HIIT along with CBT and Group B (N=15) received CBT as treatment. The treatment for both the groups were given for a total of 4 weeks per week 3 alternate sessions of about 45 minutes for each group. The samples were analysed for the pre and post values of PCOSQOL, DASS and were statistically analysed.

Group A: CBT: All the participants were given a counselling session that was done based on their comfort. The therapy sessions comprised of mood screening, introducing cognitive behaviour patterns, challenging thoughts, following up and evaluation. They were advised to stay in touch through. The contents of the sessions comprised of:

- **Counselling based on CBT approach**
- **Psychodynamic group therapy**
- **Meetings with a lifestyle coach**

Cognitive Behavioural Therapy (CBT) is a powerful tool that can greatly benefit life coaches in helping their clients achieve personal growth and transformation. By integrating CBT techniques into their coaching practice, life coaches can assist clients in overcoming negative thoughts, emotions, and behaviours that may be hindering their progress.

- **CBT embedded in a group-based lifestyle programme**

Integrating Cognitive Behavioural Therapy (CBT) into a group-based lifestyle program can be effective for promoting positive behavioural and lifestyle changes, addressing various issues like depression, anxiety, and obesity, by fostering a supportive environment and teaching skills for long-term maintenance.

HIIT: All the participants were priorly educated about the intensity of exercise and recovery period. They were instructed not to indulge in any other physical training during the study period. They were advised to stay in touch. It started with:

- **Warm up**
- **Low intensity run**
- **Sprint running:**
- **Dynamic stretching:**

Group B

All the participants were provided a counselling session that was done based on their comfort. The therapy

sessions comprised of mood screening, introducing cognitive behaviour patterns, challenging thoughts, following up and evaluation. They were advised to stay in touch. The contents of the sessions comprised of:

- **Counselling based on CBT approach**
- **Psychodynamic group therapy**
- **Meetings with a lifestyle coach**
- **Mindfulness stress management**

DATA ANALYSIS

The collected data were tabulated and analysed using both descriptive and inferential statistics. All the parameters were assessed using statistical package for social science (SPSS) version 26.0. Paired t-test was adopted to find the statistical difference within the groups & Independent t-test was adopted to find the statistical difference between the groups.

Table 1: Showing Comparison Of Dass Questionnaire Score Between Group – A And Group – B In Pre Test And Post Test.

DASS		DASS		DASS		DASS	DASS
		MEAN	SD	MEAN	SD		
DEPRESSION	DEPRESSION	DEPRESSION	DEPRESSION	DEPRESSION	6.75	0.480	.635*
	POST TEST	7.53	1.68	13.13	4.83	4.233	.000**
ANXIETY	ANXIETY	ANXIETY	ANXIETY	ANXIETY	6.45	0.255	.801*
	POST TEST	6.46	1.59	9.80	3.38	3.449	.000**
STRESS	STRESS	STRESS	STRESS	STRESS	4.46	0.149	.882*
	POST TEST	12.33	1.71	16.60	3.04	4.729	.000**

Table 2: Showing Comparison of Pcosqol Scale Score Between Group – A and Group – B In Pre Test And Post Test.

PCOSQOL	GROUP A		GROUP B		t-TEST	SIGNIFICANCE
	MEAN	SD	MEAN	SD		
PRE TEST	**147.00**	**29.40**	**151.40**	**39.11**	**0.348**	**.730***
POST TEST	**225.47**	**9.40**	**158.53**	**38.84**	**6.486**	**.000****

RESULTS

In Table 1, On comparing mean values of GROUP-A and GROUP-B on DASS Questionnaire scores shows highly significant improvement in the post-test mean but GROUP-A shows (D-7.53, A-6.46, S-12.33) lesser mean value is more effective than GROUP-B (D-13.13, A-9.80, S-16.60) at P≤0.001, Hence the null hypothesis is rejected.

In Table 2, On comparing mean values of GROUP-A and GROUP-B on PCOS Quality of Life Questionnaire score shows highly significant improvement in the post-test mean but GROUP-A shows (225.47) higher mean value is more effective than GROUP-B (158.53) at P≤0.001, Hence the null hypothesis is rejected.

DISCUSSION

Women with PCOS are more likely to have a higher prevalence rate of anxiety and depression disorders as that of ones without PCOS. The current study examined two distinct interventions HIIT and CBT on psychological factors in PCOS affected women. The results showed that overtime the PCOSQOL and DASS scores significantly improved. Existing research reports suggests that HIIT has shown much alleviated improvements in aerobic capacity, insulin sensitivity, menstrual regulation and hormonal profiles. It ensures an efficacious and time effective intervention for both physical and psychological outcomes. Also, it is observed that the physical symptoms caused by the condition could lead to psychological disorders and this population is about three times more prone to psychological disorders and reduced quality of life. Results showed that CBT was quite effective in reducing the anxiety and depressive symptoms while also promoting a good quality of life with PCOS women.

As HIIT involves short bursts of intense exercise followed by rest periods which provides reduction in insulin resistance as HIIT enhances insulin sensitivity by increasing glucose uptake in muscles and improving insulin signalling that helps regulate blood sugar and reduce systemic inflammation both of which are linked to mental health issues, exercise reduces circulating testosterone and other androgens which can alleviate symptoms like acne, hair growth, and mood instability, stimulates the release of endorphins and other mood-enhancing neurotransmitters, such as dopamine and serotonin which are often low in individuals with anxiety and depression, regulate cortisol levels which prevents mood disorders, promotes brain function. On the other hand, cognitive behavioural therapy is a psychological intervention that focuses on changing negative thought patterns and behaviours associated with anxiety and depression which helps in Regulation of the Hypothalamic Pituitary Adrenal (HPA) Axis, modulation of brain neurotransmitters, reduction in systemic inflammation. Thus, the combination of HIIT and CBT offers a powerful, physiologically driven approach upon managing anxiety and depression in women with PCOS. While HIIT targets metabolic and neurochemical imbalances, CBT addresses cognitive distortions and stress-related inflammation. Together, they create a

comprehensive mind-body treatment that can improve both physical and mental well-being in PCOS patients.

The result of the study prove that each group shows p value (p=<0.001). However, Group A (HIIT and CBT) shows more significant improvement than Group B (CBT).

Sheida Majidzadeh et al (2023) : The CBT approach can help women with PCOS manage depression and anxiety while enhancing their overall quality of life. This is achieved through various methods, including cognitive assessment techniques, recognizing and addressing negative thought patterns, and developing effective coping strategies.

Rhiannon K. Patten et al (2023) : After HIIT the anxiety and depression scores improved and reduced the stress scores also exercise done at an individuals preferred intensity showed greater outcomes in mental health outcomes and attrition rates.

The limitations of the study comprised of a short study duration in which other gender was not included. The selected age groups were from 18-30 years of age. Also, the samples of the study were limited to a particular geographic area.

The recommendations of the study were that it can be performed for a larger number of samples and also a varied age groups could be taken into consideration. The duration of the study could be extended to much longer in order to see the long-term effectiveness.

CONCLUSION

This study concludes that GROUP A (HIIT AND CBT) and GROUP B (CBT) is effective in reducing depression and anxiety among PCOS women but more significant improvements had been observed in GROUP A which included both HIIT and CBT.

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