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Psychological and Physical Health Profile in Women with Polycystic Ovary Syndrome (PCOS): A Comparative Analysis of Anxiety, Depression, Body Image, and Self-Esteem

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Abstract. *Polycystic Ovary Syndrome (PCOS) is a multifaceted endocrine disorder affecting women of reproductive age, often leading to a range of physical and psychological symptoms. This study aimed to explore the psychological dimensions of PCOS, focusing on anxiety, depression, body shape preoccupation, and self-esteem among women diagnosed with the syndrome, compared to a control group of healthy women. A cross-sectional observational study was conducted at a tertiary care hospital, involving 126 participants—63 women with PCOS and 63 controls. Using standardized scales, including the Hamilton Anxiety and Depression Rating Scales, the Rosenberg Self-Esteem Scale, and the Body Shape Questionnaire, significant differences were observed between groups. Women with PCOS reported higher levels of anxiety, depression, and body shape preoccupation, as well as lower self-esteem compared to controls. Correlation analysis further revealed a significant positive relationship between body shape concerns and both anxiety and depression, as well as a negative relationship between body shape preoccupation and self-esteem. These findings emphasize the necessity for comprehensive treatment approaches that integrate mental health support alongside medical management for PCOS. Addressing both physical and psychological needs may enhance overall well-being and improve the quality of life for women affected by PCOS.*

Keywords. *Polycystic Ovary Syndrome, PCOS, anxiety, depression, body image, self-esteem, mental health, women's health, endocrine disorder, holistic treatment*

I. Introduction

Polycystic Ovary Syndrome (PCOS) is a complex and multifaceted endocrine disorder that affects a significant portion of the global female population, particularly women of reproductive age. Characterized by symptoms like hyperandrogenism, menstrual irregularities, and metabolic disturbances, PCOS can significantly impact physical health. Common physical manifestations include acne, obesity, excessive hair growth, and, in some cases, infertility. These physical challenges often mask a deeper, more complex layer of mental health implications, including heightened levels of anxiety, depression, low self-esteem, and body image issues. This dual burden of physical and psychological symptoms not only affects the quality of life for women with PCOS but also highlights the need for comprehensive healthcare approaches that address both physical and mental health dimensions.

The primary physiological markers of PCOS include irregular ovulation, polycystic ovaries, and elevated levels of androgens, which lead to various symptoms that may differ in intensity among individuals. Research suggests that around 5-10% of women of reproductive age experience PCOS, though this percentage may be higher due to underdiagnosis and varying diagnostic criteria worldwide [1]. PCOS is also closely linked to insulin resistance, increasing the risk of type 2 diabetes, cardiovascular disease, and other metabolic complications.

This clustering of health issues contributes to the label of PCOS as a "syndrome," a constellation of symptoms rather than a single disease, which can make diagnosis and treatment challenging.

The physical symptoms of PCOS, especially those related to appearance and body weight, contribute to a significant psychological impact. Women with PCOS often face societal pressures related to body image, compounded by symptoms such as hirsutism, acne, and weight gain, all of which can contribute to feelings of self-consciousness and dissatisfaction with appearance [2]. The relationship between physical symptoms and psychological wellbeing in PCOS is complex; physical symptoms can cause or worsen mental health conditions, while mental health issues can lead to behaviors, like emotional eating or social withdrawal, that may exacerbate physical symptoms. For instance, weight gain associated with insulin resistance can lead to a cycle where physical inactivity and poor diet worsen both the physical and psychological outcomes of PCOS.

The scope of psychological impact extends beyond body image. Studies indicate that women with PCOS are more likely to experience anxiety and depression than those without the condition. Research highlights that the prevalence of depression in women with PCOS can reach up to 50%, while anxiety affects nearly 40% of individuals with the syndrome. Anxiety may manifest in various forms, from generalized unease to panic attacks, and is often accompanied by physical symptoms like fatigue and difficulty concentrating. Depression in PCOS patients can range from mild to severe, often contributing to low motivation, decreased interest in social or recreational activities, and a diminished sense of self-worth [3]. This connection between PCOS and mental health issues is thought to stem from multiple factors, including hormonal imbalances, body image concerns, and chronic stress associated with managing a long-term condition.

Hormonal imbalances are a key factor in the psychological symptoms observed in women with PCOS. Elevated androgen levels, common in PCOS, have been linked to mood disorders, while insulin resistance and hyperinsulinemia are associated with inflammation and oxidative stress, both of which have been implicated in mental health issues. Additionally, fluctuations in estrogen and progesterone levels, which regulate mood and stress response, can lead to increased vulnerability to anxiety and depression [4]. This interplay of hormones and neurotransmitters suggests a biological pathway that partially explains the high prevalence of mental health concerns in women with PCOS. However, the exact mechanisms remain under investigation, and more research is needed to fully understand how these hormonal disturbances contribute to psychological outcomes.

The significance of studying psychological parameters in women with PCOS cannot be overstated. Although PCOS is widely recognized as a medical condition with physical symptoms, its psychological effects often receive less attention, both in clinical practice and research [5]. The traditional focus on managing symptoms like menstrual irregularities, acne, and weight has left a gap in addressing the mental health needs of PCOS patients. Without adequate support and intervention for anxiety, depression, and other psychological symptoms, the overall health and quality of life of women with PCOS may remain compromised. Integrating mental health support into the treatment plan for PCOS patients can not only improve psychological outcomes but also positively affect physical health by encouraging healthier lifestyles and promoting better adherence to medical advice.

In recent years, there has been a growing recognition of the need for a holistic approach to managing PCOS. A comprehensive treatment plan should ideally address both the physical and psychological aspects of the syndrome. For instance, lifestyle modifications, such as diet and exercise, can help reduce symptoms like insulin resistance and obesity while also improving mood and reducing stress. Cognitive-behavioral therapy (CBT) and mindfulness-based interventions have shown promise in reducing anxiety and depression among women with PCOS. Addressing these psychological aspects can also create a positive feedback loop, as reduced stress and improved self-esteem can lead to healthier behaviors and better physical outcomes [6].

Furthermore, understanding the psychological burden of PCOS is essential for developing effective patient-centered care. Healthcare providers should be trained to recognize the signs of anxiety, depression, and other mental health issues in PCOS patients, allowing for timely intervention and support. Regular mental health screening could become a standard part of PCOS management, enabling providers to tailor treatment plans that address the full spectrum of patient needs. This holistic approach could improve patient satisfaction, adherence to treatment, and overall health outcomes.

In conclusion, PCOS is not just a reproductive or metabolic disorder but a syndrome with significant psychological implications. The interplay between physical and mental health in PCOS underscores the importance of an integrated approach to treatment that includes psychological support. By addressing both the physical and psychological aspects of PCOS, healthcare providers can help women with this condition achieve a better quality of life and reduce the long-term health risks associated with both the physical and mental aspects of the syndrome. Future research should continue to explore the biological, psychological, and social factors contributing to the mental health outcomes in women with PCOS, paving the way for more comprehensive and effective treatments.

II. Literature Review

Polycystic Ovary Syndrome (PCOS) is a widely recognized endocrine disorder that affects a significant number of women globally, particularly during their reproductive years. Characterized by hormonal imbalances, metabolic disruptions, and psychological impacts, PCOS has been extensively studied for its multifaceted presentation [7]. This literature review will cover the historical evolution of PCOS understanding and characterization, highlight recent research on its psychological and physiological effects, and examine existing studies on mental health concerns such as anxiety, depression, body image, and self-esteem among women with PCOS.

The term "Polycystic Ovary Syndrome" was first coined in the early 20th century by Drs. Irving Stein and Michael Leventhal, who documented a cluster of symptoms—absent or irregular menstruation, hirsutism, and enlarged ovaries containing multiple cysts—in a small sample of women. Their 1935 study introduced the association between polycystic ovaries and endocrine disruptions, establishing a foundation for PCOS as a disorder rooted in hormonal imbalance and reproductive dysfunction. Stein and Leventhal's research was pioneering, as it highlighted both reproductive and androgenic abnormalities, proposing a link to pituitary gland activity and subsequent hormonal regulation issues [8].

Following Stein and Leventhal's work, advancements in endocrine research led to the identification of hyperandrogenism and anovulation as defining features of PCOS. By the late 20th century, diagnostic criteria expanded with the development of the Rotterdam Criteria in 2003. These guidelines established that a PCOS diagnosis required two of the following three criteria: hyperandrogenism (either clinical or biochemical), chronic anovulation, and polycystic ovarian morphology observed through ultrasound [9]. The Rotterdam Criteria remain one of the most widely accepted diagnostic frameworks for PCOS, although there is ongoing debate within the medical community about the potential for overdiagnosis and the lack of emphasis on metabolic dysfunction.

Since then, further developments in diagnostic criteria have emerged, including those from the National Institutes of Health (NIH) and the Androgen Excess Society, emphasizing various aspects of the syndrome [10]. These diagnostic frameworks reflect an evolving understanding of PCOS as a syndrome that encompasses not only reproductive health but also metabolic and psychological dimensions. Increasing evidence now suggests that insulin resistance, obesity, and cardiovascular risks are integral components of the syndrome, alongside

reproductive dysfunction. Researchers today view PCOS as a systemic condition with diverse presentations and impacts, leading to a holistic approach in diagnosis and treatment.

Recent research has brought to light the complex interaction between the physiological and psychological dimensions of PCOS. Physiologically, PCOS is marked by a range of symptoms stemming from hyperandrogenism, insulin resistance, and reproductive disruptions. Hyperandrogenism, or elevated androgen levels, leads to symptoms like hirsutism, acne, and hair loss, which can cause significant distress among patients. Insulin resistance, often coupled with obesity, increases the risk of developing type 2 diabetes and cardiovascular diseases. Together, these physiological aspects contribute to a state of chronic inflammation and metabolic imbalance, which can exacerbate both physical and mental health issues in women with PCOS [11].

From a psychological perspective, recent studies reveal that women with PCOS experience a higher prevalence of mental health disorders, including anxiety, depression, and body image concerns, compared to women without the syndrome. For instance, a systematic review and meta-analysis found that women with PCOS had nearly double the odds of experiencing depression and anxiety [12]. These findings have spurred interest in exploring how hormonal imbalances, particularly elevated androgen and cortisol levels, might contribute to mood disorders. Chronic inflammation and insulin resistance are also implicated in mental health outcomes, as they have been linked to increased stress responses and neuroendocrine disruptions.

Another area of interest is the impact of lifestyle factors and physical activity on mental health in PCOS. Studies indicate that regular exercise and a balanced diet can alleviate some symptoms of PCOS, particularly insulin resistance and weight gain, which can improve both physical and mental health outcomes. Research also suggests that physical activity positively affects mental health, reducing levels of depression and anxiety in women with PCOS. However, despite the benefits, women with PCOS often face significant barriers to engaging in physical activity due to weight gain, fatigue, and psychological stress, which perpetuates a cycle of poor mental and physical health.

The psychological effects of PCOS are gaining increasing attention in research due to their impact on patients' quality of life. Anxiety and depression are particularly common among women with PCOS, with studies reporting prevalence rates of 40-50% for these disorders. Anxiety in women with PCOS can be triggered by several factors, including concerns about physical appearance, fear of infertility, and the stress of managing a chronic illness. Some studies suggest that the elevated androgen levels associated with PCOS may contribute to anxiety through neuroendocrine mechanisms, as androgens have been linked to the regulation of stress and mood.

Depression, another prevalent condition among women with PCOS, is often compounded by feelings of helplessness, social isolation, and body dissatisfaction. The experience of managing a condition with visible symptoms such as weight gain, acne, and hirsutism can contribute to a poor self-image and reduced self-worth. Research indicates that depressive symptoms in women with PCOS may stem from both hormonal factors—such as elevated cortisol levels and altered serotonin pathways—and environmental influences, such as societal beauty standards and stigmatization.

Body image issues are also prominent in the psychological profile of PCOS patients. Women with PCOS frequently report dissatisfaction with their appearance, largely due to weight gain and hirsutism. A meta-analysis examining body image concerns in PCOS found that women with the syndrome scored significantly lower on body satisfaction measures compared to women without PCOS. Body dissatisfaction often coexists with other psychological symptoms, reinforcing negative self-perceptions and contributing to a lowered quality of life. The dissatisfaction with body image can further contribute to anxiety and depression, creating a cycle that perpetuates psychological distress in these individuals.

Self-esteem is another critical aspect of mental health affected by PCOS. Women with PCOS often experience reduced self-esteem, which can be attributed to a combination of physical symptoms, societal pressures, and internalized stigma. Research has shown that self-esteem in women with PCOS is inversely related to symptoms of hirsutism, acne, and obesity, with higher symptom severity correlating with lower self-esteem scores. A study conducted in India found that over 70% of women with PCOS felt unattractive due to symptoms like facial hair and acne, while nearly 60% reported avoiding social interactions as a result. The psychological distress associated with low self-esteem can impact various areas of life, from relationships and career aspirations to overall well-being.

In summary, the existing literature highlights that PCOS is not only a physical health concern but also a significant psychological challenge. Anxiety, depression, body image dissatisfaction, and low self-esteem are common among women with PCOS and are often interconnected. Research indicates that these psychological symptoms can be exacerbated by both physiological factors, such as hormonal imbalances and inflammation, and social factors, including stigma and societal beauty standards. The psychological dimensions of PCOS underscore the importance of a holistic approach to managing the condition, where both physical and mental health are given equal attention to improve patients' quality of life. As research on PCOS continues to evolve, addressing the mental health needs of women with the syndrome remains essential for achieving comprehensive care and better health outcomes.

III. Methodology

This section outlines the study design, participant selection criteria, data collection tools and measures, and statistical analysis techniques employed to investigate the psychological and physical health parameters in women with Polycystic Ovary Syndrome (PCOS). The research methodology aims to provide a comprehensive framework for understanding how PCOS influences anxiety, depression, body image, and self-esteem, comparing women with PCOS to healthy controls.

A. Study Design and Setting

This research adopts a prospective cross-sectional observational design to examine the association between PCOS and various psychological parameters. A cross-sectional approach was chosen to assess both physical and psychological health markers simultaneously, allowing for direct comparisons between participants with PCOS and a matched control group. Given that PCOS is a chronic condition with persistent symptoms, the cross-sectional design enables researchers to capture the impact of long-term physical and psychological challenges associated with the syndrome.

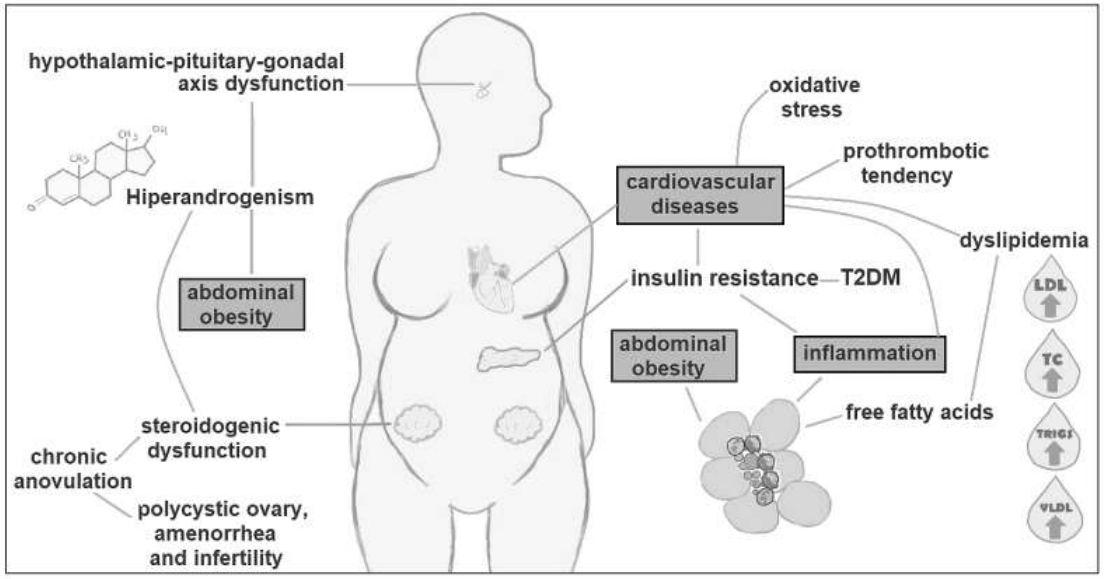

Figure 1: High risk factors for PCOS[20]

The study was conducted at Krishna Hospital, a tertiary care hospital in Karad, India, between June 2022 and November 2023. This setting provided access to a large population of women with PCOS, enabling the recruitment of participants with diverse sociodemographic backgrounds. The hospital's gynecology and endocrinology departments assisted in the identification of eligible participants, ensuring that all women included in the study had a confirmed diagnosis of PCOS based on standardized diagnostic criteria. The control group comprised healthy women without PCOS who visited the hospital for routine check-ups or minor ailments unrelated to hormonal or reproductive health issues. The hospital setting facilitated access to diagnostic tools and healthcare professionals, which was essential for confirming the health status of participants and obtaining reliable data.

B. Participant Selection Criteria (Inclusion and Exclusion)

The study included women diagnosed with PCOS as the case group and healthy women as the control group, with a total of 126 participants (63 cases and 63 controls). Participants were selected based on specific inclusion and exclusion criteria to ensure a representative and homogenous sample.

a. Inclusion Criteria:

1. **Age**: Participants were limited to women of reproductive age (18–35 years), as PCOS primarily affects this demographic.
2. **Education Level**: Participants had to be educated to at least the 10th-grade level to ensure they could understand and respond accurately to the questionnaires used for data collection.
3. **PCOS Diagnosis**: Women in the case group were required to have a confirmed diagnosis of PCOS based on the Rotterdam criteria, which necessitate the presence of at least two out of three symptoms: hyperandrogenism, ovulatory dysfunction, or polycystic ovarian morphology.
4. **Confirmation of PCOS Symptoms**: Clinical and ultrasound examinations were used to verify PCOS symptoms, confirming that participants met the necessary diagnostic criteria.

5. **Willingness to Participate**: All participants provided informed consent before participating in the study, ensuring they were willing to answer questions related to sensitive topics such as mental health, body image, and self-esteem.

b. Exclusion Criteria:

1. **Comorbid Medical and Psychiatric Conditions**: Participants with known medical or psychiatric conditions unrelated to PCOS (e.g., cardiovascular disease, major depressive disorder, or generalized anxiety disorder) were excluded to minimize confounding factors.
2. **Physical Disabilities**: Women with physical disabilities that could affect their ability to engage in daily activities were excluded to maintain a homogenous sample in terms of physical health.
3. **Hormonal Treatment**: Participants currently receiving treatment with hormonal therapies (e.g., oral contraceptives or hormone replacement therapy) were excluded, as these medications can impact both physical and mental health parameters.
4. **Pregnancy**: Pregnant women were excluded, as pregnancy can alter hormone levels and affect psychological well-being, potentially confounding the study's outcomes.
5. **Substance Abuse**: Participants with a history of substance abuse (alcohol, drugs) were excluded, as this could influence mental health and hormonal balance, complicating data interpretation.

By applying these criteria, the study ensured a well-defined sample that allowed for meaningful comparisons between women with and without PCOS.

C. Data Collection Tools and Measures

To assess the psychological and physical health parameters in participants, standardized questionnaires and clinical measurements were used. The questionnaires selected for this study have been widely validated in the fields of psychology and health, allowing for reliable assessment of anxiety, depression, body image, and self-esteem.

1. **Sociodemographic Questionnaire**: This questionnaire collected information on participants' age, marital status, residence, education level, occupation, and monthly family income. These variables were controlled in the analysis to account for potential sociodemographic influences on psychological parameters.
2. **Hamilton Anxiety Rating Scale (HAM-A)**: The HAM-A, developed by Max Hamilton in 1959, was used to assess the level of anxiety in participants. This scale includes 14 items that evaluate symptoms of anxiety, including both physical and psychological symptoms. Scores range from 0 to 56, with higher scores indicating greater levels of anxiety. This tool has been validated for use in clinical and research settings and is suitable for identifying anxiety symptoms among both clinical and non-clinical populations.
3. **Hamilton Depression Rating Scale (HAM-D)**: The HAM-D, also created by Max Hamilton in 1960, was used to evaluate depressive symptoms in participants. The scale contains 21 items that assess mood, guilt, sleep, and other areas affected by depression. Scores range from 0 to 52, with higher scores indicating more severe depression. Like the HAM-A, this scale is a validated and reliable measure frequently used in studies of mental health.
4. **Rosenberg Self-Esteem Scale (RSES)**: Developed by Dr. Morris Rosenberg in 1965, the RSES assesses participants' self-esteem through a series of 10 statements regarding self-worth and self-competence. The scale has a scoring range of 0 to 30, with higher scores indicating higher self-esteem. The RSES is widely used in studies involving self-perception and has been validated across diverse populations, making it suitable for this study's objectives.
5. **Body Shape Questionnaire (BSQ)**: The BSQ, developed by Cooper and Fairburn, measures participants' preoccupation with body shape and concerns about appearance. This 34-item questionnaire asks

participants to rate their experiences related to body dissatisfaction, with higher scores indicating greater preoccupation with body shape. This tool has been validated in populations with body image concerns and is particularly relevant for assessing body image issues in women with PCOS.

6. **Physical Measurements**: Clinical measurements were also taken, including body mass index (BMI), to provide additional insights into participants' physical health. Height and weight were recorded for each participant, allowing for BMI calculation. BMI data was important for assessing the relationship between physical health and psychological well-being, particularly in understanding whether body image concerns correlated with actual weight.

Data collection was conducted through face-to-face interviews in a private setting within the hospital to ensure confidentiality and comfort for the participants. Each participant was administered the sociodemographic questionnaire and psychological assessment tools by trained researchers. All questionnaires were completed independently by the participants, with the researcher available for clarification if needed.

D. Statistical Analysis Techniques Used

The data collected was analyzed using IBM SPSS Statistics (version 19) software. Statistical analysis methods included descriptive statistics, inferential statistics, and correlation analyses to address the study's objectives.

1. **Descriptive Statistics**: Basic descriptive statistics, including means, standard deviations, frequencies, and percentages, were calculated to summarize the demographic data and the scores on each psychological scale (HAM-A, HAM-D, RSES, and BSQ). Descriptive statistics provided an overview of the sample characteristics and the distribution of anxiety, depression, body image concerns, and self-esteem among participants.
2. **Independent Samples t-Tests**: To assess differences in psychological parameters between the PCOS group and the control group, independent samples t-tests were conducted. This analysis tested whether there were statistically significant differences in the mean scores of anxiety, depression, self-esteem, and body image between the two groups. A p-value of <0.05 was considered significant.
3. **Pearson's Correlation Coefficient**: Pearson's correlation tests were used to explore relationships between the psychological variables (anxiety, depression, self-esteem, body image) and physical health indicators (BMI). This analysis provided insights into how body image preoccupation correlated with factors like anxiety, depression, and self-esteem within the PCOS group.
4. **Analysis of Variance (ANOVA)**: ANOVA was used to examine differences in psychological variables among participants based on BMI categories (normal vs. high BMI). This test allowed for an assessment of whether BMI significantly influenced anxiety, depression, or body image concerns among participants, particularly in the PCOS group.
5. **Multivariate Analysis**: To control for potential confounding variables (such as age, income, and education level), multivariate analyses were conducted. This enabled a more refined understanding of the relationships between psychological and physical health parameters in women with PCOS, accounting for demographic variables that may affect outcomes.

In summary, the methodological approach of this study was carefully designed to explore the physical and psychological dimensions of PCOS. By employing validated tools and robust statistical analyses, this research aims to contribute to the growing body of knowledge on PCOS, highlighting the need for a comprehensive approach to patient care that includes psychological support alongside physical health management.

IV. Results

a. Demographic Characteristics of Participants

Table 1: Demographic Characteristics of Participants

Characteristic	PCOS Group	Control Group
Age (mean ± SD)	22.37 ± 2.43	22.09 ± 2.09
Weight (mean ± SD)	63.57 ± 11.24	61.05 ± 10.65
Height (mean ± SD)	159.77 ± 5.31	159.89 ± 5.4
Marital Status (%)	Unmarried 90.5, Married 9.5	Unmarried 90.5, Married 9.5
Residence (%)	Rural 92.1, Semi-urban 6.3, Urban 1.6	Rural 92.1, Semi-urban 6.3, Urban 1.6
Education (%)	Graduate/Honors 89.7, High School 10.3	Graduate/Honors 89.7, High School 10.3

The table 1. summarizes the demographic characteristics for both the PCOS group and the control group. Key characteristics like age, weight, height, marital status, residence, and education are displayed, showing no significant demographic differences between groups.

b. Comparative Data on Psychological Measures

Table 2: Comparative Data on Psychological Measures

Measure	PCOS Group (mean ± SD)	Control Group (mean ± SD)
Anxiety	15.06 ± 9.79	7.63 ± 5.73
Depression	9.38 ± 5.47	5.79 ± 3.50
Self-Esteem	18.70 ± 5.58	21.92 ± 5.05
Body Shape Preoccupation	81.52 ± 31.21	59.43 ± 22.65

The table 2, shows comparative data on anxiety, depression, body shape preoccupation, and self-esteem. The PCOS group had significantly higher mean scores for anxiety and depression, as well as body shape preoccupation, compared to the control group. Conversely, self-esteem scores were lower in the PCOS group, highlighting a psychological impact associated with PCOS.

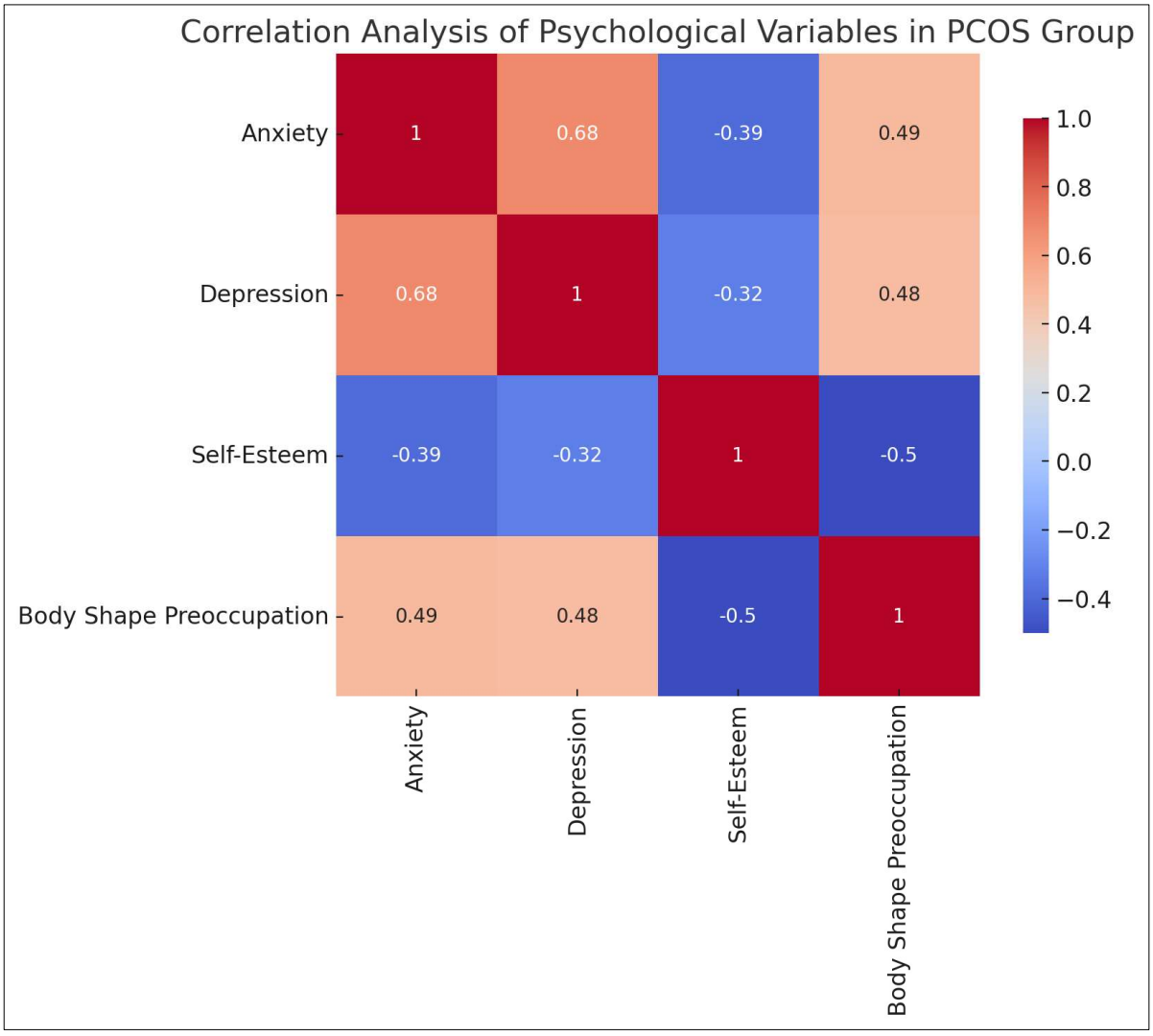

Figure 2. Correlation Analysis between Body Shape, Self-Esteem, Anxiety, and Depression

The heatmap above illustrates the correlation between these psychological variables for the PCOS group. Notable correlations include:

- Positive correlation between anxiety and depression, indicating that individuals with higher anxiety are likely to experience greater levels of depression.
- Negative correlation between self-esteem and body shape preoccupation, showing that increased preoccupation with body shape is associated with lower self-esteem.
- Positive correlation between body shape preoccupation and both anxiety and depression, suggesting that concerns about body shape are linked to higher levels of these mental health issues.

V. Discussion

The findings from this study highlight the substantial physical and psychological impact of Polycystic Ovary Syndrome (PCOS) on women, particularly regarding anxiety, depression, self-esteem, and body image. The data reveal significant psychological distress among women with PCOS compared to healthy controls, underscoring the importance of considering both the physical and mental health aspects of the syndrome. This section interprets these results in light of existing literature, explores the potential mechanisms driving these psychological outcomes, and discusses the broader implications for healthcare interventions in PCOS management.

A. Psychological Distress in PCOS: Anxiety and Depression

Women with PCOS exhibited significantly higher levels of anxiety and depression than the control group. This aligns with prior research indicating a strong association between PCOS and mood disorders. Several studies have shown that anxiety and depression rates in women with PCOS are nearly double those in women without the syndrome. The heightened prevalence of anxiety and depression could be attributed to a combination of hormonal, metabolic, and psychosocial factors. For instance, elevated androgen levels in women with PCOS may impact mood regulation, as androgens are linked to neurotransmitters involved in stress and emotional response. Additionally, insulin resistance, which is common in PCOS, has been associated with inflammatory processes that may exacerbate mood disorders.

From a psychosocial perspective, women with PCOS face unique stressors, such as concerns about fertility, physical appearance (due to symptoms like hirsutism and weight gain), and chronic illness management. The ongoing stress of these challenges can lead to or worsen anxiety and depressive symptoms, creating a cycle that may impact both mental and physical health. For example, increased levels of anxiety and depression might lead to lifestyle changes like poor dietary habits and physical inactivity, which can further aggravate PCOS symptoms. These findings emphasize the need for healthcare providers to address mental health concerns as part of the overall treatment plan for women with PCOS, as psychological well-being may directly influence the effectiveness of physical health interventions.

B. Body Shape Preoccupation and Self-Esteem

This study also found that women with PCOS had a significantly higher preoccupation with body shape and lower self-esteem compared to healthy controls. Body image issues are frequently reported in PCOS and are often driven by physical symptoms like weight gain, hirsutism, and acne. Such symptoms may be intensified by societal beauty standards, making women with PCOS more susceptible to body dissatisfaction. This dissatisfaction with body image can lead to lower self-esteem, as seen in the present study.

The correlation analysis in this study revealed a negative relationship between body shape preoccupation and self-esteem. This indicates that as concerns about body image increase, self-esteem tends to decrease. The positive correlation between body shape concerns and both anxiety and depression further highlights the interconnected nature of these psychological challenges. Women who are preoccupied with their body shape may experience greater anxiety and depressive symptoms, possibly due to a perception of reduced social acceptance or attractiveness.

The interplay between body image dissatisfaction and mental health issues in PCOS suggests that body image interventions could play a crucial role in improving the psychological outcomes for women with this condition. Cognitive-behavioral therapy (CBT) techniques focused on body acceptance and self-compassion have shown

promise in addressing body dissatisfaction and enhancing self-esteem. Integrating such approaches into PCOS management may help mitigate body-related stressors and support mental health.

C. The Role of BMI and Physical Health in Psychological Outcomes

Interestingly, while the PCOS group reported higher levels of anxiety, depression, and body shape preoccupation, correlation analyses indicated that BMI was not a statistically significant independent factor in determining levels of anxiety and depression within the PCOS group. This suggests that psychological distress in women with PCOS may be influenced more by neuroendocrine and metabolic factors than by body weight alone. Although body weight and BMI can contribute to body image concerns, this study suggests that mental health outcomes are more closely linked to the hormonal and metabolic disturbances associated with PCOS rather than weight alone.

This finding supports the hypothesis that underlying neuroendocrine mechanisms, such as fluctuations in cortisol, androgens, and insulin, may have a direct impact on mood regulation in women with PCOS. Insulin resistance, for example, has been linked to inflammation and oxidative stress, both of which are associated with anxiety and depression. Thus, targeting insulin resistance and metabolic health in treatment may benefit mental health, emphasizing the need for a holistic, multi-faceted approach in managing PCOS.

D. Implications for Treatment and Future Research

The current findings underscore the necessity for comprehensive treatment approaches that address both the physical and mental health aspects of PCOS. Traditional PCOS management often focuses on physical symptoms like menstrual irregularities and insulin resistance, with less attention given to mental health support. However, this study highlights the critical need for mental health interventions, as the psychological burden associated with PCOS can significantly affect quality of life and adherence to medical recommendations.

VI. Conclusion

This study underscores the profound impact of Polycystic Ovary Syndrome (PCOS) on both physical and psychological health. Women with PCOS were found to have significantly higher levels of anxiety and depression, as well as increased body shape preoccupation and lower self-esteem compared to healthy controls. These psychological issues are closely intertwined with the physical symptoms of PCOS, such as weight gain, acne, and hirsutism, highlighting the need for a holistic approach to managing the syndrome. The findings suggest that PCOS should be understood not only as a reproductive and metabolic disorder but also as a condition with substantial psychological dimensions. The elevated anxiety and depression levels observed in women with PCOS may stem from a complex combination of hormonal imbalances, metabolic disturbances, and social stressors. Additionally, the strong association between body image concerns and mental health symptoms further emphasizes the role of body dissatisfaction in shaping the psychological experience of PCOS. Given these results, healthcare providers should incorporate mental health screening and support into standard PCOS care. Interventions such as cognitive-behavioral therapy, body image therapy, and lifestyle modifications focusing on both physical and mental health could improve outcomes for women with PCOS. Future research should continue to explore the pathways linking hormonal, metabolic, and psychological factors in PCOS and evaluate the effectiveness of integrated treatment approaches. In conclusion, addressing both the physical and psychological needs of women with PCOS is essential for comprehensive care. By acknowledging the full scope of PCOS's impact, healthcare providers can help improve the quality of life, mental health, and overall well-being of those affected by this complex and multifaceted syndrome.

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