

# A Comparative Study of Psychological Burden and Sexual Dysfunction in Patients with Polycystic Ovarian Syndrome and Healthy Controls, and Its Correlation with Sexual Hormones

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## *Abstract-*

**Background:** Polycystic ovarian syndrome (PCOS) affects 5-10% of reproductive-age women worldwide, with a prevalence of 35% in India. PCOS is characterized by symptoms like obesity, hirsutism, acne, and infertility. These symptoms contribute to psychological distress, including stress, anxiety, and depression, among women with PCOS.

**Methods:** Recent studies have shown high rates of anxiety and depression in women with PCOS, with depression prevalence ranging from 23% to 64% globally. Anxiety disorders affect 11.5% to 38.6% of PCOS individuals. PCOS diagnosis is based on hyperandrogenism, ovulatory dysfunction, and polycystic ovaries. However, depression and anxiety often remain undetected, resulting in inadequate treatment.

**Results:** Women with PCOS experience higher rates of depressive episodes, social phobia, eating disorders, and suicide attempts. They also use more antidepressants and anxiolytic drugs. Sexual dysfunction is prevalent in PCOS, attributed to symptoms like obesity and hirsutism. Lower education levels and hirsutism contribute to higher sexual dysfunction rates. Increased BMI is associated with reduced sexual desire and satisfaction. PCOS women report diminished sexual attractiveness and desire. Stress, anxiety, depression negatively affect sexual function. Testosterone levels may not strongly correlate with female sexual function or well-being due to measurement challenges.

**Conclusion:** Comprehensive research is needed to understand the psychological burden and sexual dysfunction in PCOS patients, as well as their correlation with hormone levels. PCOS affects women's mental health, with depression and anxiety often overlooked. Sexual dysfunction, influenced by physiological and psychosocial factors, is also common. Advancing our knowledge in these areas will improve diagnosis and treatment, enhancing the overall quality of life for PCOS patients. Healthcare professionals should address psychological and sexual aspects and raise awareness for effective management.

**Key words:** Polycystic ovarian syndrome (PCOS), endocrine disorder, prevalence.

## INTRODUCTION

Polycystic ovarian syndrome (PCOS) is a common endocrine disorder affecting 5-10% of women in their reproductive age worldwide. In India, the reported prevalence of PCOS is as high as 35% among women. PCOS is characterized by various clinical symptoms such as obesity, hirsutism, acne, and infertility.<sup>1</sup> In India, the prevalence of PCOS has been observed to vary among different racial groups, with an estimated prevalence of 9.13% in adolescents. These symptoms have been found to impact the mental health of women with PCOS, leading to significant psychological distress. The psychological burden associated with PCOS can be categorized into stress, anxiety, and depression for ease of measurement.<sup>2</sup>

Stress is a circumstance that disturbs or has the potential to disturb the normal physiological or psychological functioning of an individual. The concept of stress and its relation to disease was first studied by Walter Cannon in the 1920s. He demonstrated that stress triggers the "fight or flight" response, characterized by physiological changes in the body. Hans Selye further developed the concept of stress, considering it as a non-specific bodily response to any demand, whether pleasant or unpleasant. Anxiety, on the other hand, is the feeling of apprehension caused by the anticipation of danger, while depression is characterized by feelings of sadness, loneliness, despair, and low self-esteem.<sup>3</sup>

Recent studies have highlighted the association between PCOS and increased rates of anxiety and depression. The prevalence of depression in women with PCOS ranges from 23% to 64% in studies conducted worldwide, with similar rates observed in studies conducted in India.<sup>4</sup> Anxiety disorders in PCOS have been estimated to range from 11.5% to 38.6%. PCOS is diagnosed based on the presence of two out of three criteria: hyperandrogenism, ovulatory dysfunction, and polycystic ovaries. The most common clinical presentations of PCOS include hyperandrogenism signs and symptoms, accompanied by irregular menstrual cycles or infertility. However, depression and anxiety in women with PCOS often go unnoticed, resulting in under-recognition and under-treatment of these conditions.<sup>5</sup>

Women with PCOS have a higher lifetime incidence of depressive episodes, social phobia, eating disorders, and suicide attempts. They also exhibit higher usage of antidepressants and anxiolytic drugs compared to the general population. Sexual dysfunction in women with PCOS has been less studied but can be attributed to the symptoms associated with PCOS, such as obesity, hirsutism,

and psychosocial maladjustments. Sexual dysfunction refers to problems during any phase of the sexual response cycle that prevent individuals or couples from experiencing satisfaction from sexual activity.<sup>6</sup> Physiological factors, psychological factors, or a combination of both can contribute to sexual dysfunction. Studies have indicated a high prevalence of sexual dysfunction among PCOS patients, particularly among those with lower education levels and hirsutism. Increased body mass index (BMI) levels have also been associated with decreased sexual desire and satisfaction. PCOS women have reported experiencing reduced sexual attractiveness and desire compared to their counterparts.<sup>7</sup> Furthermore, a negative correlation has been observed between stress, anxiety, depression, and sexual function. One study found significant negative correlations between the sexual function scores of PCOS patients and their levels of total and free testosterone. However, testosterone levels may not strongly correlate with female sexual function or overall well-being, especially considering the challenges in accurately measuring free and total testosterone within the lower range in females.<sup>8,9</sup>

While various studies have individually explored the effects of PCOS on psychological and sexual aspects, there is a need for comprehensive research examining the psychological burden and sexual dysfunction in PCOS patients compared to healthy individuals, while also investigating their correlation with luteinizing hormone (LH), follicle-stimulating hormone (FSH), and testosterone levels.<sup>10</sup>

In conclusion, PCOS is a prevalent endocrine disorder that affects a significant number of women in their reproductive age. It is characterized by various clinical symptoms and has a profound impact on mental health, leading to stress, anxiety, and depression.<sup>11</sup> However, depression and anxiety in women with PCOS are often overlooked and under-treated. Sexual dysfunction is also a common issue among PCOS patients, which can be attributed to both physiological and psychosocial factors.<sup>12</sup>

Research on PCOS has primarily focused on improving treatment options and pregnancy outcomes. However, there is a growing need to understand the psychosocial aspects and sexual function associated with PCOS. By conducting a comparative study between PCOS patients and healthy controls, we can gain valuable insights into the psychological burden and sexual dysfunction experienced by PCOS patients.<sup>13</sup> Additionally, exploring the correlation between these factors and hormonal imbalances, such as LH, FSH, and testosterone levels, can provide a more comprehensive understanding of the complex relationship between PCOS, mental well-being, and sexual function.<sup>14</sup>

Enhancing our knowledge in these areas will contribute to improved diagnostic and therapeutic approaches for PCOS patients, ultimately leading to enhanced overall quality of life.<sup>15</sup> By addressing the psychological and sexual aspects of PCOS, healthcare professionals can provide comprehensive care and support to women with this condition. It is imperative to raise awareness about PCOS and its impact on mental health and sexual well-being, ensuring that these aspects are appropriately addressed in the management of PCOS patients.<sup>16</sup>

## **MATERIAL AND METHODS:**

**TYPE OF STUDY:** Comparative study.

**STUDY DESIGN:** Cross-sectional, hospital-based study.

**STUDY PLACE:** Department of Psychiatry, SMS Medical College and Associated Group of Hospitals, Jaipur.

**DURATION OF STUDY:** After receiving Ethical Committee approval on December 2021 onwards for a period of 1 year or till desired sample size was reached.

**STUDY UNIVERSE:** Out Patient Department of Department of Obstetrics and Gynecology, SMS Medical College and Associated group of Hospitals, Jaipur.

**STUDY GROUP:** Participants were divided into two groups; one group consisted of patients diagnosed with polycystic ovarian syndrome and control group consisted of women without polycystic ovarian syndrome.

### **STUDY TOOLS:**

- 1) Consent forms (Hindi/English).
- 2). Screening proforma for recruitment of study participants in accordance with selection criteria.
- 3) Sociodemographic proforma including sociodemographic details and clinical profile of participants.
- 4) Lab investigations: LH : 1.1-25 mIU/ml.

**FSH:** 1.5-11.8 mIU/ml.

**Testosterone:** <1ng/ml.

### **SAMPLE SIZE:**

Sampling technique: Simple random and convenience sampling method was used for collecting data. According to the seed article, sample size was calculated to be 220 with 110 females of age group 18-45 years, each in 2 groups as case group and control group, at study power of 80% and at 95% CI with alpha error of 0.5 expecting moderate anxiety as one of psychological burden among pts of PCOS and pts without PCOS as 40% and 22.2% .

### **SELECTION CRITERIA:**

#### **INCLUSION CRITERIA:**

- (1) Patients diagnosed with PCOS as per Rotterdam criteria 2003 (at least 2 of the 3 of following), with help from Gynecologists.
  - Oligo-ovulation and/or an-ovulation
  - Hyper androgenic state
  - Polycystic ovaries
- (2) Adult female patients in the reproductive age group (18-45 years)
- (3) Patients willing to give informed consent and those willing to answer sensitive questions about female sexual dysfunction.

**EXCLUSION CRITERIA:**

1. Patients on psychotropics.
2. Patients having a concurrent, significant medical illness or with specific neoplasms and surgical illness.
3. Pregnant women.

**METHODOLOGY:**

The study was initiated after receiving acceptance from the Research Review Board and Ethical Committee. Informed written consent was obtained from the patients and informants before their participation in the study, either in Hindi or English. The subjects were selected from patients and attendants visiting the Gynecology OPD based on the selection criteria. The test group consisted of patients diagnosed with PCOS, while the control group included individuals without PCOS. The convenience sampling method was used to select PCOS cases, and simple random sampling method was employed to recruit controls. The socio-demographic and clinical profiles of the participants were comprehensively assessed. Due to the sensitivity of certain aspects of the study for most Indian women, each woman was first asked to evaluate herself using a scale, followed by a direct face-to-face interview with the doctor or medical staff to ensure a correct understanding of the questions. Lab investigations were conducted, and data were collected from the participants.

**RESULTS****Table 1: Distribution of study subjects according to age of menarche(years)**

Menarche (years)	Cases		Controls		Total	
	N	%	N	%	N	%
<15 years	71	64.5	62	56.4	133	60.5
>15 years	39	35.5	48	43.6	87	39.5
<b>Total</b>	110	100	110	100	220	100

Chi-square = 1.217 with 1 degree of freedom; P = 0.270

Most of the PCOS cases had menarche <15 years (64.5%), while 35.5% cases had menarche >15 years. Most of the controls had menarche <15 years (56.4%), while 43.6% cases had menarche >15 years of age. This difference in age of menarche among PCOS cases and controls was not found to be statistically significant (p=0.270).

**Table 2: Comparison of DASS 21 anxiety score among study groups**

Group	N	Mean ± SD
Cases	110	9.73 ± 3.53
Controls	110	9.16 ± 3.58

t test = 1.177 with 218 degree of freedom; p = 0.241

The mean anxiety score was higher among PCOS cases was (9.73 ± 3.53), as compared to controls (9.16 ± 3.58), this difference in mean anxiety score among the study groups was however not found to be statistically significant (p=0.241).

**Table 3: Comparison of DASS 21 depression score among study groups**

Group	N	Mean ± SD
Cases	110	8.93 ± 2.45
Controls	110	8.53 ± 2.34

t test = 1.238 with 218 degree of freedom; p = 0.217

The mean depression score was higher among PCOS cases was (8.93 ± 2.45), as compared to controls (8.53 ± 2.34), this difference in mean depression score among the study groups was however not found to be statistically significant (p=0.217).

**Table 4: Comparison of study groups according to testosterone**

Group	N	Mean ± SD
Cases	110	0.40 ± 0.22
Controls	110	0.27 ± 0.09

t test = 5.757 with 218 degree of freedom; p < 0.001 (S)

The mean testosterone level was higher among PCOS cases (0.40 ± 0.22) nanogram per ml, as compared to controls (0.27 ± 0.09), this difference in mean testosterone level among the study groups was found to be statistically significant (p<0.001).

**DISCUSSION:**

Consistent with numerous previous studies, our research findings provide further evidence of a higher occurrence of anxiety, depression, stress, and sexual dysfunction among women diagnosed with polycystic ovary syndrome (PCOS) when compared to those without the condition. Interestingly, we observed a weak positive correlation between levels of luteinizing hormone (LH) and anxiety symptoms, as well as elevated mean levels of testosterone in women with PCOS.<sup>17</sup> However, our study did not find any significant correlation between hormone levels, specifically serum testosterone, and psychological distress, which is consistent with similar studies conducted in the past.

The prevalence of anxiety and depression in our study aligns with the reports from previous research. It is worth noting that women with PCOS often exhibit increased activity in the hypothalamic-pituitary-adrenal axis and heightened heart rate reactivity to stress, which may contribute to their vulnerability to experiencing anxiety.<sup>18</sup> These findings are in line with a case-control study conducted in Saudi Arabian females, which indicated that a substantial proportion of PCOS patients experience emotional distress, including depression, anxiety, and stress.<sup>19</sup>

Our study also supports prior research by demonstrating that women with PCOS tend to experience greater psychological disturbances compared to control groups. Specifically, women with PCOS displayed higher levels of anxiety, depression, aggression, and lower life satisfaction.<sup>20</sup> Additionally, they reported lower satisfaction with their sexual lives. Similarly, we found lower scores in various domains of sexual function, including arousal, lubrication, orgasm, satisfaction, and overall sexual function, when compared to healthy controls. However, it is important to acknowledge that some studies have found no significant association between PCOS, hormonal profiles, and sexual dysfunction.<sup>21</sup>

We observed a higher prevalence of sexual dysfunction in women with PCOS compared to the control group, particularly in the domains of pleasure/satisfaction, desire/interest, arousal/excitement, and orgasm/completion. Nevertheless, the association between serum testosterone levels and sexual functioning did not reach statistical significance. Our findings align with other studies that have reported no substantial difference in total sexual function scores between women with and without PCOS.<sup>22</sup>

In conclusion, our study provides further support for the increased prevalence of anxiety, depression, stress, and sexual dysfunction among women with PCOS compared to those without the condition. While we observed a weak positive correlation between LH levels and anxiety symptoms, and higher mean levels of testosterone in PCOS women, we did not find a significant correlation between hormone levels, particularly serum testosterone, and psychological distress.<sup>23</sup> The findings highlight the complex relationship between PCOS, psychological well-being, and hormonal profiles, emphasizing the need for comprehensive research to better understand and address the unique challenges faced by women with PCOS.<sup>24</sup>

## CONCLUSION:

According to this study's findings, sexual dysfunction and psychological discomfort are more common in women with PCOS than in women without the condition, and these problems are unrelated to the level of sexual hormones. Because PCOS impacts every aspect of health, it is necessary to treat PCOS patients using an interdisciplinary strategy that includes the skills of obstetrics-gynecology, endocrinology, and psychiatry, with a strong focus on counselling and support groups.

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