



## MENTAL HEALTH IMPLICATION OF POLYCYSTIC OVARY SYNDROME (PCOS); A CROSS-SECTIONAL STUDY

Fatima<sup>1</sup>, Izaz Jamal<sup>2</sup>, Muhammad Muslim Khan<sup>3\*</sup>, Ejaz Gul<sup>4</sup>, Hemasa Gul<sup>5</sup>, Sabir Zaman<sup>6</sup>

<sup>1</sup>Assistant Professor Gynecology, Bacha Khan Medical College/Mardan Medical Complex, Mardan, Pakistan

<sup>2</sup>Assistant Professor Psychiatry Bacha Khan Medical College /Mardan Medical Complex Mardan, Pakistan

<sup>3\*</sup>Associate Professor Psychiatry, Bacha Khan Medical College/Mardan Medical Complex, Mardan, Pakistan

<sup>4</sup>Professor of Psychiatry, Bacha Khan Medical College/Mardan Medical Complex, Mardan, Pakistan

<sup>5</sup>Assistant Professor Gynecology, Bacha Khan Medical College /Mardan Medical Complex. Pakistan

<sup>6</sup>Senior Lecturer Psychology. Department of Psychology, Islamic International University, Islamabad, Pakistan

\*Corresponding Author: Muhammad Muslim Khan

\*Email: muslimkhan3067@gmail.com

### ABSTRACT

**Background:** Polycystic ovary syndrome (PCOS) is a hormonal disorder in women that occurs in women of childbearing age and it is estimated that 6-10% of women in the global population suffer from this disease. While many individuals are aware that PCOS has physical symptoms, including delayed or absent periods and excessive hair growth, as well as struggles with conception, the mental effects are not a topic of frequent conversation.

**Objective:** The objective of this study is to examine the psychological consequences of PCOS in particular on Anxiety, depression, and quality of life of the affected women.

**Study Design:** A Cross-Sectional Study.

**Duration and Place of the Study:** Department of Psychiatry & GYNAE & OBS Mardan Medical Complex (MMC) Mardan, between the period of 10th Jan 2020 to 10th July 2021.

**Methods:** This study involved 105 women with PCOS. Participants were assessed using standardized questionnaires: The BDI is used to assess depression, GAD-7 for anxiety, and WHOQOL-BREF for quality of life.

**Results:** In this study, the participants are 105 female patients. A high level of depressive symptoms was identified, with 58% of the students being classified as moderate to severe, according to the BDI. Participants also reported high levels of anxiety, with 65% of the participants having a GAD-7 scale score suggestive of moderate to severe anxiety. The overall self-perceived health status declined significantly, although the change was more profound in the QOL dimensions perceived by the patients, especially in psychological aspects and social contacts.

**Conclusion:** The findings of the current study point to the fact that women with PCOS exhibit high levels of mental health issues. This high prevalence of anxiety and depression in such patients should perhaps explain why an integrated PCOS care delivery model that responds to both body and mind is relevant.

**Keywords:** Polycystic ovary syndrome, Mental Health, Women's Health.

## INTRODUCTION

Polycystic Ovary Syndrome (PCOS) is defined as an endocrine dysfunction prevalent among women of childbearing age group in developed countries with a prevalence of 6- 10% [1]. (PCOS) is a disorder that, in addition to the inability to conceive, encompasses a range of symptoms like irregular periods, excess androgen levels, hirsutism, acne, and alopecia due to enlarged ovaries; yet, they also have a link with other metabolic diseases such as insulin resistance, obesity, type 2 diabetes, and cardiovascular diseases [2]. PCOS has been known to have many physical symptoms and treatment intervention for these symptoms is common but comparatively less is known concerning the impact of this disease on the well-being of the clients [3, 4]. Some recent research reveals that women with PCOS are more likely to suffer from depression, anxiety, and impairments in quality of life [5]. The stigma associated with PCOS due to its chronicity, visibility, and effects on the reproductive system can lead to substantial psychological stress [6]. Mental health is a crucial factor in the lives of individuals, and the needs of chronically ill patients can be solved by focusing on the mental and physical aspects of the patient [7, 8]. Nevertheless, there is a lack of literature regarding the mental health of women with PCOS and the pathways between PCOS and those psychological states are not well understood. It is imperative, therefore, to comprehend these connections to create comprehensive management strategies that will tackle the PCOS physical symptoms as well as the psychological issues that accompany the condition. To address this gap, this thesis seeks to identify and explore the mental health consequences of PCOS in a group of women with the disorder. The current study objective is to establish the current level of mental dysfunction concerning depressive and anxious disturbances in women with PCOS. Furthermore, the research finds an established association between the intensity and frequency of PCOS symptoms and mental health status to extend the knowledge of the relationship between physical and mental health among women with this condition. This study will therefore establish the need for screening and intervention for mental health in women with PCOS and will also educate the healthcare givers on the need for holistic healthcare delivery systems. In conclusion, this research seeks to improve women's living with PCOS by demanding that healthcare providers and institutions pay more attention to these patients.

## METHODOLOGY

**Duration and Place of the Study:** This research was carried out at the Department of Psychiatry, Mardan Medical Complex (MMC), Mardan over one year starting from 10-Jan 2020, up to 10- July 2021.

### Methods

The study included 105 women aged 18-45 years who were diagnosed with PCOS based on the Rotterdam criteria, which require at least two of the following three criteria: diagnosed previously by anovulation, clinical and biochemical signs of hyperandrogenism, and polycystic ovary morphology detected by transvaginal US. Exclusion criteria were pregnancy and any other endocrine dysfunction, such as thyroid disorders, hyperprolactinemia, and psychiatric disorders that have been diagnosed before PCOS. Participants and their clinicians provided data through clinical interviews, self-report questionnaires, and chart reviews. Demographic characteristics and clinical parameters involved in the study were age, BMI, menstrual history, and the intensity of PCOS symptoms. This 21-item self-administered scale was used to assess the degree of depressive pathological functioning. The scores, which are obtained from the questionnaire, can vary between 0 and 63 where the higher scores are indicative of the increased probability of severe depression symptoms in the patient. The screening tool that was self-administered included seven questions designed to assess the severity of the manifestations of anxiety. It is a self-administered questionnaire that is made of 21 questions and its total score is obtained by totaling the scores of each of the 21 questions, and the score range is 0 to 21, with a higher score indicating a higher level of anxiety. This Cross-sectional survey consisted of 26 questions and was meant to measure four domains of QoL: physical health domain,

psychological health domain, social relationships, and physical environment domain. All the domains of quality of life have equal to 100 being the maximum value, meaning the higher the score, the better the quality of life.

### **Statistical Analysis**

All statistical analysis was conducted with the assistance of SPSS, version 25.0. Categorical data is shown as frequency and percentage, while continuous data is shown as mean and standard deviation. Specifically, the prevalence rates of depression and anxiety were determined by using the BDI and the GAD-7 scale scores, respectively. The scores obtained on the quality of life were also computed on the four subdomains of WHOQOL-BREF. Correlation tests were also employed to establish the links between the degree of PCOS symptoms and mental health. These relationships were analyzed using Pearson's correlation coefficients to see the magnitude and direction of the correlations. The multiple regression analysis was carried out with the view to control for confounding factors including age and BMI.

### **Ethical Considerations**

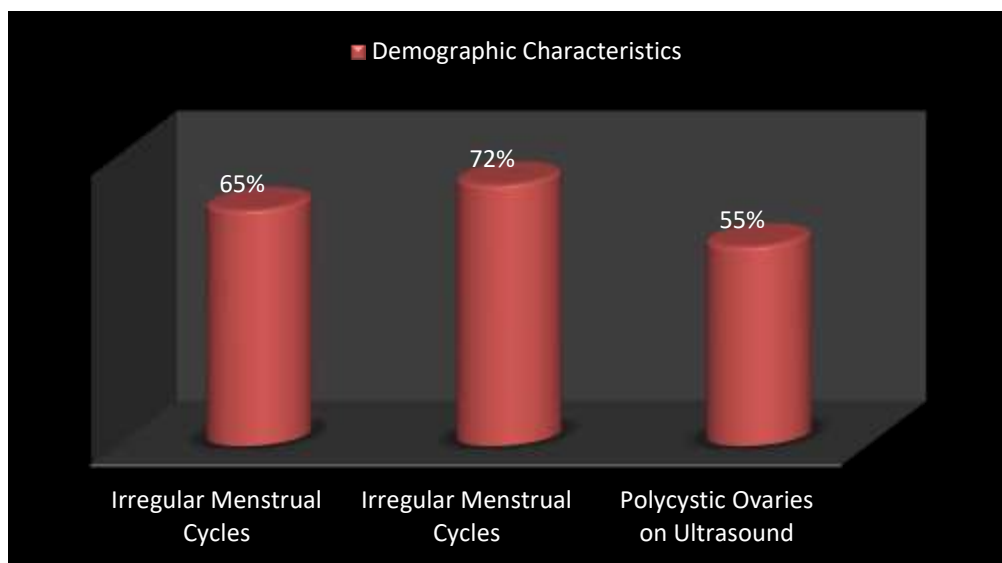
This research was carried out according to the Declaration of Helsinki and they had sought permission from the Mardan Medical Complex (MMC) ethical committee. The process of informed consent was followed so that participants agreed to be part of the study, and they were informed of the following: Their identity would be protected, and they could choose to withdraw from the study at any time without implications on their healthcare.

### **Results**

In this research, 105 women with PCOS. The mean age of the patients was  $28.4 \pm 5.6$  years and the mean BMI was  $29.7 \pm 6.7$  kg/m<sup>2</sup>. The irregularities of the menstrual cycle were observed in 65% of participants, 72% of them displayed clinical signs of hyperandrogenism, and 55% of the subjects had polycystic ovaries confirmed in the ultrasonic examination. In this study, 58% of the participants reported a moderate to severe level of depression based on BDI. In detail, 29% had moderate depression symptoms as marked by BDI scores of 20-28 while 29% had severe depression marked by BDI scores above 28. The GAD-7 assessment also revealed that 65% of the participants had moderate to severe anxiety based on the scale. Among the patients, 34% had a moderate level of anxiety with a GAD-7 score ranging between 10 and 14 while 31% had a severe level of anxiety with a GAD-7 score  $> 14$ . Thus, the mean score was  $52.4 \pm 15.8$ , which indicates that the participants reported to have significant physical health problems. The results indicated that the mean score was  $45.7 \pm 18.3$ , which could be attributed to a relatively high level of stress and, therefore, a negative impact on the mental health of the respondents. The overall mean score attained by the respondents was as follows: Secured mean ( $48.3 \pm 20.4$ ) indicating the probable reason that the child has problems with interpersonal relationships. The overall mean score was obtained and was also found to be  $55.6 \pm 17.1$  which means moderate difficulties in environmental barriers that restrict their quality of life. The Ferriman-Gallwey score (as the measure of hyperandrogenism) and the BDI scores were statistically significant and positive at 0.52,  $p < 0.001$ . The correlation between BMI and BDI was significant and moderate with a coefficient of 0.38,  $p < 0.01$ , as was the correlation between BMI and GAD-7 with a coefficient of 0.35,  $p < 0.01$ ; therefore, elevated BMI levels were associated with an increased level of depression and anxiety symptoms. Therefore, the results indicated that hirsutism severity ( $F = 76.06$ ,  $p < 0.001$ ) was a significant predictor of depressive symptoms ( $\beta = 0.45$ ,  $p < 0.001$ ). This study showed that menstrual irregularity was positively associated with anxiety symptoms (Standardized beta = 0.41,  $p < 0.001$ ) Depressive and anxiety symptoms were found to be significant predictors for the decreased QOL in the psychological domain, where, BDI scored ( $\beta = -0.42$ ,  $p < 0.001$ ) and GAD-7 scored ( $\beta = -0.39$ ,  $p < 0.001$ ).

According to the results of the current study, women with PCOS had higher levels of depression and anxiety and a lower quality of life than the normal range. It was also found that the extent of hirsutism and menstrual irregularity of PCOS symptoms was significantly correlated with worse mental health

status. These studies confirm the need for consideration of mental health problems in the treatment of PCOS and argue that interventions with an interdisciplinary focus are required to address the physical and psychological needs of women with this disorder.



**Figure 1: Demographic Characteristics**

**Table 1: Participants' clinical and**

Characteristic	Number of Patients (n=105)	Frequency (%)
Age (years), Mean ± (SD)	28.4 ± 5.6	-
BMI (kg/m <sup>2</sup> ), Mean ± (SD)	29.7 ± 6.4	-
Irregular Menstrual Cycles	68	(65%)
Clinical Hyperandrogenism	76	(72%)
Polycystic Ovaries on Ultrasound	58	(55%)

**Table 2: Prevalence of Depression and Anxiety**

Severity	BDI Score Range	Frequency (%)	GAD-7 Score Range	Frequency (%)
Minimal	0-13	22 (21%)	0-4	17 (16%)
Mild	14-19	22 (21%)	5-9	20 (19%)
Moderate	20-28	30 (29%)	10-14	36 (34%)
Severe	>28	31 (29%)	>14	32 (31%)

**Table 3: Quality of Life Scores by Domain (WHOQOL-BREF)**

Domain	Mean ± (SD)
Physical Health	52.4 ± 15.8
Psychological Health	45.7 ± 18.3
Social Relationships	48.3 ± 20.4
Environment	55.6 ± 17.1

**Table 4: Correlation Between PCOS Symptoms and Mental Health Outcomes**

PCOS Symptom	BDI (R)	p-value	GAD-7 (R)	p-value
Hirsutism Severity	0.52	<0.001	0.44	<0.001
Menstrual Irregularity	0.38	<0.01	0.47	<0.001
BMI	0.38	<0.01	0.35	<0.01

**Table 5:** Multiple Regression Analyses Predicting Mental Health Outcomes

Predictor Variable	Dependent Variable	$\beta$ Coefficient	p-value
Hirsutism Severity	BDI	0.45	<0.001
Menstrual Irregularity	GAD-7	0.41	<0.001
BDI	Psychological QoL	-0.42	<0.001
GAD-7	Psychological QoL	-0.39	<0.001

## Discussion

As a result, we demonstrated how prevalent anxiety and depression are, and how several aspects of quality of life are negatively impacted. According to the actual results, 65% of the individuals experienced moderate to severe anxiety and 58% of them had moderate to severe depression. These findings are supported by the study conducted by Bazarganipour et al., (2013) whereby they identified that 50%<sup>[9]</sup>. About the prevalence of depressive symptoms, the study showed that 9% of women with PCOS had such symptoms that were serious enough to be considered clinically significant according to the EDSS while 34. 2% had anxiety symptoms. Likewise, Cooney et al (2017) meta-analysis revealed that patients with PCOS were more likely to experience depression and anxiety than control participants with odds ratios of 4. 03<sup>[10]</sup>. The number of targets for breast cancer screening is 03 and it is 05 for depression. 62 for anxiety. Our findings support these studies by providing evidence of the significant magnitude of psychological stress experienced by females with PCOS. The findings of the present study however indicated the study population as having significantly lower scores on all aspects of the QOL, especially the mental health and social aspects. The average values for social relationships, environment, psychological health, and physical health were 52. 4, 45. 7, 48. 3, and 55. 6, according to this order. These findings are in line with Jones, et al. (2008), who noted that women with PCOS had a poorer quality of life compared to normal women in the aspects of emotion and interpersonal relationships. These two conditions are two of the most apparent and constant signs of PCOS: hirsutism and menstrual irregularity, which may have directly affected these results<sup>[11]</sup>. The study established relationships between the condition intensity of PCOS and mental health results. Hirsutism severity was further compared with BDI scores ( $r = 0. 52, p < 0. 001$ ) and GAD-7 scores ( $r = 0.44, p < 0. 001$ )<sup>15</sup>, showing that hirsutism severity is a positive predictor of depression and anxiety scores. This finding is in concordance with Benson et al. (2009) who also stated that there was a positive relationship between hyperandrogenism and psychological distress among women with PCOS<sup>[12]</sup>. The relationship between increased GAD-7 scores and menstrual irregularity was also noted to be statistically significant with a correlation coefficient of 0. 47, $p < 0. 001$ , this implies that irregular menstrual cycles are associated with increased anxiety. Deeks et al. (2011), for instance, have also observed that women with PCOS are frequently anxious and stressed by their menstrual cycles<sup>[13]</sup>. BMI also had a moderate positive correlation with both BDI ( $r = 0. 38, p < 0. 01$ ) and GAD-7 scores ( $r = 0. 35, p < 0. 01$ ), in that as BMI increases, depressive and anxiety symptoms also tend to be higher. This correlation between obesity and mental health in PCOS patients has been well-discussed with Moran et al. 2010, as an example pointing to the aggravating impact of obesity on the psychological health of the patients<sup>[14]</sup>. In the multiple regression analyses, it was found that the severity of the PCOS symptoms was influencing the mental health outcomes independently. The increase in hirsutism was positively associated with depressive symptoms ( $\beta = 0. 45, p < 0. 001$ ) while the irregularity in menstrual cycles was positively related to anxiety symptoms ( $\beta = 0. 41, p < 0. 001$ ). These findings imply that strategies should be employed to target and tame the individual symptoms of PCOS to reduce the psychological effects<sup>[15]</sup>. Moreover, depressive and anxiety symptoms also emerged as significant predictors of QOL in the psychological aspects, highlighting the importance of addressing mental health concerns in this context.

## Limitations

This study has limitations. The cross-sectional design approach is useful in making conclusions but not in establishing causality relationships. There are response biases inherent in self-report measures, and the sample was sufficient but not large enough to fully chart the range of PCOS symptoms. Further, as earlier mentioned, future longitudinal research with bigger and more heterogeneous samples should be conducted to better understand the causality between PCOS and mental health factors.

## Conclusion

To conclude, the current work focuses on the psychological morbidity of PCOS and the findings point toward increased depression and anxiety, as well as deteriorated quality of life. The results indicated that the severity of and symptoms related to PCOS are significantly associated with mental health outcomes and support the need for effective interventions that focus on both the physical and psychological aspects of the disorder. There is a need for healthcare providers to integrate mental health assessment and intervention for women with PCOS to address their well-being.

**Conflict of Interest:** Nill

**Funding Source:** Nill

## Authors Contribution

**Fatima:** Concept & Design of Study

**Sabir Zaman, Izaz Jamal:** Drafting

**Muhammad Muslim Khan, Ijaz Gul:** Data Analysis

**Hamasa Gul:** Critical review

**Muhammad Muslim Khan:** Final Approval of version

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