ORIGINAL RESEARCH

PCOS and Mental health: Investigating anxiety, depression and their associated risks

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ABSTRACT
Background: Diabetes mellitus (DM) is a chronic metabolic disorder characterized by persistent hyperglycemia. It may be due to impaired insulin secretion, resistance to peripheral actions of insulin, or both. According to the International Diabetes Federation (IDF), approximately 415 million adults between the ages of 20 to 79 years had diabetes mellitus in 2015. DM is proving to be a global public health burden as this number is expected to rise to another 200 million by 2040.**Aims & objectives:** The present study was conducted for evaluating the role of early screening for diabetic retinopathy in patients with diabetes mellitus.**Materials & methods:**A total of 200 patients were enrolled. Among them, 100 patients were of periodic screening while 100 patients were of non-periodic screening. Only diabetic patients were included. Many different modalities of screening were depending on the availability of local facilities. Scanning and ophthalmic examination of all the patients was done. Comparison was done. Statistical analysis was done. **Results:**Diabetic retinopathy on examination was seen in 10 percent of the patients of the periodic screening group and 23 percent of the patients of the non-periodic screening group. Diabetic retinopathy treatment was seen in 9 percent of the patients of the periodic screening group and 3 percent of the patients of the non-periodic screening group.**Conclusion:**India needs DR screening programs for early identification of the condition, supported by hierarchical referral structure to provide appropriate timely treatment to reduce the burden of blindness due to diabetes.
Key words: Diabetic retinopathy, Diabetes mellitus, screening

INTRODUCTION

Polycystic ovarian syndrome (PCOS) is a prevalent endocrine disorder affecting approximately 5-10% of reproductive-aged women globally[1]. It is characterized by hyperandrogenism, ovarian dysfunction, and polycystic ovaries[2]. Beyond its metabolic and reproductive implications, PCOS is increasingly recognized for its psychological impact, particularly in relation to depression and anxiety[3].Several studies have reported that women with PCOS are at a significantly higher risk of developing mental health disorders compared to the general female population[4].The chronic nature of PCOS symptoms, such as irregular menstruation, hirsutism, acne, obesity, and infertility, contributes to emotional distress, self-esteem issues, and a reduced quality of life[5].

Recent literature has highlighted the bidirectional relationship between PCOS and mental health disorders, suggesting that hormonal imbalances and metabolic dysfunctions may contribute to neuropsychiatric disturbances[6]. Despite growing awareness, there remains a gap in understanding the extent of these mental health issues among PCOS

patients, particularly in different demographic settings.

This study aims to determine the prevalence of depression and anxiety among women diagnosed with PCOS and explore associated risk factors. The findings could inform targeted interventions to improve the mental well-being of affected individuals.

METHODS
STUDY DESIGN AND PARTICIPANTS
This cross-sectional study was conducted at a tertiary care hospital between January and June 2024. A total of 130 women aged 18-40 years diagnosed with PCOS based on the Rotterdam criteria participated in the study. Exclusion criteria included individuals with pre-existing psychiatric disorders, chronic illnesses, or those on psychiatric medication.

SAMPLE SIZE ESTIMATION
The sample size was calculated using G power software:
Where:
- $Z = 1.96$ (standard normal variate for 95% confidence level).
- $p = 50\%$ (assumed prevalence of psychological

distress among PCOS patients based on previous studies).
- $d = 10\%$ (acceptable margin of error).

Using these values, the minimum required sample size was estimated to be 97 participants. To compensate for potential non-responses, the final sample size was increased to 130.

DATA COLLECTION
Participantscompleted a self-administered questionnaire covering demographic details, PCOS-related symptoms, lifestyle factors, and psychological distress. The Hospital Anxiety and Depression Scale (HADS) was used to assess anxiety and depression levels. A HADS score of ≥8 was considered indicative of clinical depression or anxiety.

STATISTICAL ANALYSIS
Data were analyzed using SPSS version 26.0. Descriptive statistics summarized demographic and clinical characteristics. Chi-square tests and logistic regression models were applied to determine associations between psychological distress and various factors.

Results
Table 1: Participant Characteristics

Characteristic	Frequency (n=130)	Percentage (%)
Age (Mean ± SD)	26.4 ± 5.2	-
BMI ≥ 30 kg/m²	68	52.3
Menstrual Irregularities	82	63.1
Sedentary Lifestyle	74	56.9
Infertility Concerns	48	36.9

The majority of participants were overweight or obese (52.3%), with a significant proportion experiencing menstrual irregularities (63.1%). More than half of the participants had a sedentary lifestyle (56.9%), and 36.9% reported concerns about infertility.

Table 2: Prevalence of Anxiety and Depression

Condition	Frequency (n=130)	Percentage (%)
Anxiety	72	55.4
Depression	62	47.7

More than half of the participants (55.4%) reported anxiety symptoms, while 47.7% exhibited depressive symptoms based on the HADS scale.

Table 3: Factors Associated with Anxiety and Depression

Factor	Anxiety (p-value)	Depression (p-value)
Obesity (BMI ≥30)	0.021	0.015
Infertility Concerns	0.008	0.034
Sedentary Lifestyle	0.032	0.027

Statistical analysis showed that obesity, infertility concerns, and a sedentary lifestyle were significantly associated with higher anxiety and depression levels.

DISCUSSION
The findings of this study demonstrate a high prevalence of anxiety (55.4%) and depression (47.7%) among women with PCOS. These results align with previous research indicating that PCOS patients are at a greater risk of psychological distress compared to the general population[3,4,6]. The high rates of depression and anxiety observed in this study highlight the significant impact of PCOS on mental

health and emphasize the need for psychological assessment as part of routine clinical management.

Several factors were found to be significantly associated with anxiety and depression, including obesity, infertility concerns, and a sedentary lifestyle. Obesity has been previously linked to increased rates of psychological distress in PCOS patients, possibly due to body image dissatisfaction and metabolic complications[7]. Similarly, infertility concerns were associated with higher levels of anxiety and depression, which is consistent with existing literature highlighting the emotional burden of reproductive challenges in women with PCOS[8].

A sedentary lifestyle was also significantly correlated with increased anxiety and depression. Lack of physical activity has been associated with poor mental health outcomes, and previous studies have suggested that exercise interventions can help improve psychological well-being in PCOS patients[9]. Given these findings, promoting an active lifestyle and incorporating psychological counseling into PCOS management may help reduce the burden of mental health disorders.

The strengths of this study include the use of validated screening tools and a representative sample of PCOS patients. However, limitations should be acknowledged. The cross-sectional design prevents the establishment of causality, and self-reported measures may introduce bias. Future longitudinal studies should explore the temporal relationship between PCOS symptoms and psychological distress.

Overall, this study underscores the importance of addressing mental health issues in PCOS management. Healthcare providers should consider integrating psychological support into routine care and emphasizing lifestyle modifications to improve both physical and mental health outcomes in women with PCOS.

CONCLUSION

PCOS is not only a metabolic and reproductive disorder but also a condition with significant psychological consequences. The high prevalence of anxiety and depression among PCOS patients warrants greater awareness and mental health interventions. Future studies should explore longitudinal trends and intervention effectiveness in mitigating psychological distress.

REFERENCES

1. Azziz R, Carmina E, Chen Z, *et al*. Polycystic ovary syndrome. Nat Rev Dis Primers. 2016;2:16057.
2. Bozdag G, Mumusoglu S, Zengin D, Karabulut E, Yildiz BO. The prevalence and phenotypic features of PCOS: A systematic review and meta-analysis. Hum Reprod. 2016;31(12):2841-55.
3. Dokras A, Clifton S, Futterweit W, Wild R. Increased risk for abnormal depression scores in women with polycystic ovary syndrome: A systematic review and meta-analysis. Obstet Gynecol. 2011;117(1):145-52.
4. Barry JA, Kuczmierczyk AR, Hardiman PJ. Anxiety and depression in polycystic ovary syndrome: A systematic review and meta-analysis. Hum Reprod. 2011;26(9):2442-51.
5. Kerchner A, Lester W, Stuart SP, Dokras A. Risk of depression and other mental health disorders in women with polycystic ovary syndrome: A longitudinal study. Fertil Steril. 2009;91(1):207-12.
6. Cooney LG, Lee I, Sammel MD, Dokras A. High prevalence of moderate and severe depressive and anxiety symptoms in polycystic ovary syndrome: A systematic review and meta-analysis. Hum Reprod. 2017;32(5):1075-91.
7. Moran LJ, Ranasinha S, Norman RJ, Teede HJ, Boyle J. Lifestyle behavior and weight management interventions in Australian women with PCOS: Clinician practices and attitudes. Hum Reprod. 2014;29(2):330–7.
8. Rooney KL, Domar AD. The relationship between stress and infertility. Dialogues Clin Neurosci. 2018;20(1):41–7.
9. Vigorito C, Giallauria F, Palomba S, Cascella T, De Simone R, Lombardi G, *et al*. Beneficial effects of a three-month structured exercise training program on cardiopulmonary functional capacity in young women with polycystic ovary syndrome. J Clin Endocrinol Metab. 2007;92(4):1379-84.