

FREQUENCY OF DEPRESSION IN YOUNG WOMEN WITH POLYCYSTIC OVARIAN SYNDROME

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Abstract

OBJECTIVE

To determine the frequency of depression in young women with polycystic ovarian syndrome.

METHODOLOGY

A cross-sectional study was conducted from March to June 2025 at the Department of Obstetrics and Gynaecology, Sobhraj Maternity Hospital, Karachi, including 93 women aged 15–30 years diagnosed with polycystic ovarian syndrome using Rotterdam criteria. Participants were recruited through non-probability consecutive sampling. Depression was assessed using DSM-IV criteria. Demographic and clinical variables were recorded. Data were analysed using SPSS version 26 with descriptive statistics and chi-square testing, with $p \leq 0.05$ considered statistically significant.

RESULTS

The mean age of participants was 23.8 ± 4.2 years. Depression was observed in 40.9% of cases. A statistically significant association was found with marital status, with depression present in 55.6% of unmarried compared to 20.5% of married participants ($p=0.001$). No significant associations were observed with age group ($p=0.242$), obesity status ($p=0.071$), family income ($p=0.081$), or residential status ($p=0.316$).

CONCLUSION

Depression was frequently observed among young women with polycystic ovarian syndrome, indicating a considerable psychological burden associated with the condition. A statistically significant association was found between depression and marital status, whereas age, body mass index, family income, and residential status did not show significant associations. These findings highlight the need to consider psychosocial factors when evaluating women with polycystic ovarian syndrome.

INTRODUCTION

Polycystic ovarian syndrome (PCOS) is the most common endocrine disorder affecting women of reproductive age and is characterised by ovulatory dysfunction, hyperandrogenism, and polycystic ovarian morphology. The aetiology of PCOS is

multifactorial, involving genetic predisposition, insulin resistance, neuroendocrine dysregulation, and chronic low-grade inflammation. Beyond reproductive manifestations, PCOS is associated with significant metabolic and psychological morbidity, including obesity, type 2 diabetes

mellitus, cardiovascular risk, anxiety, and depression [1–3].

Depression has emerged as one of the most prevalent and debilitating psychiatric comorbidities in women with PCOS. Hormonal imbalance, hyperandrogenism, insulin resistance, body-image dissatisfaction, infertility concerns, and chronic disease burden collectively contribute to psychological distress in affected women [4,5]. Neuroendocrine alterations involving the hypothalamic-pituitary-adrenal axis and inflammatory cytokines have also been implicated in the pathophysiology of depression in PCOS [6]. Despite increasing recognition of the psychological impact of PCOS, depression often remains underdiagnosed due to overlapping somatic symptoms, social stigma, and limited routine mental health screening in gynaecological practice. Conventional diagnostic approaches primarily focus on reproductive and metabolic parameters, while psychological assessment is frequently overlooked, particularly in young women [7,8]. This diagnostic gap may result in delayed identification and suboptimal holistic management.

Existing literature suggests a higher prevalence of depression among women with PCOS compared to the general population; however, reported frequencies vary widely across studies and populations [9,10]. Sociocultural factors, healthcare access, and variations in diagnostic criteria contribute to this heterogeneity. In Pakistan, limited local data are available regarding the frequency of depression among young women with PCOS, particularly in public-sector tertiary care settings where the disease burden is substantial [2,11].

Given the rising prevalence of PCOS, its profound psychosocial impact, and the scarcity of region-specific evidence, it is essential to evaluate the frequency of depression among young women with PCOS in the local population. Such data are critical for improving awareness, early detection, and comprehensive management of affected individuals.

Therefore, the present study was conducted to determine the frequency of depression in young women with polycystic ovarian syndrome.

METHODOLOGY

This cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Sobhraj Maternity Hospital, Karachi, from March 2025 to June 2025, after approval of the synopsis by the College of Physicians and Surgeons Pakistan. Ethical approval was obtained from the Institutional Ethical Review Committee, and written informed consent was obtained from all participants. A total of 93 young women aged 15–30 years diagnosed with polycystic ovarian syndrome were enrolled through non-probability consecutive sampling. Polycystic ovarian syndrome was defined according to the Rotterdam criteria, requiring the presence of at least two of the following: oligo-ovulation or anovulation, clinical or biochemical hyperandrogenism, and polycystic ovaries on ultrasonography. Inclusion criteria comprised young women aged 15–30 years with a confirmed diagnosis of polycystic ovarian syndrome who consented to participate in the study. Exclusion criteria included women with a prior diagnosis of depression, anxiety disorders, bipolar disorder, or other psychiatric illnesses; those using antidepressants, antipsychotics, mood stabilisers, or hormonal medications; women with diabetes mellitus, hypertension, thyroid disorders, Cushing's syndrome, hyperprolactinaemia, chronic renal failure, or other systemic illnesses; pregnant or lactating women; women with substance abuse; and those unwilling to provide consent. Depression was defined according to DSM-IV criteria as the presence of five or more depressive symptoms persisting for at least two weeks. Baseline demographic and clinical characteristics including age, body mass index, marital status, residence, education level, occupation, family type, monthly household income, and duration of polycystic ovarian syndrome were recorded on a pre-designed proforma. Assessment for depression was carried out by the researcher and findings were documented accordingly. Data were analysed using SPSS-26 with descriptive statistics and stratified Chi-square testing, and $p \leq 0.05$ was considered statistically significant.

RESULTS

A total of 93 young women diagnosed with polycystic ovarian syndrome were included in the study. The mean age of the participants was 23.8 ± 4.2 years. With regard to marital status, 54 (58.1%) participants were unmarried and 39 (41.9%) were married. Obesity (BMI ≥ 25 kg/m²) was present in 41 (44.1%) participants, while 52 (55.9%) were non-obese. Most participants

belonged to urban areas (58; 62.4%), whereas 35 (37.6%) resided in rural areas. Regarding family income, 32 (34.4%) participants had a monthly income of less than PKR 50,000, while 61 (65.6%) reported an income of PKR 50,000 or above. Baseline demographic and clinical characteristics are summarized in **Table I**.

Table I: Baseline Demographic and Clinical Characteristics of Study Participants (n=93)		
Mean $\pm$ Standard Deviation		
Age in years = 23.8 ± 4.2		
Frequency (%)		
Marital Status	Married	39 (41.9%)
	Unmarried	54 (58.1%)
Obesity Status	Obese	41 (44.1%)
	Non-obese	52 (55.9%)
Residential Status	Urban	58 (62.4%)
	Rural	35 (37.6%)
Family Income	< PKR 50,000	32 (34.4%)
	$\geq$ PKR 50,000	61 (65.6%)

Overall, depression was identified in 38 participants, yielding a frequency of 40.9%. Stratified analysis demonstrated a statistically significant association between depression and marital status. Depression was observed in 30 (55.6%) unmarried participants compared to 8 (20.5%) married participants ($p=0.001$).

Depression was more frequent among participants aged ≤ 25 years (24; 46.2%) compared to those aged >25 years (14; 34.1%); however, this difference was not statistically significant ($p=0.242$). Similarly, depression was present in 21 (51.2%) obese participants and 17 (32.7%) non-obese participants, with no statistically significant association observed ($p=0.071$).

With respect to family income, depression was noted in 17 (53.1%) participants with monthly

income below PKR 50,000 compared to 21 (34.4%) participants with higher income; this difference did not reach statistical significance ($p=0.081$). Depression was also more frequent among urban residents (26; 44.8%) than rural residents (12; 34.3%), though the association was not statistically significant ($p=0.316$). The comparison of baseline demographic characteristics with depression status is presented in **Table II**.

Table II: Comparison of Baseline Demographic Characteristics with Depression Status (n=93)				
Baseline Demographic		Depression		P-Value
		Yes (n=38)	No (n=55)	
Age Group (years)	≤25	24 (46.2%)	28 (53.8%)	0.242
	>25	14 (34.1%)	27 (65.9%)	
Obesity Status	Obese	21 (51.2%)	20 (48.8%)	0.071
	Non-obese	17 (32.7%)	35 (67.3%)	
Marital Status	Married	8 (20.5%)	31 (79.5%)	0.001*
	Unmarried	30 (55.6%)	24 (44.4%)	
Family Income	< PKR 50,000	17 (53.1%)	15 (46.9%)	0.081
	≥ PKR 50,000	21 (34.4%)	40 (65.6%)	
Residential Status	Urban	26 (44.8%)	32 (55.2%)	0.316
	Rural	12 (34.3%)	23 (65.7%)	

DISCUSSION

Polycystic ovarian syndrome is a prevalent endocrine disorder among women of reproductive age and is increasingly recognised as a condition associated with substantial psychological morbidity in addition to its reproductive and metabolic manifestations. Depression is one of the most frequently reported psychiatric comorbidities in women with PCOS; however, it often remains underdiagnosed because of overlapping somatic symptoms, sociocultural stigma, and the lack of routine psychological screening in gynaecological practice [1–3]. This diagnostic challenge is particularly evident in low- and middle-income countries, where healthcare services predominantly focus on physical symptoms and mental health resources remain limited [2].

In the present study, depression was identified in 40.9% of young women with PCOS. This frequency closely aligns with previous regional and international findings. Tariq et al. reported depression in 42% of women with PCOS attending a tertiary care hospital in Karachi, demonstrating a comparable burden within a similar sociocultural context [2]. Greenwood et al. described depressive symptoms in approximately 30–50% of women with PCOS across different age

groups [4]. Importantly, Cooney et al. reported moderate to severe depressive symptoms in 36% of women with PCOS, highlighting that clinically significant depression is common in this population and supporting the magnitude of depression observed in the current study [14]. Lee et al. further demonstrated a significantly increased risk of major depressive disorder in women with PCOS compared with controls [5].

The study population consisted predominantly of young women, with a mean age of 23.8 ± 4.2 years, emphasising that psychological morbidity manifests early in the disease course. Stratified analysis demonstrated that marital status was the only variable significantly associated with depression. Depression was significantly more frequent among unmarried women (55.6%) compared with married women (20.5%, $p = 0.001$). This finding is clinically relevant and likely reflects sociocultural pressures related to marriage, fertility expectations, and perceived social acceptance, particularly in South Asian societies [2,8]. Barry et al. and Rassi et al. have similarly reported higher rates of depressive and anxiety disorders among unmarried women with PCOS, attributing this to psychosocial stressors, reduced social support, and concerns regarding reproductive potential [15,17].

Although depression was numerically more frequent among women aged ≤ 25 years (46.2%) compared with those aged >25 years (34.1%), this association did not reach statistical significance ($p = 0.242$). Greenwood et al. and Dokras have suggested that younger women with PCOS may experience heightened emotional vulnerability related to body image concerns, menstrual irregularities, and uncertainty regarding fertility; however, age alone may not independently predict depression when other sociodemographic factors are considered [4,13].

Obesity was associated with a higher proportion of depression (51.2%) compared with non-obese participants (32.7%), although this difference was not statistically significant ($p = 0.071$). Previous studies have demonstrated strong links between obesity, insulin resistance, chronic inflammation, and mood disturbances in PCOS, mediated through neuroendocrine and inflammatory pathways [6,11,12]. The absence of statistical significance in the present study may reflect limited sample size or confounding by other sociodemographic variables rather than a lack of biological association.

Similarly, family income and residential status did not show statistically significant associations with depression. Depression was more frequent among women from lower-income households (53.1%) than those from higher-income groups (34.4%, $p = 0.081$), and among urban residents compared with rural residents (44.8% vs 34.3%, $p = 0.316$). Comparable socioeconomic and environmental gradients have been reported previously, suggesting that chronic stress, financial insecurity, and urban lifestyle factors may influence psychological wellbeing in women with PCOS, even if not independently significant in smaller samples [10,16,18].

The strengths of this study include the use of standard diagnostic criteria for PCOS, systematic assessment of depression, and stratified analysis to explore associations with key demographic and clinical variables. Additionally, the study provides locally relevant data from a public-sector tertiary care hospital, addressing a recognised gap in Pakistani literature. However, limitations include the cross-sectional design, which precludes causal

inference, the single-centre setting, and a modest sample size that may have limited statistical power. Furthermore, depression severity and longitudinal outcomes were not assessed, and biochemical correlates of stress or inflammation were beyond the scope of this study [12,18].

Despite these limitations, the findings of the present study are consistent with existing evidence and reinforce the substantial psychological burden associated with PCOS. The high frequency of depression and its significant association with marital status strengthen existing literature and underscore the clinical value of recognising depression as an important comorbidity in young women with PCOS.

CONCLUSION

Depression was frequently observed among young women with polycystic ovarian syndrome, indicating a considerable psychological burden associated with the condition. A statistically significant association was found between depression and marital status, whereas age, body mass index, family income, and residential status did not show significant associations. These findings highlight the need to consider psychosocial factors when evaluating women with polycystic ovarian syndrome.

REFERENCES

- Gnawali A, Patel V, Cuellar-Ramírez A, Noor A, Rashid MY, Henin S, et al. Why are women with polycystic ovary syndrome at increased risk of depression? Exploring the etiological maze. *Cureus*. 2021;13(2).
- Tariq A, Malik MT, Tariq H, Khattak SN, Yazdani T, Malik RT, et al. Frequency and risk factors for depression and anxiety in patients with polycystic ovary syndrome presenting in a tertiary care hospital Karachi, Pakistan. *Obstet Gynecol Res*. 2021;4(4):196–202.
- Maya J, Siegel J, Cheng TQ, Rousseau-Pierre T. Prevalence and risk factors of polycystic ovarian syndrome among an ethnically diverse overweight/obese adolescent population. *Int J Adolesc Med Health*. 2022;34(1).

- Greenwood EA, Yaffe K, Wellons MF, Cedars MI, Huddleston HG. Depression over the lifespan in a population-based cohort of women with polycystic ovary syndrome: longitudinal analysis. *J Clin Endocrinol Metab.* 2019;104(7):2809-19.
- Lee IO, Kim JC, Seo JW, Pak HY, Chung JE. Risk of developing major depressive disorder in polycystic ovary syndrome: a retrospective cohort study. *J Obstet Gynaecol.* 2021;41(7):1157-61.
- Xing L, Xu J, Wei Y, Chen Y, Zhuang H, Tang W, et al. Depression in polycystic ovary syndrome: focusing on pathogenesis and treatment. *Front Psychiatry.* 2022;13:1001484.
- Jiskoot G, Dietz de Loos A, Beerthuis A, Timman R, Busschbach J, Laven J, et al. Long-term effects of a three-component lifestyle intervention on emotional well-being in women with polycystic ovary syndrome (PCOS): a secondary analysis of a randomized controlled trial. *PLoS One.* 2020;15(6):e0233876.
- Sadeeqa S, Mustafa T, Latif S. Polycystic ovarian syndrome-related depression in adolescent girls: a review. *J Pharm Bioallied Sci.* 2018;10(2):55-9.
- Lin H, Liu M, Zhong D, Ng EH, Liu J, Li J, et al. The prevalence and factors associated with anxiety-like and depression-like behaviors in women with polycystic ovary syndrome. *Front Psychiatry.* 2021;12:709674.
- Alkoudsi KT, Basheti IA. Prevalence of anxiety and depression among women with polycystic ovary syndrome living in war versus non-war zone countries: a randomized controlled trial assessing a pharmacist intervention. *Res Social Adm Pharm.* 2020;16(5):689-98.
- Alkoudsi KT, Basheti IA. Prevalence of anxiety and depression among women with polycystic ovary syndrome living in war versus non-war zone countries: a randomized controlled trial assessing a pharmacist intervention. *Res Social Adm Pharm.* 2020;16(5):689-98.
- Agarwal A, Rana M, Qiu E, AlBunni H, Bui AD, Henkel R. Role of oxidative stress, infection and inflammation in male infertility. *Andrologia.* 2018;50(11):e13126.
- Dokras A. Mood and anxiety disorders in women with PCOS. *Steroids.* 2012;77(4):338-41.
- 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.
- 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.
- Li Y, Li Y, Ng EH, Stener-Victorin E, Hou L, Wu T, et al. Polycystic ovary syndrome is associated with negatively variable impacts on domains of health-related quality of life: evidence from a meta-analysis. *Fertil Steril.* 2011;96(2):452-8.
- Rassi A, Veras AB, dos Reis M, Pastore DL, Bruno LM, Bruno RV, et al. Prevalence of psychiatric disorders in patients with polycystic ovary syndrome. *Compr Psychiatry.* 2010;51(6):599-602.
- Bazarganipour F, Ziaei S, Montazeri A, Foroozanfard F, Kazemnejad A, Faghihzadeh S, et al. Health-related quality of life in patients with polycystic ovary syndrome (PCOS): a model-based study of predictive factors. *J Sex Med.* 2014;11(4):1023-32.