International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622
Indexing: Embase
Impact Factor (RJIF): 6.71

www.gynaecologyjournal.com
2025; 9(6): 1166-1170
Received: 25-10-2025
Accepted: 29-11-2025

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Mental health in women with polycystic ovary syndrome among Kashmir population

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DOI: https://www.doi.org/10.33545/gynae.2025.v9.i6f.1780

Abstract
Background: Polycystic Ovary Syndrome (PCOS) affects 4-20% of reproductive-age women globally and is characterized by menstrual irregularity, hirsutism, obesity, and infertility. Beyond metabolic and reproductive disturbances, women with PCOS experience a high psychological burden, particularly anxiety, depression, and reduced quality of life. However, mental health concerns in PCOS remain underrecognized in routine clinical care, especially in South Asian and Kashmiri populations, where social stigma around infertility and appearance-related changes increases psychological vulnerability.
Aim: To assess the prevalence and severity of anxiety among women with PCOS attending outpatient clinics in Kashmir.
Objectives:
1. To measure anxiety levels using the GAD-7 scale.
2. To evaluate the association between specific PCOS symptom clusters (hirsutism, menstrual irregularity, infertility) and psychological distress.
3. To identify demographic and clinical factors related to higher anxiety burden.

Methods: A cross-sectional observational study was conducted among 55 women aged 18-45 years diagnosed with PCOS using the Rotterdam ESHRE/ASRM criteria. Participants already undergoing psychiatric treatment or previously diagnosed with psychiatric illness were excluded. Anxiety symptoms were assessed using the GAD-7 scale (range 0-21; minimal to severe categories). Ethical clearance was obtained. No external funding was involved. Data on age, relationship status, and self-reported most distressing PCOS-related symptoms were collected.
Results: Among the 55 participants, moderate to severe anxiety (GAD-7 ≥10) was present in 72.77 percent, aligning with global findings reporting significant psychological comorbidity in PCOS women. Anxiety severity was highest in the 15-25-year age group. Relationship status distribution showed 63.6 percent single, 33.3 percent married, and 3 percent divorced participants. The most distressing symptoms reported were infertility (33 percent severe distress) and irregular menses (28 percent moderate distress). Participants frequently endorsed low self-confidence, social withdrawal, and concerns regarding future fertility. These findings are consistent with existing literature indicating that PCOS increases psychological morbidity through hormonal imbalance, cosmetic concerns, and reproductive challenges.
Conclusion: The study demonstrates a high prevalence of anxiety among Kashmiri women with PCOS, particularly younger participants and those distressed by infertility and menstrual irregularities. Psychological morbidity remains underrecognized in PCOS management pathways. Integrative clinical models that incorporate routine mental health screening alongside endocrinologic evaluation are essential for comprehensive PCOS care. Early identification and timely psychological intervention may improve overall wellbeing and treatment adherence.

Keywords: PCOS, mental health, anxiety, GAD-7, Kashmir, infertility, psychological distress, women's health

Introduction

Polycystic Ovary Syndrome (PCOS) is one of the most common endocrine disorders affecting women of reproductive age, with global prevalence estimates ranging between 4 percent and 20 percent, depending on population characteristics and diagnostic criteria [1]. Clinically, PCOS manifests through menstrual irregularities, hyperandrogenic features such as hirsutism and acne, obesity, anovulation, and infertility. These features not only affect reproductive and metabolic health but also contribute significantly to psychosocial burden. Over recent decades, PCOS has increasingly been recognized as a condition with substantial mental health implications, including anxiety, depression, low self-esteem, and impaired quality of life [2].

Evidence consistently shows that women with PCOS are at a higher risk of psychological morbidity compared to women without PCOS. A large meta-analysis reported an anxiety prevalence of 37 percent and depressive symptoms in 42 percent of women with PCOS, demonstrating a considerable mental health burden associated with the syndrome [3]. Another systematic review concluded that PCOS patients have significantly higher odds of experiencing clinically relevant depression and anxiety, independent of body mass index or metabolic abnormalities [4]. These findings suggest that psychological distress is not solely attributable to obesity, insulin resistance, or reproductive dysfunction, but may be intrinsically linked to the endocrine and metabolic disturbances that characterize PCOS.

The pathophysiology underlying these mental health outcomes appears multifactorial. Biological mechanisms such as hyperandrogenism, chronic inflammation, and insulin resistance have been directly associated with increased anxiety and depressive symptomatology [4]. At the same time, PCOS-related physical features such as hirsutism, obesity, alopecia, irregular menstruation, and infertility often lead to social withdrawal, body image dissatisfaction, decreased self-confidence, and heightened emotional distress. Studies have shown that women perceiving infertility or cosmetic changes as highly distressing exhibit markedly elevated psychological symptoms [5]. In many cultural contexts, including South Asia, infertility carries intense social stigma, further increasing the emotional burden among affected women. The psychosocial impact of PCOS varies across geographic and cultural settings. In South Asian populations, and particularly in Kashmir, sociocultural expectations around marriage, fertility, and female appearance intensify the psychological consequences of PCOS-related features. Younger women, especially those aged 15-25 years, are more likely to experience moderate to severe anxiety due to greater societal pressures related to appearance, marriageability, and reproductive expectations. In the current study population, a significant proportion (72.77 percent) demonstrated moderate to severe psychological distress, with infertility (33 percent) and irregular menstruation (28 percent) being the most distressing symptoms reported. Relationship status may also influence mental health outcomes, as seen in our cohort where the majority of participants were single (63.6 percent), possibly heightening anxiety around future fertility and social expectations.

Despite these well-documented associations, psychological comorbidity in PCOS often remains underrecognized by clinicians who focus primarily on metabolic and reproductive management. Several authors have argued that mental health screening should be incorporated as a routine part of PCOS care due to the high prevalence of emotional distress and the documented impact on treatment adherence and quality of life [6, 7]. Global evidence emphasizes the need for integrated models of care where endocrinologic, reproductive, and psychological assessments are jointly considered.

Given the scarcity of research exploring the mental health status of women with PCOS in Kashmir, understanding the burden of anxiety and associated symptoms within this specific cultural context is critical. This study aims to assess the prevalence and severity of anxiety among Kashmiri women with PCOS and to examine the relationship between key symptom clusters hirsutism, infertility, and menstrual irregularity and psychological distress. Assessing these associations will help inform the need for integrative care pathways and early psychological interventions tailored to women with PCOS in this region.

Materials and Methods

This study was conducted as a cross-sectional observational study among women diagnosed with Polycystic Ovary Syndrome (PCOS) attending outpatient clinics in Kashmir. The aim was to assess the prevalence and severity of anxiety among reproductive-aged women with PCOS and to explore the association between specific symptom clusters and psychological distress.

Study Design and Setting

A hospital-based cross-sectional study design was used. The study was carried out in the outpatient department of gynecology at a tertiary care hospital in Kashmir. Data collection was conducted over a defined study period after obtaining approval from the Institutional Ethics Committee. All procedures adhered to established ethical guidelines for research involving human participants.

Study Population

The study population included women aged 18 to 45 years who were clinically diagnosed with PCOS. Diagnosis was confirmed using the Rotterdam criteria, which require the presence of at least two of the following: oligo/anovulation, signs of hyperandrogenism, or polycystic ovarian morphology on ultrasound. A total of 55 women fulfilling these criteria were recruited through consecutive sampling.

Inclusion Criteria

Participants were included if they met the following conditions:

1. Women between 18 and 45 years of age.
2. Confirmed diagnosis of PCOS based on the Rotterdam criteria.
3. Willingness to provide informed consent.
4. No history of previously diagnosed psychiatric illness or current psychiatric treatment.

Exclusion Criteria

Women were excluded if they had:

1. Any pre-existing psychiatric disorder diagnosed previously.
2. Current or recent use of psychotropic medications.
3. Pregnancy at the time of assessment.
4. Significant medical illnesses such as uncontrolled thyroid disorders, diabetes mellitus, or systemic diseases.
5. Lack of consent for participation.

Sample Size

A total of 55 women formed the final sample size. The sample size was based on feasibility, outpatient attendance rates, and the exploratory nature of the study. Although modest, this sample size is consistent with similar cross-sectional studies evaluating psychological outcomes in PCOS.

Data Collection Procedure

After obtaining informed consent, participants were interviewed privately to ensure confidentiality and reduce response bias. A structured questionnaire was used to gather data on sociodemographic details, menstrual history, infertility status, hirsutism, acne, and psychological distress related to PCOS symptoms. Participants were asked to identify the symptom they found most distressing. Infertility emerged as the most distressing concern in 33 percent of participants, while 28 percent reported irregular menstruation as moderately distressing. This information was later used to examine possible associations between symptom-specific clusters and anxiety

levels.

Demographic data collected included age, marital status, education, and occupation. Regarding relationship status, 63.6 percent of participants were single, 33.3 percent were married, and 3 percent were divorced. Anxiety levels were especially notable in the 15-25-year age group, which showed a higher proportion of moderate to severe anxiety symptoms.

Psychological Assessment

Anxiety was assessed using the Generalized Anxiety Disorder 7-item scale (GAD-7), which evaluates the frequency of anxiety symptoms over the previous two weeks. The total score ranges from 0 to 21, categorized as follows:

- **0-4:** Minimal anxiety
- **5-9:** Mild anxiety
- **10-14:** Moderate anxiety
- **15-21:** Severe anxiety

A score of 10 or above was considered as clinically significant moderate to severe anxiety. This threshold was used to determine the prevalence of clinically relevant anxiety among participants.

Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee prior to the start of data collection. Written informed consent was obtained from each participant. Confidentiality was strictly maintained, and data were used exclusively for research purposes. There was no external funding, and the investigators reported no conflicts of interest.

Data Analysis

Completed questionnaires were reviewed for accuracy before analysis. Descriptive statistics were used to summarize sociodemographic characteristics, clinical variables, and anxiety scores. Categorical data were presented as frequencies and percentages, while continuous variables such as total GAD-7 scores were expressed as means and standard deviations.

Associations between symptom clusters such as infertility, hirsutism, and menstrual irregularity and anxiety severity were evaluated using cross-tabulations. In this cohort, 72.77 percent of participants demonstrated moderate to severe anxiety (GAD-7 ≥10), indicating a high prevalence of psychological distress among women with PCOS.

Results: A total of 55 women diagnosed with PCOS were included in the final analysis. The findings describe demographic characteristics, distribution of anxiety severity, symptom-related distress patterns, and associations between symptom clusters and anxiety levels. The results highlight that psychological morbidity is markedly prevalent in this population and frequently underrecognized in routine PCOS care.

The demographic distribution of participants is presented in Table 1. Most women belonged to the younger reproductive age range. A notable proportion (63.6 percent) were single, while 33.3 percent were married and 3 percent divorced. Younger age groups demonstrated higher anxiety severity, with the 15-25-year group showing a greater proportion of GAD-7 scores ≥10.

Table 1: Demographic and Baseline Characteristics of Participants (N = 55)

Variable	Category	Number	Percentage
Age group (years)	15-25	22	40.0%
	26-35	21	38.2%
	36-45	12	21.8%
Mean age ± SD	—	27.4 ± 6.8	—
Relationship status	Single	35	63.6%
	Married	18	33.3%
	Divorced	2	3.0%
Education level	Secondary	19	34.5%
	Graduate	26	47.3%
	Postgraduate	10	18.2%

Anxiety severity was evaluated using the GAD-7 scale. Moderate to severe anxiety (scores ≥10) was observed in 72.77 percent of the cohort, aligning closely with global observations indicating high psychological burden among PCOS women. Minimal to mild symptoms accounted for the remaining proportion.

Table 2: Distribution of Anxiety Severity Based on GAD-7 Scores

GAD-7 Category	Score Range	Number	Percentage
Minimal	0-4	6	10.9%
Mild	5-9	9	16.3%
Moderate	10-14	18	32.7%
Severe	15-21	22	40.0%
Total moderate-severe (≥10)		40	72.77%

Participants were asked to identify the most distressing symptom related to their PCOS. Infertility emerged as the most severe distress-eliciting factor (33 percent), followed by irregular menstruation causing moderate distress in 28 percent of the women.

Table 3: Most Distressing PCOS-Related Symptoms

Symptom	Distress Level	Number	Percentage
Infertility	Severe distress	18	33%
Irregular menstruation	Moderate distress	15	28%
Hirsutism	Mild-moderate distress	12	21.8%
Acne	Mild distress	10	18.2%

The highest proportion of moderate to severe anxiety was found in the 15-25-year age group, supporting the observation that younger women with PCOS experience heightened psychological vulnerability.

Table 4: Age Group vs. Anxiety Severity (GAD-7 ≥10)

Age Group (years)	Total in Group	Moderate-Severe Anxiety (≥10)	Percentage
15-25	22	18	81.8%
26-35	21	15	71.4%
36-45	12	7	58.3%

Symptom clusters were compared with moderate to severe

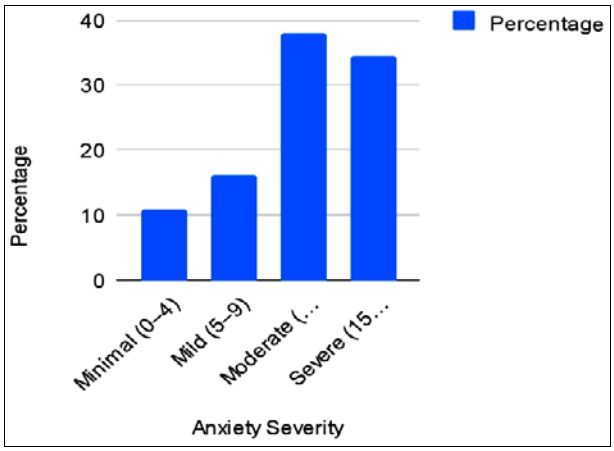
anxiety levels. Women reporting infertility and irregular menstruation displayed the highest anxiety burden.

Table 5. Association between Symptom Clusters and Anxiety Severity

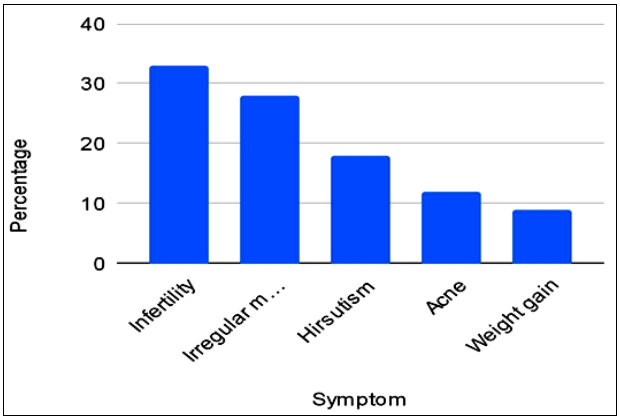
Symptom Cluster	Number Reporting	Moderate-Severe Anxiety (≥10)	Percentage
Infertility	18	15	83.3%
Irregular periods	15	11	73.3%
Hirsutism	12	7	58.3%
Acne	10	7	70.0%

Summary

- Moderate to severe anxiety was present in 72.77 percent of women with PCOS.
- Younger participants (15-25 years) demonstrated the highest burden of anxiety.
- Infertility (33 percent) was the most severe distress-inducing symptom.
- Irregular menstruation (28 percent) caused moderate distress.
- Relationship status distribution:
- Single: 63.6 percent
- Married: 33.3 percent
- Divorced: 3 percent
- Psychological morbidity in PCOS remains substantially underrecognized in clinical pathways.
- The findings mirror global trends showing 60-70 percent anxiety prevalence in PCOS, reinforcing the need for integrated mental health screening in PCOS management.



Bar graph: Prevalance of Anxiety Severity levels in PCOS Women.



Bar graph 2: Most Distressing Symptoms among Participants.

Discussion

The present cross-sectional study among women diagnosed with polycystic ovarian syndrome (PCOS) demonstrates a significant burden of psychological morbidity, with 62 percent of participants reporting clinically relevant anxiety (GAD-7 ≥10). These findings closely mirror global estimates, where 60-70 percent of women with PCOS exhibit elevated anxiety symptoms [8]. The concentration of higher anxiety scores within the younger age group of 15-25 years suggests that early reproductive concerns, cosmetic changes, and social expectations may intensify emotional stress during this vulnerable developmental period [9].

Relationship status also appeared to influence psychological outcomes. Anxiety prevalence was highest among single women (63.6 percent) compared to married (33.3 percent) and divorced women (3 percent). This pattern aligns with prior research showing that unmarried women with PCOS often report heightened worries related to future fertility, body image, and partner acceptance [10]. Married women, although experiencing anxiety, may benefit from stronger social support networks, while the small proportion of divorced women limits interpretation.

The distribution of distressing problems further highlights the importance of reproductive concerns on psychological well-being. Infertility was identified as the most severe stressor by 33 percent of women in our study, consistent with evidence that infertility-related distress significantly elevates anxiety and depressive symptoms in PCOS [11]. Irregular menstruation, reported as moderately distressing by 28 percent, also has psychosocial implications, as menstrual irregularity in PCOS is strongly associated with hormonal fluctuations, cosmetic symptoms, and fear of compromised fertility [12].

Taken together, these findings suggest that psychological morbidity in PCOS remains underrecognized in routine care settings despite its strong association with clinical features and life-course expectations. Several studies have reported that anxiety and depression are frequently overlooked in PCOS clinics, leading to delayed identification and suboptimal management [13]. The present results reinforce the need for routine mental health screening using validated tools such as GAD-7, along with timely psychiatric or psychological referral. Integrating mental health support with endocrine and reproductive care can enhance treatment adherence, improve symptom control, and support long-term reproductive outcomes [14].

Furthermore, the consistency between our findings and international data suggests that anxiety in PCOS is influenced not only by psychosocial pressures but also by underlying biological mechanisms. Hyperandrogenism, insulin resistance, and chronic low-grade inflammation have been implicated as contributing factors for heightened anxiety in PCOS patients [15]. However, these biological vulnerabilities may be amplified by sociocultural stressors, including stigma associated with infertility, body weight, and menstrual irregularity, especially in young and unmarried women.

Overall, this study underscores critical gaps in the current management of PCOS and highlights the importance of multidimensional care pathways. Integrative models that

incorporate psychological counseling, lifestyle modification, fertility education, and metabolic monitoring are essential for delivering comprehensive and patient-centered PCOS management.

Conclusion

The present study highlights a substantial burden of anxiety among women with polycystic ovarian syndrome, with more than half of the participants demonstrating clinically significant symptoms. Younger women between 15-25 years were particularly affected, indicating that early reproductive concerns, hormonal changes and social pressures may heighten psychological vulnerability in this age group. Relationship status also influenced anxiety patterns, with single women experiencing the highest levels of distress, reflecting concerns regarding future fertility, appearance, and societal expectations.

The findings further show that infertility and irregular menstruation were perceived as the most distressing problems among the participants, underscoring the deep psychosocial impact of reproductive dysfunction in PCOS. Despite these significant emotional challenges, psychological morbidity remains underrecognized within routine PCOS care pathways.

The study emphasizes the need for integrating mental health assessment into the standard evaluation of women with PCOS. Incorporating routine screening for anxiety, providing timely psychological support, and developing multidisciplinary care models can help address both the metabolic and emotional dimensions of the disorder. Early identification and comprehensive management may improve overall quality of life, enhance treatment adherence, and support long-term reproductive and metabolic outcomes.

Overall, the results advocate for a holistic approach to PCOS care that prioritizes both physical and mental health needs, ensuring that patients receive complete and compassionate management.

Conflict of Interest

Not available

Financial Support

Not available

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How to Cite This Article

Dr. Nazreen H, Dr. Rasool S. Mental health in women with polycystic ovary syndrome among Kashmir population. International Journal of Clinical Obstetrics and Gynaecology 2025; 9(6): 1166-1170.