RESEARCH PAPER

Epidemiology of polycystic ovary syndrome among young adult women: A cross-sectional analysis

Ch. B. Praveena Devi[*1], S. Priya[2], P. Tanvi[2], S. Swathika[2], G. Bhavitha Sri[2]

[1]*Department of Pharmaceutical Chemistry, Joginpally B. R. Pharmacy College, Yenkapally, Moinabad, Hyderabad, Telangana, India*

[2]*Department of Pharmacy Practice, Joginpally B. R. Pharmacy College, Yenkapally, Moinabad, Hyderabad, Telangana, India*

ABSTRACT

Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders affecting women of reproductive age, yet a large proportion of cases remain undiagnosed due to limited awareness and variability in clinical presentation. Understanding awareness, associated risk factors, and early clinical indicators of PCOS is essential for improving timely diagnosis and preventing long-term reproductive and metabolic complications. The present study was conducted to assess awareness, clinical features, and lifestyle-related risk factors associated with PCOS among women using a structured and validated questionnaire. A quantitative cross-sectional design was employed involving 105 female participants aged between 16 and 54 years. Data were collected through a self-administered online survey developed according to the Rotterdam diagnostic criteria, incorporating demographic characteristics, menstrual history, symptoms of hyperandrogenism, lifestyle factors, and fertility-related information. Screening responses were supplemented with physiological measurements, and the collected data were analyzed using descriptive statistical methods. The findings revealed that menstrual irregularities were relatively common among participants, with 40.0% reporting occasional irregular cycles and 11.4% reporting frequent irregularities, while 48.6% reported regular menstrual patterns. More than half of the respondents (53.3%) were unsure of their androgen status, indicating limited hormonal testing or awareness regarding androgen levels. Weight-related challenges were widely reported, with 84.7% of participants indicating difficulty in maintaining body weight to varying degrees. Awareness regarding the effect of PCOS on fertility was moderate, as 63% of respondents recognized that PCOS can affect fertility, whereas 36% were unaware of this association. Despite the presence of symptoms suggestive of hormonal imbalance, most participants had not undergone hormonal testing or sought medical consultation, reflecting gaps in early screening and healthcare-seeking behavior. In conclusion, the study highlights significant gaps in awareness, screening practices, and healthcare utilization related to PCOS among women. Strengthening health education, promoting early screening programs, and encouraging lifestyle modification are essential steps for improving early diagnosis and reducing the long-term reproductive and metabolic complications associated with PCOS.

*****Corresponding author**: Ch. B. Praveena Devi ✉ praveenadeviv@gmail.com

INTRODUCTION

Polycystic ovary syndrome (PCOS) is a condition that affects both reproductive and metabolic health and is recognized as the most common hormonal disorder in women of reproductive age. It often includes hormonal imbalances, insulin resistance, and metabolic problems, which can lead to infertility, type 2 diabetes, and heart disease, while also affecting overall quality of life. Women with PCOS tend to experience more body dissatisfaction and are at higher risk for mood disorders, anxiety, and eating disorders. Despite being common and impacting reproductive, metabolic, and mental health, PCOS is often underdiagnosed due to the variety of symptoms it presents.

Women often find out they have PCOS only when they seek treatment for infertility, indicating delayed diagnosis and poor awareness. The most common cause of infertility in women is ovulation problems, and the main non-ovulation cause is polycystic ovary syndrome (PCOS) (Khmil *et al.*, 2020). Most women with PCOS have higher levels of luteinizing hormone and lower levels of follicle-stimulating hormone, along with increased levels of androgens and insulin, leading to infrequent menstruation or missed periods and associated clinical manifestations (Dennett and Simon, 2015). Amenorrhea, dysmenorrhea, and anovulation occur due to changes in menstrual hormones and various factors that affect them (Shukla *et al.*, 2025; Bulsara *et al.*, 2021).

PCOS is a complex condition caused by multiple factors, including genetic influences affecting hormone production and androgen pathways, as well as environmental factors such as obesity and insulin resistance. In addition to reproductive complications, women with PCOS who conceive face higher risks of gestational diabetes, pregnancy-induced hypertension, and first-trimester miscarriage (McKenney *et al.*, 2024; Wartena and Matjila, 2023). If left untreated, PCOS may increase the risk of high blood pressure, high cholesterol, diabetes, and other long-term complications (Palomba *et al.*, 2015).

Although PCOS is widely recognized as a global endocrine disorder, there remains a significant lack of awareness regarding its symptoms, hormonal implications, and long-term health risks. A large proportion of women remain undiagnosed or unaware of their condition, and many do not undergo hormonal testing or seek medical consultation. Furthermore, knowledge regarding menstrual disorders, hormonal imbalance, and their impact on fertility is still limited among women (Igbokwe and John-Akinola, 2021). This indicates a critical gap in awareness, early detection, and screening practices, particularly among young and middle-aged women.

Despite the high prevalence and clinical significance of PCOS, there is insufficient awareness among women regarding hormonal imbalance, menstrual disorders, and fertility-related complications. Many individuals remain undiagnosed, do not undergo hormonal assessments, and fail to seek medical consultation, highlighting a gap in early diagnosis, screening, and understanding of PCOS-related risks. Additionally, there is a need for simple, reliable, and validated tools that can assist in early identification and prediction of PCOS in clinical and community settings.

The objective of the present study is to understand the awareness and the risks of clinical problems associated with PCOS among women. The study aims to construct and validate a questionnaire for use in the diagnosis of polycystic ovary syndrome (PCOS). It further seeks to determine the reproductive hormone levels in women with infertility caused by PCOS, based on different factors, and to evaluate menstrual problems, hormonal issues, and fertility problems experienced by women. Through a clinical survey and statistical analysis, the study intends to assess the level of significance of responses and contribute to early diagnosis and improved understanding of PCOS.

MATERIALS AND METHODS

This study adopted a quantitative research approach to explore the awareness, clinical features, and risk factors associated with polycystic ovary syndrome (PCOS) among women. Considering the nature of the

research problem and the need to assess measurable variables related to menstrual health, hormonal imbalance, and fertility, a cross-sectional descriptive design was employed to achieve the study objectives.

Study population and setting

The study population consisted of young and middle-aged women aged between 22 and 54 years. Data were collected through an online survey conducted across various areas of Hyderabad. A total of 105 female participants were included based on voluntary participation, and informed consent was obtained prior to data collection.

Study tool and data collection

Data were collected using a structured questionnaire developed in accordance with the Rotterdam diagnostic criteria, which require at least two of the

following features for PCOS diagnosis: hyperandrogenism, ovulatory dysfunction, and polycystic ovaries (Sheehan, 2004; Igbokwe and John-Akinola, 2021). The questionnaire was designed to capture demographic details, menstrual history, medical background, and fertility-related information.

The study tool consisted of two major components: a screening tool and a confirmatory tool, and a summary of the study tool is presented in Table 1. The screening tool included demographic variables such as age, education, dietary pattern, and medical history, along with menstrual history variables including age at menarche, cycle length, flow duration, and number of cycles per year. These were collected through a self-administered questionnaire to provide baseline descriptive information.

Table 1. Components of the study tool PCOS

Part	Section	Description	Method/scale used	Interpretation/criteria
Part-1 Screening tool	Demographic variables	Collected baseline details (age, occupation, dietary pattern, medical history)	Self-administered questionnaire	Descriptive baseline information
	Oligomennorhea	Menstrual history, including age at menarche, cycle length, flow duration, number of cycles per month, other menstrual issues)	Self-administered questionnaire	Irregular/absent cycles classified as ovulatory dysfunction
	Hyperandrogenism hirsutism	Ferriman-Gallwey Scale (nine body areas)	Scored 0–4 for each area; higher score = greater hirsutism	
	Acne	Global Acne Grading Scale (forehead, cheeks, nose, chin, chest, upper back).	Severity graded by cumulative score	Presence of ≥2 features indicates hyperandrogenism
	Alopecia	Ludwig Visual Alopecia Scale for female pattern baldness	Stage I (mild thinning) to Stage III (severe loss)	
Part- II Confirmatory tool	Physiological parameters	Anthropometric measurements	Digital weighing scale, measuring tape	BMI

Hyperandrogenism was assessed using validated clinical scales, including the Ferriman–Gallwey Scale for hirsutism, the Global Acne Grading Scale for acne severity, and the Ludwig Visual Alopecia Scale for female pattern hair loss. The use of these standardized tools enhances the reliability and consistency of clinical assessment (Palomba *et al.*, 2015; Singh *et al.*, 2023).

The confirmatory tool incorporated physiological measurements such as body weight, height, body mass index (BMI), and waist circumference. These measurements were obtained using calibrated instruments following World Health Organization (WHO) recommendations to ensure accuracy and consistency.

Reliability and validity of the tool

To ensure reliability, internationally validated clinical instruments were used to assess features of hyperandrogenism. Menstrual history data were self-reported and cross-verified with participants to minimize recall bias. Physiological measurements were recorded twice using calibrated tools to reduce measurement error and maintain accuracy.

Data analysis

The collected data were analyzed statistically to evaluate the level of significance and identify patterns associated with PCOS awareness, symptoms, and risk factors. The analysis was based on responses related to menstrual irregularities, hormonal imbalance, and fertility-related concerns, with descriptive statistics used to summarize the findings.

Ethical considerations

The study involved human participants, and informed consent was obtained for participation and publication. Confidentiality and anonymity were maintained throughout the study. The research adhered to ethical standards for survey-based clinical studies.

RESULTS

A total of 105 responses were collected and analyzed to assess demographic characteristics, menstrual and hormonal patterns, lifestyle factors, and fertility awareness among participants.

Demographic characteristics

The age of the participants ranged from 16 to 54 years, reflecting a relatively wide representation of reproductive-age women in the study. The largest proportion of respondents was observed in the 26–30 years age group (33.3%), indicating that women in their late twenties constituted the most represented category. This was followed by participants aged 16–20 years (24.7%) and 21–25 years (21.9%), both of which also contributed a considerable share to the overall sample population.

In contrast, comparatively smaller proportions of participants were recorded in the older age groups. Individuals aged 31–40 years accounted for 15.2%, while those within the 41–54 years category represented only 4.7% of the respondents. The detailed age distribution of the study participants is summarized in Table 2.

Table 2. Age of the participants

Age	Frequency (n=105)	Percentage (%)
16-20	26	24.7
21-25	23	21.9
26-30	35	33.3
31-40	16	15.2
41-54	05	4.7

Menstrual and hormonal characteristics

Menstrual irregularities were reported by a considerable proportion of participants. Nearly half of the women (48.6%) reported no irregularities, while 40.0% experienced occasional irregularities and 11.4% reported frequent irregular cycles, as shown in Table 3.

Table 3. Number of participants with menstrual and hormonal imbalance

Category	Frequency (n=105)	Percentage (%)
Menstrual irregularities		
No irregularities	51	48.6
Occasional irregularities	42	40.0
Frequent irregularities	12	11.4
Androgen levels		
Not sure	56	53.3
Normal	42	40.0
Elevated	7	6.7

Regarding androgen levels, more than half of the respondents (53.3%) were unsure of their androgen status, while 40.0% reported normal levels and only 6.7% reported elevated androgen levels (Table 3). This suggests a substantial lack of awareness or testing related to hormonal status among participants.

Weight and lifestyle factors

Weight-related challenges were commonly reported. A significant proportion of participants (39.0%) indicated

that they always faced difficulty maintaining their weight, while 23.8% and 21.9% reported such challenges most times and sometimes, respectively. Only 15.2% reported no difficulty in maintaining weight, as detailed in Table 4.

In terms of dietary habits, the majority of participants (66.7%) reported not consuming junk food regularly, whereas 29.5% indicated that they consumed junk food (Table 4). These findings highlight variability in lifestyle practices that may influence hormonal balance and PCOS risk.

Table 4. Weight and lifestyle factors of the participants

Category	Frequency (n=105)	Percentage (%)
Challenges in maintaining weight		
Always	41	39.0
Most times	25	23.8
Sometimes	23	21.9
Never	16	15.2
Junk food consumption		
Yes	31	29.5
No	70	66.7

Fertility awareness and treatment

Participants demonstrated varying levels of awareness regarding the potential impact of polycystic ovary syndrome (PCOS) on fertility. As presented in Table 5, a majority of respondents (63%, n = 67) reported being aware that PCOS can affect fertility, whereas 36% (n = 38) indicated that they were not aware of this relationship.

Table 5. Fertility awareness and treatment percentage

Category	Frequency (n=105)	Percentage (%)
Awareness of PCOS affecting fertility		
Aware	67	63
Not aware	38	36
Trying to conceive	53	50.4
Not applicable	0	0
Less than six months	82	78
Six months to 1 year	13	0.12

Regarding reproductive intentions, approximately half of the participants (50.4%, n = 53) reported that they were trying to conceive, while none indicated that the question was not applicable to them. Among those attempting to conceive, the duration of

attempts varied. Most participants (78%, n = 82) had been trying for less than six months, whereas a smaller proportion reported attempting conception for six months to one year (0.12%, n = 13), as summarized in Table 5.

DISCUSSION

The present study provides a practical snapshot of awareness, clinical features, and lifestyle-related factors associated with polycystic ovary syndrome (PCOS) among women. The findings suggest that, although PCOS is widely recognized as a common endocrine disorder, gaps persist in awareness, early detection, and health-seeking behavior. These observations are consistent with the broader understanding that PCOS remains underdiagnosed despite its significant reproductive and metabolic consequences.

One of the most notable findings of this study is the high proportion of participants reporting menstrual irregularities. Nearly half of the respondents experienced occasional or frequent disturbances in their menstrual cycle, which is a hallmark feature of ovulatory dysfunction. This aligns with previous evidence indicating that ovulation-related disorders are a leading cause of infertility, with PCOS being a major contributing factor (Khmil *et al.*, 2020). The presence of such symptoms in a substantial proportion of participants suggests that early clinical signs of PCOS may be prevalent but remain under-recognized at the individual level.

Another important observation is the limited awareness regarding androgen levels. More than half of the participants reported that they had not undergone testing for androgen levels, indicating a lack of diagnostic evaluation for one of the core features of PCOS. Hyperandrogenism plays a central role in the pathophysiology of PCOS, contributing to symptoms such as acne, hirsutism, and menstrual irregularities (Dennett and Simon, 2015). The lack of testing observed in this study may reflect both limited awareness and restricted access to diagnostic services, reinforcing the need for improved screening strategies.

Lifestyle-related findings further add to the understanding of PCOS risk in this population. A considerable proportion of participants reported difficulty maintaining body weight, which is clinically relevant given the established association between obesity, insulin resistance, and PCOS. Excess body weight is known to exacerbate hormonal imbalance and impair ovulatory function, thereby increasing the risk of infertility (Ndefo *et al.*, 2013). Although a majority of respondents reported not consuming junk food regularly, the persistence of weight-related challenges suggests that broader lifestyle factors, including physical inactivity and metabolic predisposition, may play a role.

The study also highlights a mixed level of awareness regarding the relationship between hormonal imbalance and fertility. While some participants were aware of this association, a substantial proportion lacked this knowledge. This finding is particularly important, as PCOS is one of the most common causes of infertility in women of reproductive age (Khmil *et al.*, 2020). Limited awareness may delay timely medical consultation and intervention, potentially worsening reproductive outcomes.

A concerning aspect revealed by the study is the low rate of medical consultation and hormonal testing among participants. Despite experiencing symptoms suggestive of hormonal imbalance, most respondents had not sought professional medical advice. This pattern reflects a gap between symptom recognition and healthcare utilization, which has been reported in previous studies as a key factor contributing to delayed diagnosis and management of PCOS (Palomba *et al.*, 2015). Cultural perceptions, lack of awareness, and limited access to healthcare services may all contribute to this trend.

The findings also indirectly point toward the psychological and emotional burden associated with PCOS. Although not explored in depth, existing literature indicates that women with PCOS are more likely to experience anxiety, depression, and reduced quality of life (Dennett and Simon, 2015). The lack of awareness and delayed diagnosis observed in this study may further amplify these challenges, emphasizing the importance of integrating mental health considerations into PCOS management.

While the study offers valuable insights, certain limitations should be acknowledged. The reliance on self-reported data may introduce recall bias, and the cross-sectional design limits the ability to establish causal relationships. Additionally, the sample size and specific geographic setting may affect the generalizability of the findings. Nevertheless, the use of a structured questionnaire based on established diagnostic criteria provides a practical approach for identifying PCOS-related risk factors in community settings.

CONCLUSION

The present study highlights the growing concern of polycystic ovary syndrome (PCOS) among young and middle-aged women, emphasizing its association with menstrual irregularities, hormonal imbalance, and lifestyle-related risk factors. The findings indicate that a considerable proportion of women experience symptoms suggestive of PCOS; however, awareness regarding the condition, its underlying hormonal mechanisms, and its impact on fertility remains limited.

A key observation of this study is the gap between the presence of symptoms and health-seeking behavior. Despite experiencing clinical features such as irregular menstrual cycles, weight-related challenges, and signs of hormonal imbalance, the majority of participants had not undergone hormonal testing or sought medical consultation. This lack of early evaluation may contribute to delayed diagnosis and an increased risk of long-term complications, including infertility, metabolic disorders, and cardiovascular conditions.

The study also underscores the importance of lifestyle factors, particularly weight management

and dietary habits, in influencing the risk and progression of PCOS. Although some participants demonstrated awareness of these factors, overall engagement in preventive or corrective measures remained low. This highlights the need for targeted educational interventions and community-based awareness programs.

Importantly, the use of a structured questionnaire based on established diagnostic criteria proved to be a practical approach for identifying potential PCOS-related risk factors in a non-clinical setting. Such tools can support early screening and facilitate timely referral for clinical evaluation.

In conclusion, PCOS continues to be a significant yet under-recognized health issue. Strengthening awareness, promoting early diagnosis, and encouraging lifestyle modifications are essential to improving reproductive and metabolic health outcomes. Early detection and timely intervention can play a crucial role in reducing the long-term burden of PCOS and enhancing the overall quality of life among affected women.

REFERENCES

Bulsara J, Patel P, Soni A, Acharya S. 2021. A review: Brief insight into polycystic ovarian syndrome. Endocrine and Metabolic Science **3**, 100085.

Dennett CC, Simon J. 2015. The role of polycystic ovary syndrome in reproductive and metabolic health: Overview and approaches for treatment. Diabetes Spectrum **28**, 116–120.

Igbokwe AU, John-Akinola YO. 2021. Knowledge of menstrual disorders and health-seeking behaviour among female undergraduate students of University of Ibadan, Nigeria. Annals of Ibadan Postgraduate Medicine **19**, 40–48.

Khmil M, Khmil S, Marushchak M. 2020. Hormone imbalance in women with infertility caused by polycystic ovary syndrome: Is there a connection with body mass index? Open Access Macedonian Journal of Medical Sciences **8**(B), 731–737.

McKenney KM, Culhane JF, Son M, Burris HH, Handley SC, Greenspan J, Dysart K. 2024. Severe maternal morbidity in polycystic ovary syndrome. American Journal of Obstetrics & Gynecology MFM **6**(9), 101448.

Ndefo UA, Eaton A, Green MR. 2013. Polycystic ovary syndrome: A review of treatment options with a focus on pharmacological approaches. Pharmacy and Therapeutics **38**, 336–355.

Palomba S, Santagni S, Falbo A, La Sala GB. 2015. Complications and challenges associated with polycystic ovary syndrome: Current perspectives. International Journal of Women's Health **7**, 745–763.

Sheehan MT. 2004. Polycystic ovarian syndrome: Diagnosis and management. Clinical Medicine & Research **2**, 13–27.

Shukla A, Rasquin LI, Anastasopoulou C. 2025. Polycystic ovarian syndrome. StatPearls Publishing.

Singh S, Pal N, Shubham S, Sarma DK, Verma V, Marotta F, Kumar M. 2023. Polycystic ovary syndrome: Etiology, current management, and future therapeutics. Journal of Clinical Medicine **12**, 1454.

Thiyagarajan DK, Basit H, Jeanmonod R. 2025. Physiology, menstrual cycle. StatPearls Publishing.

Wartena R, Matjila M. 2023. Polycystic ovary syndrome and recurrent pregnancy loss: A review of the literature. Frontiers in Endocrinology **14**, 1183060.