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RESEARCH ARTICLE

Awareness of Polycystic Ovarian Syndrome (PCOS) in young adult female university students from Lahore Pakistan

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Abstract

Polycystic ovary syndrome (PCOS) is a prevalent endocrine disorder among women of reproductive age, associated with menstrual irregularities, infertility, and long-term metabolic risks. Despite its common occurrence, awareness and understanding of PCOS remain inadequate among young women. This study aimed to assess the level of awareness, common misconceptions, and sources of information about PCOS among young adult female university students. A descriptive cross-sectional study was conducted at Superior University, Lahore, Pakistan. One hundred female students aged 18–25 years were recruited through non-probability consecutive sampling after obtaining informed consent. Participants with a current or past diagnosis of PCOS were excluded. Data on demographics, knowledge and perceptions of PCOS were collected using a structured self-administered questionnaire and analyzed using SPSS version 23. Descriptive statistics were used to summarize the findings. All participants (100%) had heard of PCOS. Knowledge accuracy was limited: 71% recognized irregular menstrual cycles as a common symptom, only 47% correctly identified PCOS as a hormonal disorder, and 38% considered it treatable. Emotional and perception responses were predominantly worry (67%) and fear (24%), with 57% associating PCOS with infertility. The majority perceived lifestyle modification (54%) as the preferred treatment. Main sources of awareness were educational settings (46%) and TV/social media (30%). Notably, just over half (52%) indicated they would seek medical consultation, highlighting a key behavioral implication for campus health education. While awareness of PCOS was high, misconceptions about its hormonal basis and management persist, and emotional responses indicate considerable concern among students. Targeted health education programs are needed to improve knowledge, address misconceptions, and promote timely help-seeking behaviors in university settings.

Keywords: Polycystic Ovarian Syndrome, Young adult, University students, Female, Awareness, Perception, Pakistan.

INTRODUCTION

A frequent endocrine disorder, Polycystic Ovarian Syndrome (PCOS) typically affects young women of child bearing age, estimated to be seen in 10% of female poluation worldwide (Abu-Taha et al., 2020). It is characterized by menstrual irregularities, hyperandrogenism and polycystic ovaries on ultrasound (Abu-Taha et al., 2020; Yang et al., 2025) . Interplay of genetic and environmental factors are thought to play role in etiology of PCOS. In addition to family history and genetic predisposition, various environmental factors including high-fat high-sugar diet consumption, obesity, endocrine-disturbing chemical exposure, stress, chronic inflammation, sedentary lifestyle and insulin resistance contribute to PCOS development (Al Souheil & Chahine, 2022; Thomas & Kudesia, 2025). Important consequences of PCOS include infertility, depression, anxiety and risk of developing diabetes, dyslipidemia, atherosclerosis and cardiovascular disease later in life (Arain, Arif, & Halepota, 2015). Prevalence of PCOS had been reported to be up to 30% among women of reproductive age in Pakistani population, being more common in rural areas (Haq et al., 2017; Jabeen et al., 2022). A recent survey from Pakistan revealed that 72.5% of female university students were initially unaware of PCOS, but 90.2% showed adequate knowledge after an educational intervention. Additionally,

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17.5% were suspected of having PCOS, 3.5% were diagnosed based on symptoms and 5.5% had previously been diagnosed with 7.8% being overweight and 2.9% obese (Jena, Mishra, Naik, & Khan, 2020).

PCOS is a common endocrine disorder affecting a significant portion of reproductive-aged women, with potential long-term health implications such as infertility, metabolic disorders, and increased risk for cardiovascular diseases (Nisa et al., 2025; Tabassum et al., 2013). Despite its prevalence, awareness and understanding of PCOS remain low, particularly in young women. Early diagnosis and intervention can help manage the symptoms, reduce associated risks, and improve overall health outcomes. Therefore, assessing the awareness of PCOS among individuals is crucial for identifying knowledge gaps and informing effective public health strategies. Although PCOS has been widely studied as a clinical and public health concern, existing literature from Pakistan has primarily focused on prevalence, clinical presentation or metabolic outcomes, with limited attention to psychosocial dimensions such as awareness, misconceptions, emotional responses and help-seeking behaviors particularly among young women in university settings. Moreover, while studies from other South Asian contexts (e.g., India) have explored knowledge and attitudes toward PCOS among students, these findings cannot be assumed to be representative of Pakistani populations due to differences in sociocultural norms, health literacy, stigma surrounding reproductive health and access to healthcare services. Within Pakistan, evidence specific to female university students, especially across multiple campuses in Lahore, remains sparse and fragmented. Lahore represents a critical urban academic hub with a diverse female student population drawn from varied socioeconomic, cultural and geographic backgrounds. Despite this, there is limited empirical evidence examining how female university students in Lahore understand PCOS, what misconceptions persist, how they emotionally respond to learning about the condition and how these factors influence their intentions to seek medical advice or adopt management strategies. This lack of context-specific evidence constitutes an important research gap, as university years often coincide with the onset or recognition of PCOS symptoms and represent a formative period for health-related beliefs and behaviors.

Focusing on female university students is therefore theoretically and practically justified. Late adolescence and early adulthood are critical periods for the manifestation of PCOS symptoms, including menstrual irregularities, weight changes and hyperandrogenic features. During this stage, young women begin making independent health decisions, yet stigma surrounding reproductive and menstrual health may discourage open discussion and timely help-seeking. University environments therefore serve as both a risk context where stress, sedentary lifestyles and dietary changes may exacerbate symptoms, and an opportunity for early intervention through structured health education. Understanding how students perceive PCOS during this transitional life stage is essential for informing theory-driven and contextually relevant health promotion strategies.

This study is guided by a health literacy–informed Knowledge–Attitude–Practice (KAP) framework, conceptualized as a pathway in which sources of information (e.g., family, peers, social media, academic instruction, healthcare professionals) influence knowledge levels about PCOS. Knowledge, in turn, shapes perceptions and emotional responses including perceived severity, stigma, fear or reassurance which subsequently affect intentions and help-seeking behaviors, such as willingness to consult healthcare providers, seek diagnosis or adopt lifestyle and treatment measures. By situating all measured variables within this single conceptual model, the study ensures coherence between theoretical grounding, data collection and interpretation. By addressing these issues, this study contributes scientifically by extending PCOS research beyond prevalence and clinical profiles to include psychosocial and behavioral dimensions within a defined urban Pakistani university context. Practically, the findings provide an evidence base for the development of targeted, campus-based reproductive health education and awareness programs aimed at early recognition, stigma reduction, and informed help-seeking among young women. Such interventions may play a crucial role in improving long-term reproductive and metabolic health outcomes for women at a critical life stage.

METHODS

Study Design and Duration

The objective of this descriptive cross-sectional questionnaire-based study was to assess the knowledge and perception of polycystic ovary syndrome (PCOS) among young adult female university students. The study was carried out from March to May 2024. This study was conducted and reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for cross-sectional studies with explicit reporting of sampling procedures, variable operationalization, bias, and analytical methods.

Study Setting and Population

The study setting was Superior University, Lahore which is an urban, private-sector institution enrolling students from diverse socioeconomic and geographic backgrounds. The target population comprised young adult female university students aged 18–25 years enrolled in graduate-level academic programs.

Sampling Technique and Recruitment Procedure

A non-probability consecutive sampling technique was employed. Recruitment was conducted on weekdays during regular academic hours (08:00–16:00) in classrooms, libraries and common student areas across multiple departments. Female students meeting the eligibility criteria were approached consecutively and invited to participate until the target sample size was achieved. To minimize recruitment bias, data collection was carried out across different days, academic programs and locations, and participation was solicited without reference to prior awareness or interest in PCOS. Participation was voluntary and no incentives were provided.

Inclusion and Exclusion Criteria

Eligible participants were female students aged 18–25 years who consented to participate. Students with a self-reported current or previous medical diagnosis of PCOS were excluded. This exclusion was applied to ensure that measured knowledge, perceptions and emotional responses reflected baseline awareness rather than experiences shaped by clinical diagnosis or treatment.

While this criterion reduces information bias related to lived clinical experience, it also limits generalizability to women already diagnosed with PCOS, a limitation acknowledged in the interpretation of findings.

Sample Size

A total of 100 participants were included. The sample size was determined based on feasibility, time constraints and accessibility within the university setting. As this was an exploratory study, no formal power calculation was conducted. Nevertheless, the sample size was considered sufficient for estimating descriptive indices and conducting preliminary bivariate analyses. Future studies with larger, randomly selected samples are recommended to allow multivariable modeling and broader generalization.

Data Collection Tool

Data were collected using a structured self-administered questionnaire designed to assess participants' demographic characteristics, knowledge, and perceptions regarding PCOS. The questionnaire was designed in alignment with a health literacy–informed Knowledge–Attitude–Practice (KAP) conceptual framework. The questionnaire comprised three main sections: demographics (age, educational status, and socioeconomic background), knowledge of PCOS (symptoms, causes, complications, and treatment options), and perceptions toward PCOS and women's health. The instrument was developed after reviewing relevant literature and existing PCOS awareness questionnaires. Two subject experts reviewed the questionnaire for content validity, evaluating item relevance, clarity, cultural appropriateness and alignment with study objectives. It was then pilot-tested on 10 students to assess clarity and comprehensibility. Based on feedback, minor wording revisions were made, overlapping items were merged and ambiguous wording was clarified; and the final version was administered in English. All questionnaire items were single-response (forced choice) items. For knowledge and misconception questions, respondents were required to select one option; a "don't know" option was not included, which may have contributed to guessing and should be considered when interpreting extreme misconceptions.

Data Collection Procedure

Participants were approached in classrooms and common areas. The purpose, benefits, and procedures of the study were clearly explained before obtaining written informed consent. Each participant completed the questionnaire individually in a supervised environment to ensure understanding and to minimize external influence.

Data Analysis:

Data were entered and analyzed using SPSS version 23. Descriptive statistics, including mean, standard deviation, frequencies, and percentages, were used to summarize demographic variables and questionnaire responses. Inferential bivariate analyses were not performed due to the exploratory nature of the study and relatively small sample size. Future research may consider regression analyses to explore relationships between demographic characteristics and PCOS awareness.

Data Reliability and Limitations:

As the study utilized self-reported data, there is a possibility of response or misclassification bias resulting from misunderstanding or recall errors. Efforts were made to minimize these limitations through pilot testing, careful wording of questions, and providing assistance during questionnaire completion. To ensure transparency and reproducibility, comprehensive details regarding the development, structure, and validation of the questionnaire have been provided. The questionnaire can be made available upon reasonable request from the corresponding author for academic and research purposes.

Ethical Considerations

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki (1964), revised in 2000. All participants were informed about the purpose, benefits and procedures of the study prior to participation. They were assured of the protection of their life, health, privacy, and dignity, and confidentiality and anonymity of their data were maintained throughout the research process. Participation was entirely voluntary, and students were free to withdraw at any point without any repercussions.

RESULTS OF STUDY

Participant Characteristics:

A total of 100 female university students completed the questionnaire. More than half of the respondents were aged ≤21 years (55, 55.0%), while 45 (45.0%) were aged ≥22 years. Participants were enrolled across multiple academic programs and semesters, reflecting a heterogeneous student population. The majority reported a middle socioeconomic background, with smaller proportions reporting low or high socioeconomic status.

Awareness of PCOS:

General awareness of PCOS was high in terms of name recognition (100, 100%), as all respondents reported having heard of the PCOS as a health condition affecting young women (100, 100%). However, awareness did not consistently translate into accurate understanding, as reflected in subsequent knowledge and misconception domains. The participants' demographic and academic characteristics provide important context for interpreting awareness levels and limit generalizability primarily to urban university students.

Knowledge of PCOS:

Knowledge-related responses are summarized in Table 1. Most participants (71.0%) correctly identified irregular menstrual cycles as a common clinical feature of PCOS. Awareness of lifestyle-related risk modification was also moderate, with 67.0% believing that healthy diet and exercise can reduce PCOS risk. However, core biomedical knowledge was limited. Less than half of respondents (47.0%) correctly identified PCOS as a hormonal disorder. Recognition of long-term metabolic and cardiovascular consequences was particularly low, with only 2.0% identifying diabetes mellitus and 4.0% identifying heart disease as possible outcomes. These indicate partial but incomplete understanding among the majority of

participants. Misconceptions were common. A substantial proportion of respondents incorrectly identified PCOS as a type of cancer (28.0%) or diabetes (25.0%) as depicted in Table 1. These misconceptions reflect confusion between PCOS and other chronic conditions and may be influenced by the absence of a "don't know" response option.

Table 1. Knowledge of PCOS

Questions	Response	Frequency
What is PCOS?	A type of cancer	28 (28.0%)
	A hormonal disorder	47 (47.0%)
	A type of diabetes	25 (25.0%)
What are the common clinical features of PCOS?	Irregular menstrual cycles	71 (71.0%)
	Weight gain	14 (14.0%)
	Acne	03 (3.0%)
	Excess facial hair growth	12 (12.0%)
Can healthy diet & exercise reduce PCOS risk?	Yes	67 (67.0%)
	No	33 (33.0%)
What can be the consequences of PCOS?	Diabetes Mellitus	02 (2.0%)
	Heart disease	04 (4.0%)
	Infertility	57 (57.0%)
	All of these	37 (37.0%)

Perceptions and Emotional Responses:

Negative emotional reactions to a hypothetical PCOS diagnosis were prevalent as depicted in Table 2. The majority of participants reported feeling worried (67, 67.0%) or scared (24, 24.0%), while fewer reported feeling confused (4, 4.0%) or sad (5, 5.0%). Despite moderate awareness of lifestyle modification, only 38 (38.0%) of respondents believed that PCOS is a treatable condition.

Table 2. Emotional responses about PCOS

Questions	Response	Frequency
How would one feel if she suffered from PCOS?	Worried	67 (67.0%)
	Scared	24 (24.0%)
	Confused	04 (4.0%)
	Sad	05 (5.0%)

Treatment and Help-Seeking Intentions:

Just over half of the participants (52, 52.0%) reported that medical advice should be sought for PCOS while only 38 (38.0%) thought PCOS can be treated as demonstrated in Table 3. Regarding treatment options, the majority (54, 54.0%), considered lifestyle changes as the preferred modality of treatment, whereas 31 (31.0%) reported medications.

Table 3. Treatment and Help-Seeking Intentions about PCOS

Questions	Response	Frequency
Do you think PCOS can be treated?	Yes	38 (38.0%)
	No	62 (62.0%)
Should one seek medical advice for PCOS?	Yes	52 (52.0%)
	No	48 (48.0%)
What are the treatment options for PCOS?	Medication	31 (31.0%)
	Lifestyle changes	54 (54.0%)
	Surgery	09 (9.0%)
	Home remedies	06 (6.0%)

Sources of Information:

Sources of PCOS awareness are summarized in Table 2. Educational sources (46, 46.0%) were the most frequently reported, followed by TV/social media (30, 30.0%), family (14, 14.0%), and friends (10, 10.0%).

Table 4: Source of PCOS information

Questions	Response	Frequency
Source of PCOS information	TV/Social media	30 (30.0%)
	Educational source	46 (46.0%)
	Family	14 (14.0%)
	Friends	10 (10.0%)

DISCUSSION

The present study assessed the level of awareness, perceptions, and emotional responses regarding polycystic ovary syndrome (PCOS) among young adult female university students. The findings revealed that although all participants had heard of PCOS, significant misconceptions persisted regarding its nature, causes, and treatment. A central finding of this study is the apparent paradox of universal awareness of PCOS alongside substantial misconceptions regarding its etiology, treatability, and long-term consequences. Although all participants had heard of PCOS, fewer than half correctly identified it as a hormonal disorder, and a considerable proportion misclassified it as cancer or diabetes. This pattern suggests that awareness in this context reflects exposure to the term rather than functional or biomedical understanding. Similar gaps between recognition and accurate knowledge have been reported in studies from other settings; however, direct comparisons should be interpreted cautiously due to contextual and cultural differences.

While 71% correctly identified irregular menstrual cycles as a common clinical feature, only 47% recognized PCOS as a hormonal disorder in the present study. More than half believed that PCOS could not be treated, and just over half considered medical consultation necessary.

Lifestyle modification was the most frequently cited treatment approach, and emotional responses to the disorder were largely negative, with worry and fear being predominant. Educational sources and social media were identified as the main channels of information. Jena et al. (2020) demonstrated poor awareness regarding PCOS in adolescent and young adult females in Eastern India, with only 2.7% having heard about PCOS. The present study revealed various insights into the awareness and perceptions of PCOS among participants. Although all the participants had heard about PCOS, when asked about its nature, 47% identified it as a hormonal disorder, while 28% mistakenly believed it to be a type of cancer, and 25% thought it was a type of diabetes. Regarding common clinical features, 71% correctly recognized irregular menstrual cycles as a key symptom, while others identified weight gain (14%), excess facial hair growth (12%), and acne (3%). Abu-Taha et al. (2020) reported that although 90.3% of females knew menstrual irregularities to be associated with PCOS, the majority had inadequate overall knowledge regarding the condition. Muhaidat et al. (2023) demonstrated that 60.8% of participants were unaware that individuals with PCOS had multiple ovarian cysts.

When it came to treatment, 62% of participants believed PCOS cannot be treated, while 38% thought otherwise. Regarding medical advice, 52% felt it was necessary to seek consultation for PCOS, while 48% disagreed. Treatment preferences showed that 54% favored lifestyle changes, 31% considered medication, 9% thought surgery was an option, and 6% suggested home remedies. In terms of prevention, 67% believed that a healthy diet and exercise could reduce the risk of PCOS. Muhaidat et al. (2023) demonstrated that 74.1% of participants recognized that losing weight and 69.3% understood that exercising could reduce PCOS symptoms, while 27.5% were unaware of the benefits of eating protein-rich food and only 6.1% knew that consuming fat-rich food could help alleviate symptoms. In the study by Jena et al. (2020), 70% were aware that diet restrictions and exercise were the primary treatment modalities for PCOS, while only 3.7% knew about the role of contraceptive pills in managing the condition. In the present study, the consequences of PCOS were mainly associated with infertility (57%) and broader risks such as diabetes and heart disease (37%). Muhaidat et al. (2023) demonstrated that although 65% of participants identified infertility as a consequence of PCOS, awareness of non-reproductive complications such as hypertension, diabetes, and heart disease was generally low. Al Souheil et al. (2022) showed that 51.3% of women were aware that PCOS may result in infertility. As for sources of awareness, 46% cited educational sources, 30% mentioned TV or social media, while 14% and 10% referenced family and friends, respectively. Jena et al. reported the main sources of information as doctors (40.7%), followed by friends and the internet (25.9%). In the study by Jabeen et al. (2022), PCOS knowledge primarily came from teachers (37%), followed by doctors (31.5%), the internet (11%), and friends (7.5%), with the most significant factor contributing to low awareness being the lack of information and publicity (63%).

Emotionally, most participants in the present study felt worried (67%) or scared (24%) about suffering from PCOS. Abu-Taha et al. found that 55.9% of females associated PCOS with low body image (Nisa et al., 2025). Similarly, Al Souheil et al. (2022) showed that almost two-thirds of participants believed that PCOS patients have low body image and require social support. Young adult females, especially students, who lack sufficient knowledge about PCOS often experience feelings of shame, guilt, and trauma when first encountering the condition. This lack of awareness can lead to emotional distress and confusion, underscoring the need for comprehensive education and psychosocial support to address both the physical and emotional dimensions of PCOS. Potential barriers to help-seeking in this population likely include stigma surrounding menstrual and reproductive health, perceived normalization of symptoms, limited access to youth-friendly gynecological services, financial constraints and sociocultural norms discouraging open discussion of women's health issues**.** While these factors were not directly measured in this study, they offer a plausible explanation for the observed gap between awareness and intention to seek care and warrant further investigation.

The present study has several limitations and our findings should be interpreted in light of these limitations. First, the study was conducted at a single university using non-probability consecutive sampling; therefore, the results cannot be generalized to all female university students in Lahore or Pakistan. Second, the use of a forced-choice questionnaire without a "don't know" option may have contributed to guessing and overestimation of misconceptions, representing a potential measurement bias. Third, data were self-reported and collected in a supervised setting, which may have introduced social desirability bias. Furthermore, cultural and institutional differences may have influenced participants' perceptions and awareness levels. The exploratory design and modest sample size limited the ability to perform bivariate analysis and multivariable modeling. These limitations underscore the need for larger, multi-institutional studies using probabilistic sampling, more extensively validated instruments, and longitudinal or interventional designs to better understand causal pathways and behavioral outcomes.

These findings hold practical significance by identifying areas of poor awareness and emotional concern, thereby informing the development of targeted educational interventions. While overall awareness of PCOS among university students is relatively high, significant gaps persist in understanding its hormonal basis, treatment options, and long-term consequences. Addressing these gaps through structured health education programs, awareness campaigns, and collaboration between healthcare professionals and educational institutions could foster accurate knowledge, reduce anxiety, and promote early diagnosis and management. Raising awareness about PCOS risks, treatment options, and lifestyle modifications will empower young women to take proactive steps toward maintaining their reproductive and metabolic health. Despite its limitations, the study emphasizes the urgent need to improve PCOS-related knowledge and awareness among university students and the wider young female population. Promoting evidence-based education through credible academic and health platforms can help dispel misconceptions and encourage timely medical consultation. Structured clinical education seminars led by gynecologists or endocrinologists, focusing on the hormonal basis, treatability, and long-term implications of PCOS. Curated digital education materials (e.g., short videos, infographics, and evidence-based social media content) disseminated through official university platforms to counter misinformation. Integration of PCOS education into student wellness programs, emphasizing both physical and emotional health dimensions. Clear referral pathways to campus or affiliated health services, enabling students to seek confidential consultation and counseling when symptoms arise.

CONCLUSION

In this study, awareness of PCOS was high among female university students, but substantial gaps remained in understanding its hormonal basis, treatment options and the importance of seeking timely medical consultation. Although a majority recognized irregular menstrual cycles as a common clinical feature, fewer participants were aware of the disorder's treatment options or the fact that it can be treated. Emotional responses to PCOS were largely centered on feelings of worry and fear, suggesting a need for better emotional support and education. Based on these findings, three key education priorities are clarifying the definition and hormonal nature of PCOS, emphasizing that PCOS is manageable through lifestyle changes and medical interventions, and informing students when and how to seek professional consultation. To address these priorities, campus-based interventions such as education seminars, curated digital educational materials and referral pathways to university health services may be effective in improving knowledge and promoting proactive health behaviors. Future research should build on this exploratory work by conducting multi-site studies with larger and more diverse student populations, employing validated instruments for knowledge and perception assessment, and evaluating the effectiveness of targeted educational interventions in improving awareness, correcting misconceptions, and facilitating timely help-seeking. These steps can provide a stronger evidence base for scaling campus-level reproductive health programs tailored to young women.

DECLARATION

Ethical Considerations

The present descriptive questionnaire-based study was conducted in accordance to the ethical standards laid down in the 1964 Declaration of Helsinki, revised in the year 2000. All the subjects were explained the purpose, benefits and process of the study after which written informed consent was obtained prior to data collection, with assurance to maintain anonymity and confidentiality.

Consent for publication

Note Applicable.

Funding

Note Applicable.

Availability of data and materials

Data generated or analysed during this study are available from the corresponding author upon reasonable request.

Competing interests

Note Applicable.

Authors' Contributions

This study was conceived and designed by MWR, SA, BW and NIB. MWR, MSA, MSAG and SA did the initial literature research. MWR, MSA, BW and SA did the data collection, assembly and patient assessment. Data analysis and interpretation were done by NIB, BW and MSA. MWR, MSAG and SA were involved in manuscript writing. NIB, BW and MSA did the final critical review and corrections.

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ADDITIONAL INFORMATION

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