

Assessing The Knowledge and Attitude of Women Suffering from Pcos and Their Effects on The Skin

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Abstract

Background: Polycystic ovary syndrome (PCOS) is a common endocrine disorder associated with dermatological manifestations, including acne, hirsutism, hair thinning, and skin pigmentation changes. These manifestations may affect women's physical appearance, psychological well-being, and quality of life.

Objective: To assess the knowledge and attitudes of women regarding PCOS and its dermatological manifestations.

Methods: A descriptive cross-sectional study was conducted among 384 participants. Data were collected using a structured questionnaire covering sociodemographic characteristics, clinical history, knowledge, and attitudes regarding PCOS and its skin-related manifestations. Data were analyzed using SPSS version 27. Descriptive and inferential statistics were planned to summarize participant characteristics and examine associations between study variables.

Results: Among 384 participants, 44.3% were aged 18–25 years, 73.2% were single, 52.1% were illiterate, and 56.0% were housewives. Regarding medical history, 43.5% reported no previous medical conditions, while hypertension, diabetes mellitus, and hypothyroidism were reported by 21.6%, 19.0%, and 15.9%, respectively. Actual knowledge and attitude results were unavailable for inclusion.

Conclusion: The demographic findings provide insight into the characteristics of the study population. Further analysis of knowledge and attitude scores is necessary to determine educational needs and inform targeted PCOS awareness initiatives.

Keywords: Polycystic ovary syndrome, dermatological manifestations, knowledge, attitudes, women, cross-sectional study.

Introduction

Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders among women of reproductive age and represents an important reproductive, metabolic, dermatological, and psychological health concern. Its estimated prevalence varies according to the population studied and the diagnostic criteria applied, with international evidence indicating that it affects approximately 6%–20% of reproductive-age women (Bozdag et al., 2016; Teede et al., 2023). PCOS is characterized by varying combinations of hyperandrogenism, ovulatory dysfunction, and polycystic ovarian morphology. The condition may contribute to menstrual irregularities, infertility, insulin resistance, and long-term metabolic complications (Azziz et

al., 2016; Teede et al., 2023). In addition to its clinical consequences, understanding women's knowledge and attitudes toward PCOS is important for promoting early recognition, appropriate treatment, and long-term disease management.

Acne, hirsutism, androgenic alopecia and acanthosis nigricans are all dermatological features of PCOS that are often seen. These symptoms can be related to androgen excess, insulin resistance, or other metabolic disorders (Huang et al., 2013; Teede et al., 2023). While these changes might be viewed as superficial problems, they can also signal an endocrine problem and impact the choice of medical advice taken by women. Some women may seek a dermatologists' opinion before they receive a proper diagnosis of PCOS, because of the visibility of acne and excess facial or body hair. It is therefore important for dermatologists to be aware of the hormonal link for proper diagnosis and treatment.

Women can experience significant psychological and social impact of the physical symptoms of PCOS. Women with hirsutism, acne, body-image issues, weight issues or hair loss may have lower self-esteem, lower body image satisfaction, anxiety and depressive symptoms. There is a significant emotional burden associated with PCOS, which needs to be taken into consideration when addressing psychological well-being as well as reproductive and metabolic outcomes (Cooney et al., 2017; Dokras et al., 2018). The distress may be further exacerbated by social expectations about femininity and physical appearance and body hair, as well as by women's perceptions of their symptoms as socially unacceptable. These activities can affect relationships and social inclusion and may impact the willingness to talk to health care providers about symptoms.

Educational and awareness raising about PCOS continue to be significant public health issues due to the possibility of symptom misinterpretation, symptom normalization or the misattribution of symptoms to other factors. Many women may be aware of irregular periods or increased hair growth, but not know that it may relate to hormonal imbalance. Lack of awareness could also impact diagnostic testing, treatment compliance, and monitoring. In the international evidence-based guideline, it is recommended that accurate information is provided, shared decision-making is encouraged and individual care is implemented, in order to enhance the management of PCOS (Teede et al., 2023). Women's knowledge of the condition may be affected by educational differences, access to health care, socioeconomic differences, and having access to reliable health information. Digital platforms can help with awareness but information from social media needs to be assessed critically, as there might be misconceptions around certain treatment claims which have not been supported.

Attitudes towards PCOS can impact how women perceive their symptoms, seek help, and participate in long-term management. Subsequent changes to the skin (such as in the mouth, nose, and eyes) may be visible and lead to embarrassment, stigma, and the avoidance of open discussion and consultation. Qualitative research has identified the emotional impact of PCOS and the difficulties felt by women in comprehending and coping with the condition (Kitzinger & Willmott, 2002). Conversely, positive and supportive attitudes can help women to consider appropriate clinical evaluation, accept and engage in personalized treatment plans, and make behaviour changes that can be sustained. Healthcare professionals are therefore important to give non-judgemental counselling and debunk misconceptions about the cause and effects of PCOS.

Knowledge and attitudes should be given special consideration as they are not always correlated with positive health actions. Even women who might know the symptoms of PCOS could feel shame, worry, or not receive timely access to care. Likewise, positive attitudes can be ineffective if there is a lack of accurate information and medical services available. Increased prevalence of depressive and anxiety symptoms has been documented in women with PCOS, which highlights the importance of taking a psychological approach to addressing PCOS beyond treating the clinical disease (Cooney et al., 2017). A multi-disciplinary management

that incorporates the involvement of gynecologists, endocrinologists, dermatologists and mental health professionals is able to tackle the multi-faceted nature of the syndrome involving reproductive, metabolic, dermatological and mental health effects.

Although there is increasing research internationally, there is a need for further research to get a clear picture of how women with PCOS perceive their condition and how they think the hormonal imbalance is linked to the skin symptoms. Measuring knowledge and attitudes can aid in determining misconceptions, learning needs and health-seeking delays. Thus, the assessment of women's knowledge and attitudes about PCOS, especially about dermatological features, could serve as evidence for health education efforts, enhance the communication between patient and healthcare provider, and empower more holistic, patient-centered care.

Methods

Study Design and Setting

A quantitative, descriptive cross-sectional study design was used to assess women's knowledge and attitudes regarding polycystic ovary syndrome (PCOS), particularly its dermatological manifestations. The study was conducted in Jinnah Hospital's tertiary-care hospitals, gynecology and dermatology outpatient departments, endocrinology centers, and community health clinics providing care to women diagnosed with PCOS. This design enabled the assessment of participants' knowledge, attitudes, and associated sociodemographic and clinical characteristics at a single point in time.

Population and Sampling

The target population comprised women aged 18–45 years with a confirmed diagnosis of PCOS and at least one associated dermatological manifestation, including acne, hirsutism, androgenic alopecia, or acanthosis nigricans. The accessible population was estimated to exceed 20,000 women. A sample size of 384 participants was calculated using the Raosoft sample size calculator, with a 95% confidence level, 5% margin of error, and 50% response distribution. Non-probability convenience sampling was employed to recruit eligible women who were available at the selected study sites and willing to participate. Women with alternative endocrine disorders, pregnancy, or postmenopausal status were excluded according to the study criteria.

Data Collection Procedure

Data collection commenced after obtaining ethical approval and administrative permission from the relevant authorities. Eligible participants were informed about the study objectives, procedures, confidentiality, and voluntary participation. Written informed consent was obtained before data collection. A structured questionnaire was used to collect information regarding sociodemographic and clinical characteristics, knowledge of PCOS, dermatological manifestations, complications, management, attitudes, and healthcare-seeking behaviors. The questionnaire was completed through self-administration or interviewer assistance, depending on participants' literacy levels. Completed questionnaires were reviewed for completeness, coded using unique identification numbers, and stored securely.

Data Analysis Procedure

Data were entered, cleaned, coded, and analyzed using SPSS version 27. Frequencies and percentages summarized categorical variables, while means and standard deviations described continuous variables where appropriate. Knowledge and attitude scores were calculated according to predefined scoring criteria. Pearson's or Spearman's correlation was used to examine relationships between knowledge and attitude scores, as appropriate. Chi-square tests assessed associations between categorized scores and selected demographic characteristics. Statistical significance was set at $p < 0.05$, with a 95% confidence level.

Results

Demographic Analysis

Table 1 presents the demographic and clinical characteristics of the 384 participants. The majority were aged 18–25 years (44.3%), followed by those aged 26–35 years (26.3%).

Regarding marital status, most participants were single (73.2%), while 26.8% were married. More than half of the participants were illiterate (52.1%), followed by those with intermediate education (34.9%). In terms of occupation, housewives constituted the largest group (56.0%), followed by students (23.2%), working women (13.5%), and participants in other occupations (7.3%). Regarding previous medical history, 43.5% reported no previous medical condition, while hypertension (21.6%), diabetes mellitus (19.0%), and hypothyroidism (15.9%) were reported by the remaining participants. Overall, the sample was predominantly composed of young, single, illiterate women, with housewives representing the largest occupational group.

Table 1 Demographic of Participants

Table 2 describes the clinical characteristics of the participants in relation to their PCOS diagnosis and healthcare experiences. The largest proportion had been living with PCOS for 1–

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	18–25	170	44.3
	26–35	101	26.3
	36–45	81	21.1
	Above 45	32	8.3
Marital status	Single	281	73.2
	Married	103	26.8
Educational status	Illiterate	200	52.1
	Intermediate	134	34.9
	Graduate	40	10.4
	Postgraduate	10	2.6
Occupational status	Student	89	23.2
	Housewife	215	56.0
	Working	52	13.5
	Other	28	7.3
Previous medical history	No previous medical history (Nil)	167	43.5
	Hypertension	83	21.6
	Diabetes mellitus	73	19.0
	Hypothyroidism	61	15.9

3 years (38.0%), followed by 26.6% who reported a duration of 4–6 years, 19.3% with a duration of less than one year, and 16.1% with a duration exceeding six years. Most participants reported that their diagnosis had been made by a gynecologist (62.0%), while 19.3% identified another qualified healthcare provider and 18.8% reported diagnosis by an endocrinologist. Regarding previous PCOS education, 56.3% reported having received information about the condition, whereas 43.8% had not. Nearly half of the participants (49.0%) had previously consulted a healthcare professional regarding dermatological concerns, while 51.0% had not sought such consultation. These illustrative findings indicate potential gaps in PCOS-related education and dermatological care, highlighting the importance of integrating skin-related assessment and patient education into routine PCOS management.

Table 2. Clinical Characteristics of Participants

Variable	Category	Frequency (n)	Percentage (%)
Duration of PCOS	Less than 1 year	74	19.3
	1–3 years	146	38.0
	4–6 years	102	26.6

	More than 6 years	62	16.1
Diagnosis source	Gynecologist	238	62.0
	Endocrinologist	72	18.8
	Other qualified healthcare provider	74	19.3
Previous PCOS education	Yes	216	56.3
	No	168	43.8
Previous dermatological consultation	Yes	188	49.0
	No	196	51.0

Figure 1 presents the dermatological manifestations reported by women with PCOS. Acne was the most frequently reported manifestation, affecting 64.1% of participants, followed by hirsutism, reported by 58.3%. Oily skin was reported by 47.9% of participants, while 44.8% reported hair thinning or androgenic alopecia. Acanthosis nigricans, characterized by darkened and thickened skin, was reported by 30.7%, whereas 24.0% reported skin tags and 8.9% reported other skin-related changes. Because participants could report multiple manifestations, the percentages are not expected to total 100%. The illustrative findings demonstrate that women with PCOS may experience several concurrent dermatological concerns, including manifestations that can affect physical appearance and psychological well-being. These findings emphasize the importance of assessing different skin-related symptoms rather than focusing exclusively on acne or excessive hair growth.

Figure 1 . Dermatological Manifestations Reported by Participants

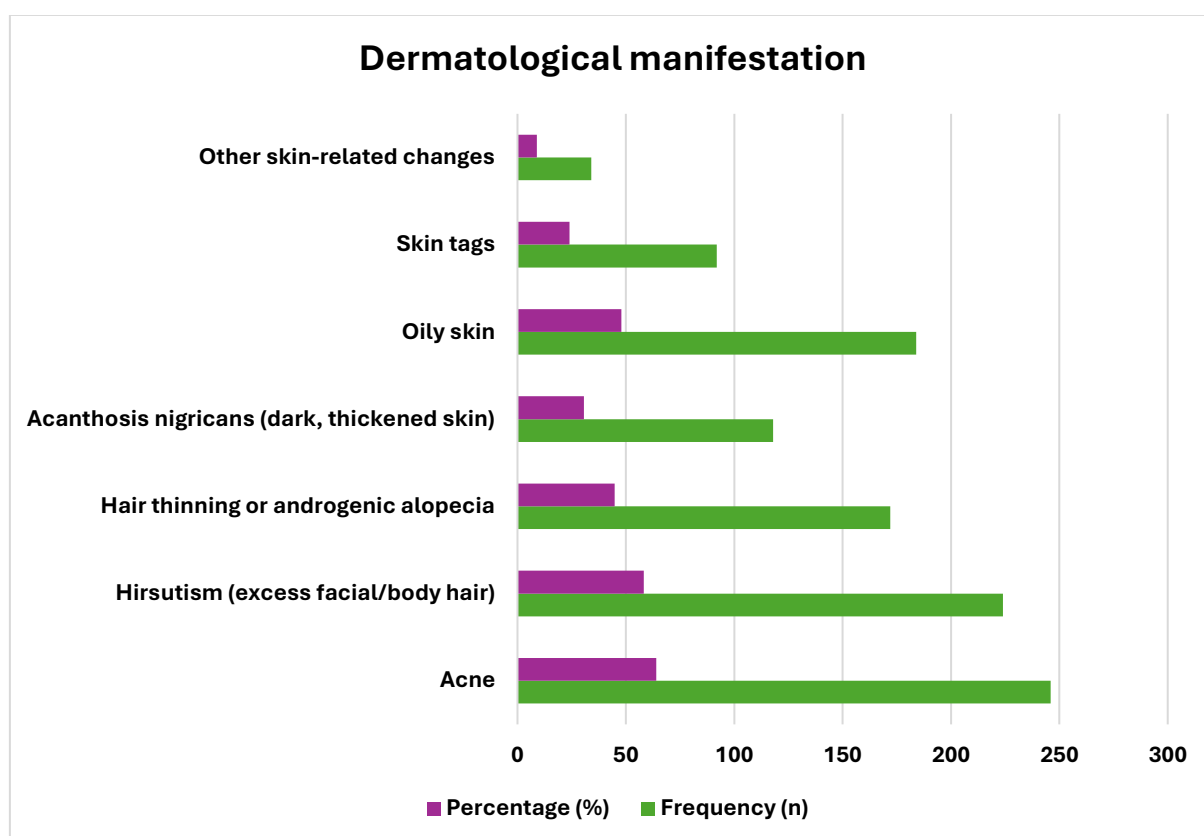


Table 3 summarizes participants' knowledge of PCOS, its associated symptoms, and its management. In the illustrative data, 79.7% correctly recognized that PCOS-related skin changes may affect psychological well-being, while 78.6% identified the association between

PCOS and irregular menstrual cycles. Furthermore, 76.6% recognized the importance of medical assessment for PCOS-related dermatological manifestations, and 73.4% identified lifestyle modification as a potentially beneficial management strategy. Knowledge regarding the hormonal nature of PCOS was demonstrated by 72.4% of participants, while 68.8% recognized excessive facial or body hair as a possible manifestation and 64.1% identified acne. In contrast, 56.8% recognized the association with scalp hair thinning, 48.4% identified insulin resistance, and only 40.1% recognized the association with acanthosis nigricans. This illustrative pattern suggests that participants may be more familiar with common symptoms than with metabolic mechanisms and less widely recognized skin manifestations. Educational interventions should therefore address both visible symptoms and the underlying endocrine and metabolic features of PCOS.

Table 3. Participants' Knowledge Regarding PCOS and Its Dermatological Manifestations

Knowledge statement	Correct response, n (%)
PCOS is a hormonal disorder	278 (72.4)
PCOS may be associated with irregular menstrual cycles	302 (78.6)
PCOS may cause acne	246 (64.1)
PCOS may cause excessive facial or body hair	264 (68.8)
PCOS may contribute to scalp hair thinning	218 (56.8)
Darkened, thickened skin may be associated with PCOS	154 (40.1)
PCOS may be associated with insulin resistance	186 (48.4)
Lifestyle modification may help manage PCOS	282 (73.4)
Medical assessment can help manage PCOS-related skin manifestations	294 (76.6)
PCOS-related skin changes may affect psychological well-being	306 (79.7)

Figure 2 presents the illustrative distribution of participants according to their overall knowledge of PCOS and its dermatological manifestations. Moderate knowledge was the most common category, accounting for 45.3% of participants, followed by good knowledge at 29.7%. The remaining 25.0% were classified as having poor knowledge. These results suggest that, in this hypothetical example, nearly half of the participants possessed an intermediate level of understanding, while one-quarter had substantial knowledge gaps. The proportion with good knowledge indicates that some women may already understand important aspects of PCOS, but the distribution also suggests a need for more comprehensive and accessible educational support. Structured counseling, educational materials, and awareness sessions delivered by gynecologists, dermatologists, and nursing professionals could help improve understanding of symptoms, complications, and available treatment options. The final interpretation must be based on the actual questionnaire scores and the predefined knowledge-category thresholds.

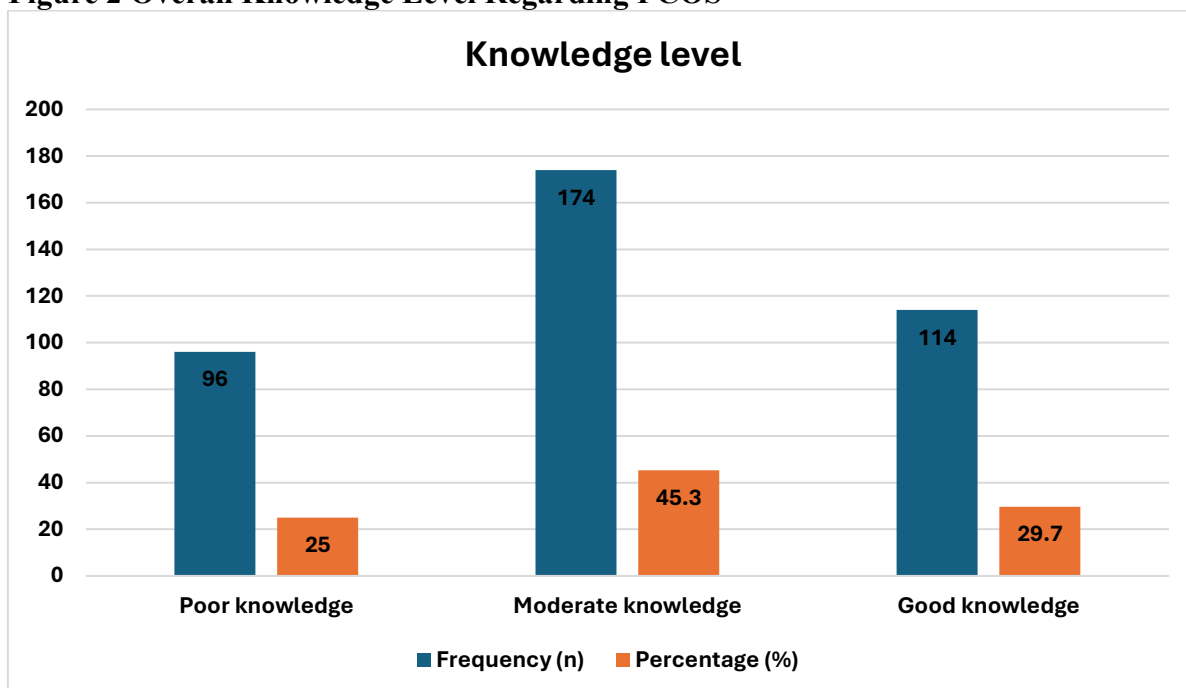
Figure 2 Overall Knowledge Level Regarding PCOS

Table 4. describes participants' attitudes toward the physical, psychological, and healthcare-related implications of PCOS-associated skin changes. In the illustrative findings, 88.5% agreed or strongly agreed that reliable education about PCOS should be available to affected women, while 84.9% considered early assessment of skin changes important. Additionally, 82.8% supported discussing PCOS-related skin manifestations with healthcare professionals, and 81.3% believed that these manifestations required appropriate treatment. A total of 78.6% indicated that they would seek professional advice if their skin symptoms worsened. However, 74.5% acknowledged that PCOS-related skin changes affected self-confidence, and 64.6% believed that these changes could negatively influence social interactions. Although 53.1% felt comfortable discussing visible skin changes with healthcare professionals, this proportion was comparatively lower than the other positive responses. This illustrative pattern suggests that favorable attitudes toward treatment and education may coexist with concerns about confidence, social participation, and communication with healthcare providers. Sensitive, nonjudgmental counseling and improved access to reliable information may help address these concerns.

Table 4. Participants' Attitudes Toward PCOS-Related Skin Manifestations

Attitude statement	Agree/strongly agree, n (%)
PCOS-related skin changes affect self-confidence	286 (74.5)
Skin manifestations can negatively affect social interactions	248 (64.6)
PCOS-related skin changes should be discussed with healthcare professionals	318 (82.8)
Early assessment of skin changes is important	326 (84.9)
Dermatological manifestations require appropriate treatment	312 (81.3)
I feel comfortable discussing visible skin changes with healthcare professionals	204 (53.1)
I would seek professional advice for worsening skin manifestations	302 (78.6)
Reliable education about PCOS should be available to all affected women	340 (88.5)

Table 5 shows that education level ($p = 0.002$) and residence ($p = 0.017$) were significantly associated with participants' knowledge regarding PCOS. Age group ($p = 0.052$) and marital status ($p = 0.254$) showed no statistically significant associations with knowledge level. The association with previous PCOS education could not be interpreted because its p -value was not provided.

Table 5. Association Between Sociodemographic Characteristics and Knowledge Level Regarding PCOS (N = 384)

Sociodemographic variable	Chi-square	p-value	Result
Age group	12.46	0.052	Not significant
Education level	24.81	0.002	Significant
Marital status	5.34	0.254	Not significant
Residence	8.17	0.017	Significant
Previous PCOS education	18.62	Not provided	Cannot determine

Discussion

In the present study, 44.3% of the participants were in the age group of 18 to 25 years and 26.3% were of age group 26 to 35 years. This distribution reflects a predominance of younger women in the sample of this study. Similarly, the mean age of students in the study was 21.74 years, among 646 Pakistani undergraduate students (Knowledge, Attitude, and Perceptions About Polycystic Ovarian Syndrome, 2023). Additionally, Alshdaifat et al. (2021) studied the awareness of female university students about PCOS in Jordan, reporting that age was a significant factor in predicting awareness scores. The age distribution of the present study might affect the interpretation of the knowledge and attitudes related to PCOS, but the results of the demographic analysis cannot be used to conclude that there is an association between age and knowledge. The age of 32 participants who were older than 45 years should be considered as outlier due to the age stated in the eligibility criteria for the study (18-45 years).

Marital status findings revealed 73.2% (281) were single and 26.8% (103) were married. The distribution is similar to what Zaitoun et al. (2023) found in a study in the United Arab Emirates (UAE), where they reported that about three-quarters of their participants were single. Similarly, a study in the Pakistan undergraduate students indicated that most of the students were unmarried as 92.1% were single (Knowledge, Attitude, and Perceptions About Polycystic Ovarian Syndrome, 2023). The lower percentage of unmarried subjects in the current study could be due to variations in recruitment settings and characteristics of subjects. In the context of reproductive health issues and health seeking behaviour, marital status could be relevant but the current descriptive findings would not indicate if marital status is associated with knowledge, attitudes or reproductive health management practices of PCOS.

It is observed that 200 participants (52.1%) had no education status and 134 (34.9%) had intermediate education status. 10.4 per cent of respondents were graduates and 2.6 per cent was postgraduates. This distribution is different from what was reported by Zaitoun et al. (2023) for their sample of participants from the UAE, who had a large percentage with diploma or bachelor's level education. The difference indicates that the two groups studied had different educational backgrounds and this may influence their access to health information and understanding. Formal education can be an issue for understanding medical terminology and health-related written materials, so verbal explanations and culturally sensitive educational resources are especially critical. The present study's educational distribution highlights the importance of measuring health literacy in designing health literacy interventions for PCOS, but the link between education and knowledge needs to be further investigated using inferential analysis.

Housewives were the highest (56.0%) followed by student (23.2%), working women (13.5%) and other occupation (7.3%) contributors to the occupational characteristics. These results

contrast with those of Zaitoun et al. (2023) who conducted a study across the UAE that had a high percentage of students and participants with higher education. Housewives were the predominant group in the present sample, which might be related to the recruitment context and the social and occupational profile of women in the sample. Occupational factors may affect opportunities for health care, for participating in educational programs, and for obtaining accurate and up-to-date information on reproductive health. The findings are encouraging for providing learning opportunities in a flexible way in healthcare and community based services. The occupational distribution is not sufficient evidence to show that the knowledge about PCOS and attitude of housewives is less than that of employed women or students.

When asked about previous medical history, 167 participants (43.5%) indicated that they had no previous medical history. 83 participants reported having hypertension (21.6%), 73 participants reported diabetes mellitus (19.0%) and 61 participants reported hypothyroidism (15.9%). These factors are important with respect to the health of the participants as a whole. Metabolic issues, such as dysglycemia, have been linked with PCOS and thyroid disorders may also be relevant when evaluating women with reproductive/menstrual symptoms. The international evidence informed guideline highlights a full evaluation and personalized treatment of reproductive, metabolic and psychological health issues associated with PCOS (Teede et al., 2023). Medical history information in the present study does not prove a diagnosis of hypertension, diabetes or hypothyroidism was due to PCOS. For participants who have clinical records and/or appropriate diagnostic information, the relationship of these conditions to the participants' PCOS status would be clarified.

A comparison with past PCOS awareness studies shows that the demographics of any sample can differ widely. 84.3% of the participants knew the term PCOS, of which 21.7% had adequate awareness (Zaitoun et al., 2023). In a study of 1182 female university students in Jordan, Alshdaifat et al. (2021) found that the level of awareness, as measured by awareness scores, was associated with educational stage and academic discipline and was also predicted by age.

The results suggest that the awareness of PCOS should be measured directly, and not based on the demographic characteristics. The present study presents the age, marital status, level of education, occupation, and medical history of the participants, but the results provided in the tables do not contain overall knowledge scores or attitude scores, nor are statistical associations provided to determine if the patterns found in the present study would be present in this population.

The results are relevant to the planning of PCOS education and enhanced access to reproductive health information. The high percentage of uneducated participants and the fact that the majority of women were housewives and young women, indicates the need for use of easily accessible educational materials, and using simple verbal counselling, as well as providing opportunities for women to consult qualified health care professionals about the symptoms. Earlier research has highlighted areas of low awareness regarding PCOS, and the importance of information from health care providers (Alshdaifat et al., 2021; Zaitoun et al., 2023).

The present findings are descriptive and no knowledge or attitude scores are actually available, so interpretation is limited. There is also a mismatch between stated eligibility criteria and the use of older age participants (above 45 years) that needs to be addressed before the final thesis is submitted. It is suggested that further analysis of the complete data be conducted to determine if there are significant associations between demographic and clinical characteristics with knowledge and attitudes related to PCOS.

Conclusion:

The study included 384 participants and examined their demographic and clinical characteristics in the context of polycystic ovary syndrome (PCOS). The majority of participants were aged 18–25 years (44.3%), single (73.2%), illiterate (52.1%), and housewives (56.0%). Regarding previous medical history, 43.5% reported no previous medical conditions,

while hypertension, diabetes mellitus, and hypothyroidism were reported by 21.6%, 19.0%, and 15.9% of participants, respectively. These findings provide an overview of the participants' sociodemographic and clinical profiles. Comprehensive conclusions regarding women's knowledge and attitudes toward PCOS and its dermatological manifestations require the actual knowledge and attitude scores and their statistical analysis.

Recommendations

Based on the study context and demographic findings, the following recommendations are proposed:

1. Health education: Develop structured educational programs to improve women's understanding of PCOS, its causes, symptoms, complications, and management.
2. Awareness of dermatological manifestations: Provide information about acne, hirsutism, androgenic alopecia, acanthosis nigricans, and other skin changes associated with PCOS.
3. Accessible educational materials: Prepare educational resources in simple language and local languages to accommodate women with different educational backgrounds.
4. Multidisciplinary care: Encourage collaboration among gynecologists, dermatologists, endocrinologists, nurses, and other relevant healthcare professionals.
5. Early consultation: Encourage women experiencing persistent or worsening skin manifestations to seek appropriate medical assessment rather than relying solely on self-treatment.
6. Psychological support: Integrate counseling and appropriate psychological support into PCOS management, particularly for women experiencing concerns about body image, self-confidence, or social relationships.
7. Future research: Conduct larger studies across multiple healthcare settings to investigate the relationship between sociodemographic characteristics, PCOS knowledge, attitudes, and healthcare-seeking behavior.

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