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The Role of Ultrasonography in Polycystic Ovarian Syndrome Diagnosis and its Psychological Impact on Women's Well-Being in the Faisalabad Region, Pakistan

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Abstract

Background & Objective: Polycystic Ovary Syndrome (PCOS) is one of the most prevalent endocrine disorders in women and is associated with diverse reproductive and metabolic complications. Beyond physical manifestations such as menstrual irregularities, weight gain, hirsutism, and hair loss, many women also experience emotional challenges, including stress, depression, and reduced self-esteem. This study aimed to examine the psychological implications of PCOS and to identify supportive measures that may enhance comprehensive patient care.

Materials & Methods: A community-based survey was conducted among women diagnosed with PCOS. Participants provided detailed information on their symptoms, treatment outcomes, and psychological experiences, enabling assessment of the relationship between physical manifestations and emotional health.

Results: Irregular menstrual cycles were reported by 84% of participants and were frequently accompanied by fertility-related concerns. Excessive hair growth (77%) and hair thinning (69%) adversely affected participants' confidence and body image. Obesity was observed in 63% of respondents and was frequently associated with reduced quality of life. Although 62% reported improvement with medication, 20% continued to experience psychological difficulties, particularly heightened anxiety, persistent low mood, and reduced self-worth. These findings indicate that PCOS significantly affects both physical functioning and psychological well-being.

Conclusion: PCOS exerts a substantial impact on women's daily lives by affecting both physical health and emotional well-being**.** The persistence of psychological distress despite treatment underscores the need for integrated management approaches that combine lifestyle interventions, pharmacological therapy, and structured mental health support**.** Further research is required to identify high-risk subgroups and develop personalized strategies that support long-term wellness.

Keywords: Polycystic ovary syndrome, Diagnosis, ultrasonography, complications, well-being, Pakistan

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Introduction

Polycystic Ovary Syndrome (PCOS) is a prevalent endocrine disorder which affects approximately 4–12% of women of reproductive age worldwide (1). It is characterized by a

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constellation of reproductive and metabolic disturbances, including menstrual irregularities, hirsutism, acne, obesity, and infertility, and it is further associated with long-term health risks such as type 2 diabetes mellitus and cardiovascular disease (1). While the clinical features of PCOS are well documented, emerging evidence indicates that the syndrome extends beyond physical manifestations to encompass significant psychological and social consequences (2).

Several studies have demonstrated that women with PCOS frequently experience depression, anxiety, low self-esteem, and dissatisfaction with body image. Symptoms such as abnormal hair growth, obesity, and acne often contribute to stigma and emotional distress, while infertility concerns may intensify feelings of inadequacy (3). These psychological challenges negatively affect health-related quality of life and, in some cases, impair academic performance, professional development, and interpersonal relationships (4). Moreover, the increased prevalence of eating disorders and mood disorders among women with PCOS highlights the need for holistic management approaches that integrate medical, psychological, and lifestyle interventions (5).

Despite this growing body of evidence, the majority of existing research has centered on biomedical and reproductive outcomes, with limited exploration of the psychosocial dimensions of PCOS (6). Importantly, few studies have examined these aspects in low- and middle-income countries, where cultural expectations, healthcare accessibility, and disease awareness may shape women's experiences differently from those in higher-income settings (7, 8).

The ovaries are paired endocrine organs essential for hormone production and reproduction, regulating ovulation, corpus luteum formation, and menstruation. Disorders such as cyst formation, torsion, or malignancy may impair ovarian function and typically require assessment via ultrasound or laparoscopy (9). Anatomically, the ovaries are situated in the ovarian fossae near the fallopian tubes and are supported by ligamentous structures with vascular supply provided by the ovarian artery and vein; their size and hormonal activity vary with age and play a central role in the hypothalamic–pituitary–ovarian axis and ovulatory regulation (10, 11).

In Pakistan, there is a notable lack of community-based evidence investigating how PCOS affects women's psychological well-being, educational engagement, and overall quality of life (12). Most regional studies focus primarily on clinical or reproductive outcomes, overlooking the broader psychosocial burden. This gap in knowledge restricts the development of patient-centered interventions that address both the physical and emotional challenges faced by women with PCOS (13, 14). Therefore, this study aimed to investigate the physical and psychological burdens of PCOS among women in Faisalabad, Pakistan, using a community-based approach.

Materials and Methods

Study design and setting: This study adopted an observational, cross-sectional design and was conducted over a one-year period. Participants were recruited from outpatient gynecology and endocrinology clinics as well as diagnostic centers. Data collection took place between August 2023 and June 2024, and the project was completed in 2024. Ethical approval was obtained from the Institutional Review Board (IRB) prior to data collection, and written informed consent was secured from all participants. The study adhered to the National Bioethics Committee (NBC) of Pakistan Ethical Guidelines for Research Involving Human Participants (2018). The ethical approval code issued by the Institutional Review Board was IRB/BIOS/UOS/2024/06.

Participants: Eligible participants were women aged 18–45 years with a physician-

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confirmed PCOS diagnosis based on the Rotterdam criteria. Only residents of Faisalabad who voluntarily agreed to participate were included. Exclusion criteria comprised pregnancy or breastfeeding, the presence of other endocrine disorders such as Cushing's syndrome or congenital adrenal hyperplasia, previous ovarian surgery, or the use of systemic hormone therapy.

Sampling technique and sample size: A multi-site consecutive sampling strategy was employed. Women meeting eligibility criteria and visiting participating centers during the study period were invited to participate. Recruitment was stratified by facility type (public hospital, private clinic, and diagnostic center) to enhance representativeness. The sample size was estimated using the formula for a single population proportion, assuming a 40% prevalence of moderate-to-severe psychological distress among women with PCOS according to reference (3), with a 95% confidence level and a 7% margin of error. The calculated minimum sample size was 188. After adjustment for a 1.2 design effect and a 10% allowance for non-response, the final target sample was approximately 248 participants.

Measures: A structured questionnaire was administered to collect sociodemographic and clinical data, including age, education, occupation, marital status, height, weight, body mass index (BMI), menstrual characteristics, dermatological symptoms, reproductive history, and lifestyle practices.

Psychological outcomes were assessed using validated instruments:

• DASS-21 (Depression, Anxiety, Stress Scale-21) to measure levels of depression, anxiety, and stress.

• SF-36 (Short Form Health Survey, integrated into a self-developed performa) to evaluate quality of life across physical and mental health domains and to assess the age distribution of participants (15, 16).

Both tools have been widely used in clinical and community settings and demonstrate strong reliability and validity.

Data Analysis: All data were coded and entered into SPSS version 26 (17). Descriptive statistics were computed for demographic and clinical characteristics. Associations between lifestyle factors, clinical features, and psychological outcomes were examined using chi-square tests, t-tests, or ANOVA (analysis of variance), as appropriate. Correlation analyses and multivariable regression models were applied to identify predictors of psychological distress and quality-of-life impairment. A two-tailed p-value < 0.05 was considered statistically significant (18).

Results

In this study, we included 100 patients, most of whom were diagnosed with PCOS and were experiencing depression, anxiety, and stress. The participants were women between the ages of 18 and 45. The results are presented through graphs and key variables to enhance clarity and comprehension (Figure 1).

According to our findings, the majority of participants diagnosed with PCOS were between the ages of 20 and 25. However, a smaller yet notable proportion of women reported experiencing PCOS symptoms and receiving diagnoses between the ages of 30 and 45. This pattern suggests that although PCOS is

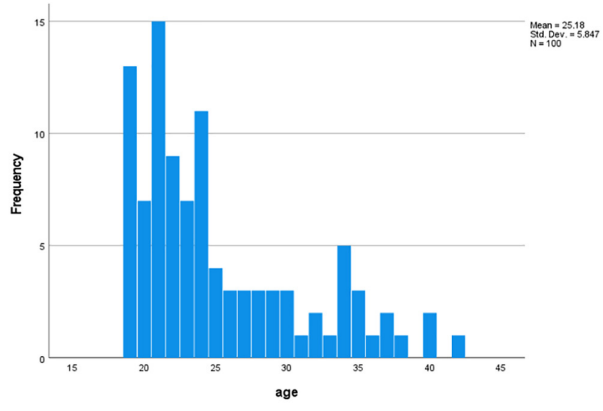

Figure 1. Age frequency of patients.

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most frequently identified in younger women, particularly those in their early twenties, the condition is not confined to this group and may also emerge later in the reproductive years. Figure 1 shows that the standard deviation was 5.847, and the mean age was 25.18.

PCOS can significantly impact fertility. Although women can still conceive naturally up to the age of 37, fertility typically begins to decline after age 32, with a sharper reduction occurring after 37. Among women with PCOS, the highest likelihood of natural conception generally occurs before age 35, especially in those with regular ovulatory cycles and no additional fertility complications. The weight frequency of patients has been represented in Figure 2.

Figure 2 clearly shows that most women with Polycystic Ovarian Syndrome (PCOS) are overweight, while only a few have the condition without being overweight. In PCOS, body cells become less responsive to insulin, resulting in insulin resistance. To compensate, the pancreas produces more insulin, which contributes to weight gain. In our sample of 100 women aged 18 to 45 years, the mean body weight was 62.94 kg (SD = 13.417). Many participants reported psychological effects such as anxiety, low self-esteem, and concerns about infertility. Social pressures relating to body image and expectations of motherhood further intensified their stress levels. These findings highlight the importance of providing both emotional and medical support for women with PCOS.

Figure 3 illustrates the marital status of patients aged 18 to 45 years included in our study, comprising both married and unmarried women, although the majority were unmarried. PCOS is a common cause of irregular menstrual cycles, particularly among young, unmarried women. The mean marital status score in our sample was 1.3 (SD = 0.461).

Descriptive Statistics

Table 1 summarizes the clinical and psychological experiences of women with PCOS. On average, the time since diagnosis was 2.46 years (SD = 1.132), suggesting that most women had been living with the condition for a moderate duration. The mean emotional well-being score at diagnosis was 2.58 (SD = 0.843), indicating a considerable degree of psychological strain. Participants also reported noticeable physical changes following diagnosis, with a mean score of 1.58 (SD = 0.781), showing that bodily symptoms were commonly experienced. The perceived adequacy of available psychological support and resources had a mean score of 2.51 (SD = 4.439), reflecting wide variability and potential gaps in support. In terms of disclosure, the average comfort level in discussing PCOS with others was 2.20 (SD = 0.402), suggesting

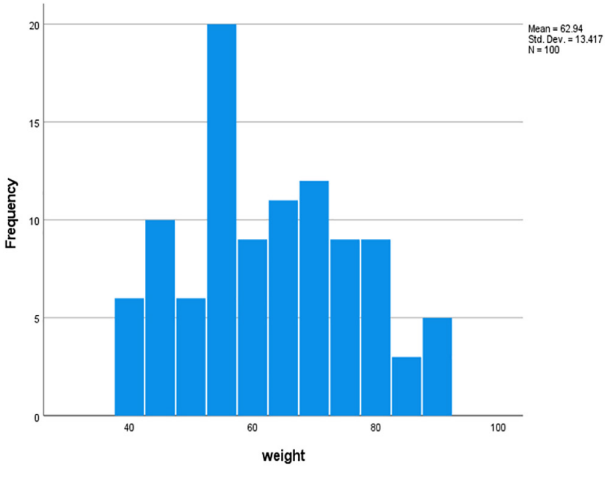

Figure 2. Weight frequency of patients.

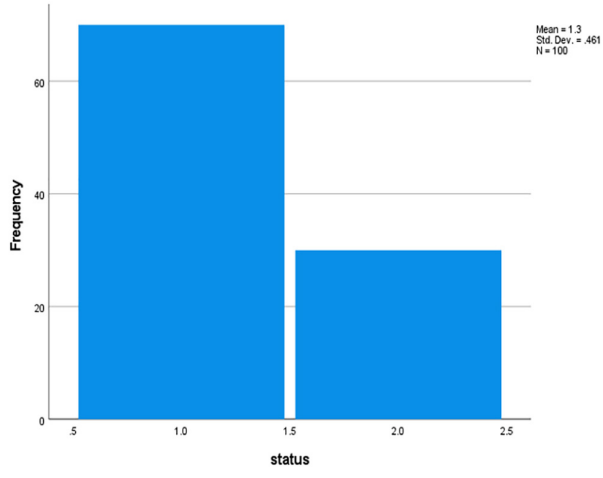

Figure 3. Status of patients.

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Table 1. The table provides insights into the experience of individuals with Polycystic Ovary Syndrome (PCOS).

	No.Patients	Minimum	Maximum	Mean	Std. Deviation
How long have you been diagnosed with PCOS?	100	1	4	2.46	1.132
When you were diagnosed with PCOS, what was your emotional well-being	100	1	4	2.58	.843
When you were diagnosed with PCOS, did you notice any changes in your body?	100	1	3	1.58	.781
How satisfied are you with the support and resources available for managing the psychological impact of PCOS	100	1	33	2.51	4.439
Do you feel Comfortable discussing your PCOS diagnosis with others	100	2	3	2.20	.402
Valid N (list-wise)	100				

that most women felt only partially comfortable sharing their condition. Collectively, these data underscore that PCOS manifests not only through clinical symptoms but also through substantial emotional and social challenges, reinforcing the need to strengthen psychological and social support mechanisms for affected women.

Figure 4 summarizes the occurrence of major clinical features among the study participants. Ultrasound confirmation of PCOS was the most frequently observed finding, present in 84% of women. Other common manifestations included hirsutism (77%), dysmenorrhea (71%), obesity (69%), and alopecia (63%). Gastrointestinal complaints, particularly nausea and vomiting, were reported by 56% of the cohort, making them the least frequent symptom.

A smaller subset of participants did not present with these features, including 21% without obesity, 17% without dysmenorrhea, 17% without alopecia, 16% without ultrasound-confirmed PCOS, 9% without hirsutism, and 26% without nausea or vomiting. Taken together, these patterns indicate that reproductive and metabolic disturbances such as hirsutism, dysmenorrhea, and obesity constitute the predominant clinical burden among women with PCOS, whereas gastrointestinal symptoms tend to be less consistent. The observed variability highlights the heterogeneous nature of PCOS and underscores the importance of employing a multidimensional diagnostic framework.

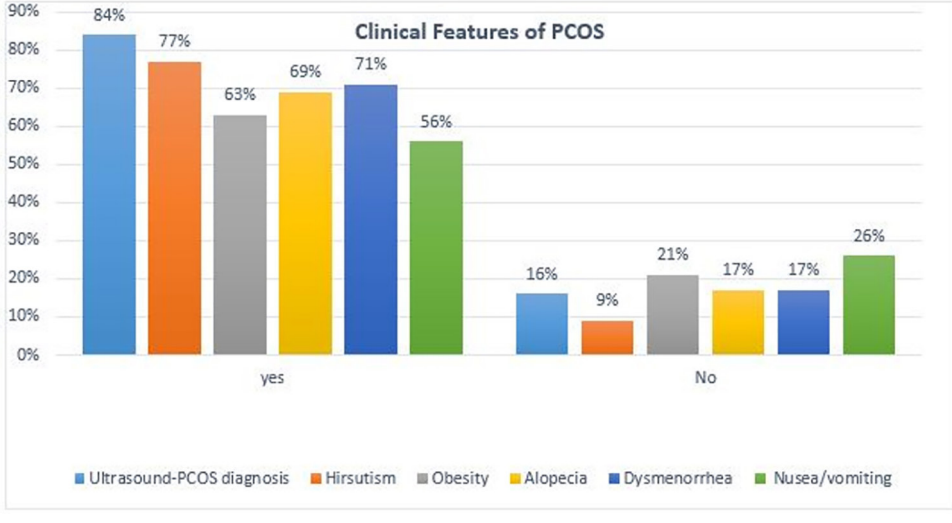

Figure 4. Graphical Representation of Clinical Features of PCOS.

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Table 2. Summary of DASS-21 and SF-36 Scores Among Women with PCOS (n = 100).

Scale	Domain	Minimum	Maximum	Mean	Std. Deviation	Interpretation
DASS-21	Depression	4	28	14.8	6.2	Moderate
	Anxiety	3	25	12.5	5.7	Moderate
	Stress	5	32	16.9	7.1	Moderate–Severe
SF-36	Physical Functioning	30	95	62.4	15.3	Below average
	Role Limitations (Physical)	25	90	58.7	14.1	Mild limitation
	Role Limitations (Emotional)	20	85	55.2	13.6	Mild–Moderate limitation
	Vitality (Energy/Fatigue)	22	75	49.8	12.9	Reduced vitality
	Mental Health	28	80	52.1	13.4	Below average
	Social Functioning	40	88	60.5	11.8	Mild impairment
	Bodily Pain	35	92	65.3	14.0	Mild pain limitation
	General Health	33	85	57.9	13.2	Below average

Summary of DASS-21 and SF-36 Scores Among Women with PCOS (n = 100). Table 2 presents mean scores and variability for the DASS-21 and the Short Form Health Survey (SF-36). Overall, the results demonstrate moderate psychological distress and below-average health-related quality of life, emphasizing the interrelationship between emotional well-being and lifestyle factors in women with PCOS.

Discussion

This study shows that PCOS affects women on multiple levels. Beyond the biological and hormonal problems, women often struggle with emotional challenges such as depression, anxiety, stress, and negative body image. The uncertainty associated with delayed diagnosis, together with symptoms including irregular menstrual cycles, infertility, weight gain, and hirsutism, further heightens psychological distress. These outcomes suggest that PCOS is not merely a physical condition but also a social and mental health concern that requires comprehensive care.

The findings are in line with previous studies. For instance, Cutler (19) pointed out that obesity in PCOS cannot be explained only by excess calorie intake but is strongly related to hormonal and metabolic changes like insulin resistance. He also highlighted that improving diet quality, especially with fiber and magnesium, helps reduce symptoms and supports mental well-being, **a** conclusion that aligns closely with the present study. Similarly, Oberg and Lundell (20) reported that women with PCOS who are overweight often suffer a decline in psychological health. While lifestyle interventions can improve symptoms, medical and psychological treatments are often necessary to achieve better outcomes. This observation reinforces the current study's conclusion that an integrated management strategy is essential. In addition, Begum, Singh, and Mohan (21) linked junk food consumption and sedentary habits to worsening PCOS symptoms and higher stress levels, which supports the present findings indicating that lifestyle is intrinsically connected to both physical and psychological health in PCOS.

The psychological difficulties linked with PCOS likely arise from a combination of biological, emotional, and social factors. Hormonal imbalances such as high androgen levels and insulin resistance contribute to visible symptoms like obesity and excessive hair growth, which can harm self-esteem. Social expectations related to fertility and appearance add further stress, especially when the diagnosis is delayed or unclear (22). Unhealthy dietary patterns and insufficient physical activity exacerbate metabolic disturbances, creating a self-perpetuating cycle that intensifies both physiological and emotional challenges.

The results underscore the need for a coordinated

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and patient-centered care model for PCOS. Health professionals should not only focus on treating hormonal and metabolic aspects but also address psychological well-being through counseling and support programs. Educational initiatives can help women understand the importance of lifestyle changes while equipping them with stress-management techniques and adaptive coping skills. Moreover, public health campaigns promoting balanced nutrition and regular physical activity may contribute to reducing both the prevalence and severity of PCOS.

For medical education, training programs should prepare healthcare workers to recognize the emotional effects of PCOS and provide holistic, patient-centered care. Educational interventions, including awareness programs, counseling, and patient education, are also essential to enhance understanding, reduce stigma, and support effective PCOS management.

While informative, this study has several limitations. Because it is cross-sectional, it cannot establish cause-and-effect relationships between PCOS and psychological outcomes. Additionally, the reliance on self-reported data introduces the possibility of self-report bias, as participants may underreport or overreport symptoms due to social desirability, stigma, or personal perceptions, particularly with respect to sensitive issues such as body image, stress, and emotional well-being. The absence of standardized psychological assessment tools further limits the comparability of our findings with those of other studies. Moreover, the relatively small sample size and single-location setting restrict the generalizability of the results. Future research employing larger, multi-center samples and validated psychological assessment instruments would strengthen the evidence base and enhance the applicability of the findings.

A further limitation is the lack of standardized psychological assessment tools, which complicates direct comparison with existing research. Finally, the modest sample size and single-site recruitment may constrain the extent to which these findings can be generalized, reinforcing the need for larger, multi-site investigations.

Conclusion

This study highlights the multidimensional burden of PCOS, with menstrual irregularities, hirsutism, obesity, alopecia, and headaches emerging as the most common symptoms. These findings indicate that PCOS affects not only reproductive health but also physical well-being and overall quality of life. While pharmacological treatment offered relief for many participants, a considerable number continued to experience psychological distress, underscoring the critical need for an integrated and comprehensive management approach. A strategy that combines medical care, lifestyle modification, and psychological support is essential to improve outcomes for women living with PCOS.

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Conflict of Interest

The authors declare no conflict of interest.

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Code of Ethices

The ethical approval code issued by the Institutional Review Board was IRB/BIOS/UOS/2024/06.

Author's Contributions

Sharafat Ali: Writing – review and editing; supervision; conceptualization. Qasim Maimona:

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Writing – original draft; investigation; data curation. Nasreen Fatima, Muhammad Bashir, Muhammad Shoaib Malik: Methodology; investigation; data curation; conceptualization.

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