

Impact of Polycystic Ovary Syndrome on Health-Related Quality of Life: A Cross-Sectional Study Using the PCOSQOL Scale

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ABSTRACT

Background: Polycystic ovary syndrome (PCOS) is associated with metabolic and psychological morbidity, yet limited Indian data using disease-specific quality-of-life instruments exist. This study assessed health-related quality of life (QoL) using the PCOSQOL scale and identified sociodemographic and clinical predictors.

Methods: A hospital-based cross-sectional study was conducted among 125 women aged 15–35 years with PCOS diagnosed by Rotterdam criteria at a tertiary care hospital in Hyderabad. QoL was measured using the 35-item PCOSQOL instrument. Sociodemographic and clinical variables were recorded. Pearson correlation, independent t-test, and multivariable linear regression were applied; results are presented as β coefficients with 95% confidence intervals (CI).

Results: Mean age was 21.26 ± 4.58 years and BMI 23.56 ± 5.72 kg/m². Mood had the lowest QoL score (5.01 ± 1.82). BMI negatively correlated with all domains ($r = -0.27$ to -0.32 ; $p \leq 0.002$). In adjusted models, BMI independently predicted poorer Impact ($\beta = -0.10$; 95%CI -0.15, -0.05; $p < 0.001$), Infertility ($\beta = -0.08$; 95%CI -0.13, -0.04; $p = 0.001$), Hirsutism ($\beta = -0.11$; 95%CI -0.17, -0.06; $p < 0.001$), and Mood ($\beta = -0.12$; 95%CI -0.18, -0.06; $p < 0.001$). Urban residence predicted poorer Mood ($\beta = -1.23$; 95%CI -1.90, -0.57; $p < 0.001$).

Conclusion: PCOS significantly impairs QoL, particularly psychological well-being. Higher BMI and urban residence are key determinants, underscoring the need for integrated lifestyle and psychological care.

Keywords: Polycystic Ovary Syndrome, Health-Related Quality of Life, Body Mass Index, Psychological Distress, Cross-Sectional Studies, Reproductive-Age Women, Multivariable Analysis

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INTRODUCTION

Polycystic ovary syndrome (PCOS) is a common endocrine disorder affecting women of reproductive age. In addition to its reproductive and metabolic manifestations, the condition is frequently associated with adverse psychological outcomes, including anxiety, depressive symptoms, concerns regarding body image, and reduced self-esteem.¹⁻⁵ These factors may adversely influence health-related quality of life (QoL), making QoL assessment an important component of clinical care.

In India, the reported prevalence of PCOS varies widely, ranging from 3.7% to 22.5%, according to study methodology and diagnostic criteria.⁶ With increasing recognition of associated physical and psychological morbidity, PCOS is now regarded as an emerging public-health concern. Recent Indian studies have demonstrated that women with PCOS experience impaired QoL, particularly when obesity and psychological distress coexist.⁷⁻¹² International evidence similarly identifies BMI, sociodemographic factors, and duration since diagnosis as key determinants of QoL.¹³⁻¹⁹

Generic QoL instruments may not fully capture the specific psychosocial burden of PCOS. The Polycystic Ovary Syndrome Quality of Life (PCOSQOL) scale²⁰ was developed for this purpose, assessing QoL across four domains related to emotional well-being, infertility concerns, symptoms of hirsutism, and overall life impact. However, there remains limited use of this tool in Indian clinical settings.

Accordingly, the present study aimed to assess QoL among women with PCOS using the PCOSQOL instrument and to identify associated sociodemographic and clinical determinants.

METHODOLOGY

Study design and setting: A cross-sectional study was conducted among women attending the outpatient department of a tertiary care teaching hospital in Hyderabad, Telangana, over a two-month period.

Sample size: For regression-based analysis, methodological guidance recommends a minimum of 10-15 participants per predictor variable.²¹ As six predictors were included in the regression models, a minimum sample size of approximately 90 participants was considered adequate. The achieved sample of 125 participants therefore fulfilled the accepted requirements for multivariable linear analysis.

Study participants: Women aged 15-35 years with a clinical diagnosis of PCOS based on Rotterdam criteria (2003)²² was eligible for inclusion. Women with Cushing's, malignancy, congenital disorders, psychotic disorders, or those who used antidepressants, steroid hormone drugs, or mood stabilizers were excluded. Consecutive sampling continued until 125 participants were recruited. Institutional Ethics

Committee approval (Rc. No: IEC/GMC/2022/08/13) was obtained, and written informed consent was secured from all participants.

Data collection : QoL was assessed using a self-administered PCOSQOL questionnaire²⁰, comprising 35 items grouped into four domains : Impact, Infertility, Hirsutism, and Mood. Each item is rated on a 7-point Likert scale (1 representing the lowest QoL and 7 the highest). Domain scores were calculated as mean values; higher scores indicate better QoL. The instrument demonstrates excellent internal consistency (Cronbach's α approximately 0.95) and has been previously validated in diverse PCOS populations. As formal cultural validation has not yet been undertaken in India, a brief pilot administration was conducted among a small group of eligible participants to assess the clarity and acceptability of the questionnaire items. The tool was well understood, and no modifications were required prior to commencement of the main study. Sociodemographic and clinical data collected included age, BMI, marital status, educational level, age at diagnosis, and duration since diagnosis (months).

Statistical analysis: Continuous variables were summarized as mean and standard deviation, and categorical variables as frequencies and percentages. Group differences in mean QoL scores were examined using the independent-sample t-test or one-way ANOVA. Associations between continuous predictors and QoL domains were assessed using Pearson correlation. Separate multivariable linear regression models were constructed for each QoL domain, including age, BMI, education, marital status, locality, and duration since diagnosis as covariates. Model assumptions (linearity, independence, normality, homoscedasticity of residuals, and absence of problematic multicollinearity) were assessed and satisfied. Statistical significance was defined as $p < 0.05$ (and 95% confidence intervals where applicable). Analyses were performed using SPSS (trial version).

RESULTS

The clinical and sociodemographic profile of participants is summarized in Table 1. The cohort comprised predominantly young women in their early twenties, with BMI values spanning from underweight to obese categories. Most participants were urban residents, unmarried, and had attained graduate-level education. The duration since diagnosis showed considerable dispersion, indicating variability in disease chronicity within the study population.

Domain-wise quality-of-life scores are outlined in Table 2. Among the PCOSQOL domains, infertility demonstrated the highest mean score, whereas mood had the lowest, suggesting comparatively greater emotional impact. Impact and hirsutism domains showed intermediate scores, with all domains reflecting a broad range of responses across participants.

Table 1: Clinical and Sociodemographic Characteristics of Participants

Variable	Mean ± SD (Min-Max)
Age (years)	21.26 ± 4.58 (15-35)
BMI (kg/m ²)	23.56 ± 5.72 (14.6-45.4)
Age at diagnosis (years)	19.27 ± 4.35 (12-37)
Duration since diagnosis (months)	20.09 ± 26.79 (1-156)
Locality	
Urban	89 (71.2)
Rural	36 (28.8)
Marital status	
Unmarried	98 (78.4)
Married	27 (21.6)
Education level	
Graduate+	97 (77.6)
≤ School	28 (22.4)

Table 2: PCOSQOL Domain Scores

Domain	Mean ± SD (Min - Max)
Impact	5.24 ± 1.45 (1.38 - 7.00)
Infertility	6.15 ± 1.52 (1.00 - 7.00)
Hirsutism	5.84 ± 1.77 (1.00 - 7.00)
Mood	5.01 ± 1.82 (1.00 - 7.00)

Table 3: Domain-wise subgroup analysis of PCOSQOL scores (Mean ±SD)

Variable	Impact	Infertility	Hirsutism	Mood
Locality				
Urban (89)	5.17 ± 1.50	6.09 ± 1.53	5.65 ± 1.80	4.66 ± 1.84
Rural (36)	5.41 ± 1.33	6.31 ± 1.50	6.31 ± 1.62	5.88 ± 1.45
Marital status				
Unmarried (98)	5.23 ± 1.44	6.45 ± 1.11	5.85 ± 1.72	4.98 ± 1.82
Married (27)	5.27 ± 1.53	5.06 ± 2.21	5.81 ± 1.97	5.12 ± 1.85
Education				
Graduate+ (97)	5.18 ± 1.49	6.12 ± 1.51	5.77 ± 1.82	5.01 ± 1.85
≤ School (28)	5.45 ± 1.35	6.28 ± 1.57	6.08 ± 1.61	5.03 ± 1.75

Table 4: Bivariate analysis between participant characteristics and PCOSQOL domains. - Values presented as r (p) for continuous variables and t (p) for categorical variables; Higher score = better QoL.)

Predictor	Impact	Infertility	Hirsutism	Mood
Age (years)	r = +0.02 (0.84)	r = +0.05 (0.59)	r = -0.04 (0.68)	r = +0.03 (0.74)
BMI (kg/m ²)	r = -0.31 (<0.001)	r = -0.27 (0.002)	r = -0.28 (0.001)	r = -0.32 (<0.001)
Duration since diagnosis (months)	r = -0.16 (0.071)	r = -0.11 (0.235)	r = -0.21 (0.017)	r = -0.25 (0.004)
Locality (Urban vs Rural)	t = -0.89 (0.38)	t = -1.59 (0.11)	t = -1.76 (0.08)	t = -3.89 (<0.001)
Marital status (Married vs Unmarried)	t = -0.11 (0.91)	t = -0.60 (0.55)	t = -0.34 (0.73)	t = -0.35 (0.73)
Education (Graduate+ vs ≤ School)	t = -0.42 (0.67)	t = -1.59 (0.11)	t = -1.89 (0.06)	t = -0.52 (0.60)

Table 5: Multivariable Linear Regression Predicting PCOSQOL Domain Scores - β(p) with 95% CI

Predictor	Impact β (95% CI) p value	Infertility β (95% CI) p value	Hirsutism β (95% CI) p value	Mood β (95% CI) p value
Age (years)	0.08 (-0.02 to 0.17) p = 0.11	0.07 (-0.02 to 0.16) p = 0.11	-0.01 (-0.12 to 0.10) p = 0.88	0.07 (-0.04 to 0.18) p = 0.19
BMI (kg/m ²)	-0.10 (-0.15 to -0.05) p <0.001	-0.08 (-0.13 to -0.04) p = 0.001	-0.11 (-0.17 to -0.06) p <0.001	-0.12 (-0.18 to -0.06) p <0.001
Urban locality†	-0.29 (-0.86 to 0.28) p = 0.32	-0.06 (-0.61 to 0.49) p = 0.83	-0.58 (-1.26 to 0.10) p = 0.09	-1.23 (-1.90 to -0.57) p <0.001
Married status‡	-0.11 (-1.09 to 0.87) p = 0.83	-1.82 (-2.77 to -0.87) p <0.001	0.62 (-0.56 to 1.80) p = 0.30	0.45 (-0.70 to 1.60) p = 0.44
Duration*	-0.006 (-0.015 to 0.004) p = 0.23	-0.003 (-0.012 to 0.006) p = 0.51	-0.008 (-0.019 to 0.004) p = 0.17	-0.011 (-0.023 to 0.000) p = 0.050
Higher education§	-0.34 (-0.98 to 0.29) p = 0.29	-0.80 (-1.41 to -0.18) p = 0.01	-0.41 (-1.17 to 0.36) p = 0.29	-0.10 (-0.85 to 0.64) p = 0.79

Abbreviations: β, regression coefficient; CI, confidence interval; BMI, body mass index.

† Reference category: rural locality; ‡ Reference category: unmarried; § Reference category: ≤school education; *Duration since diagnosis in months

Subgroup comparisons across locality, marital status, and education are detailed in Table 3. Rural participants exhibited relatively higher mood and hirsutism scores than urban women. Married participants reported lower infertility-related scores compared to unmarried women. Educational status showed minimal variation across domains, with only marginal differences in mean scores.

The bivariate relationships between participant characteristics and PCOSQOL domains are presented in Table 4. BMI demonstrated a significant negative correlation across all domains, indicating poorer quality of life with increasing BMI. Longer duration since diagnosis was associated with lower hirsutism and mood scores. Urban residence showed a significant association with lower mood scores, while age, marital status, and education were not significantly related to domain scores.

Adjusted associations derived from multivariable linear regression are shown in Table 5. BMI remained an independent negative predictor across all quality-of-life domains. Urban locality independently predicted poorer mood scores.

Married status and higher educational attainment were independently associated with lower infertility scores, whereas other variables did not demonstrate significant independent effects after adjustment.

DISCUSSION

This study demonstrates that women with PCOS experience impaired quality of life across multiple domains, most prominently in psychological well-being. Higher BMI was the most consistent determinant of poorer QoL, while longer duration since diagnosis showed an adverse association, particularly with Mood, suggesting that both metabolic burden and chronicity of illness contribute to diminished well-being. These findings align with broader evidence that excess weight, sociodemographic factors, and illness duration influence QoL in women with PCOS.^{1,13,15-17}

Urban residence was independently associated with poorer Mood-related QoL; however, this association should be interpreted cautiously as underlying mechanisms were not directly assessed. Age, marital status, and education were not consistent independent predictors of QoL, indicating that impairment affects women with PCOS across diverse sociodemographic backgrounds.^{9,11,12,17}

Indian and international studies consistently show impaired QoL in women with PCOS, particularly in psychological domains, consistent with the prominent Mood impairment observed in our study. Indian studies⁷⁻¹² support our finding that higher BMI and longer duration of illness are associated with poorer QoL, while international studies¹³⁻¹⁹ highlight higher levels of anxiety, depression, and reduced psychosocial well-being, emphasizing the need for integrated metabolic and psychological care.

Together with existing literature, our findings reinforce that PCOS is a chronic condition with both physical and psychological consequences, underscoring the need for holistic management, including lifestyle counselling and routine psychological support.^{2,23,24}

LIMITATIONS

This study has several limitations. As it was conducted in a hospital-based sample, the findings may not be fully generalizable to the wider community. The cross-sectional design does not permit inference of causality. QoL assessment relied on self-reported data, which may be subject to recall and reporting bias. Biochemical indices of disease severity were not included, and a control group was not recruited for comparison. Although multivariable analysis was undertaken, the possibility of residual confounding cannot be excluded. The relatively short study duration may also limit assessment of longer-term psychosocial outcomes. Additionally, while the

PCOSQOL scale was pilot-tested for clarity and acceptability in this setting, formal cultural validation in the Indian population has not yet been undertaken, which may affect the cultural sensitivity of some items and should be considered when interpreting the findings.²⁵

CONCLUSION

Women with PCOS experience significant impairment in QoL, particularly in relation to emotional well-being. Higher BMI was the strongest independent determinant of poorer QoL, while urban residence and longer duration since diagnosis were associated with worse Mood-related QoL. These findings support the integration of routine QoL screening, lifestyle intervention, and psychological support into comprehensive PCOS management. As this was a cross-sectional study, the observed associations should be interpreted as correlational rather than causal.

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Availability of Data: The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Declaration of Non-use of Generative AI Tools: This article was prepared without the use of generative AI tools for content creation, analysis, or data generation. All findings and interpretations are based solely on the authors' independent work and expertise.

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