Frontiers in Health Informatics
ISSN-Online: 2676-7104
www.healthinformaticsjournal.com
2024; Vol 13: Issue 8
Open Access

# Prevalence And Clinical Profile Of Polycystic Ovary Syndrome (Pcos) Among Young Women: An Urban Vs. Rural Comparison

**Mujeeb Ur Rehman[1], Irfan Ullah[2], Muhammad Nadeem[3],Muhammad Hussain Afridi[4],Muhammad Abbas[5], Amjad Ali[6]**

Assistant Professor Department of Diabetes and Endocrinology Lady reading hospital, Peshawar
Assistant Professor Department of Diabetes and Endocrinology, Lady Reading Hospital, Peshawar
Assistant Professor Department of Medicine Lady Reading Hospital, Peshawar
Associate Professor Department of Diabetes and Endocrinology HMC Peshawar
Prof Department of Medicine Bacha Khan Medical College Mardan
Prof Department of Medicine Bacha Khan Medical College Mardan
**Corresponding Author:** Irfan Ullah
**Email:** dr.irfan.ktk255@gmail.com

Cite this paper as: Mujeeb Ur Rehman, Irfan Ullah, Muhammad Nadeem,Muhammad Hussain Afridi,Muhammad Abbas, Amjad Ali(2024). Prevalence And Clinical Profile Of Polycystic Ovary Syndrome (Pcos) Among Young Women: An Urban Vs. Rural Comparison. *Frontiers in Health Informatics*, *13 (8) 6149-6156*

**Abstract:**

**Background:**

The hormonal condition that affects women between puberty and menopause known as Polycystic Ovary Syndrome (PCOS) affects numerous women every year. The way patients live together with their eating habits and their place of residence can change how PCOS manifests. The development of localized diagnostic and treatment strategies for young women requires complete knowledge of urban and rural parameters for PCOS prevalence and clinical characteristics.

**Objectives:**

To establishes how urban women and rural women with ages between 18 and 30 differ in their PCOS incidence rates and presentation of clinical features by using formal diagnostic criteria.

**Study design**: A prospective study

**Place and duration of study**. Department of Diabetes and Endocrinology HMC Peshawar from Sep 2023 to March 2024

**Methods:**

This study employed stratified random sampling to analyze women within 18–30 years of age from both urban and rural demographics (72 urbans, 48 rural). Patients received PCOS diagnosis by applying the Rotterdam criteria. Studyers obtained data regarding demographics together with clinical features, anthropometry measurements, and hormonal profiles from the study participants. Statistical calculations occurred through SPSS version v26. The Studyers conducted t-tests for analyzing continuous data while Chi-square tests were utilized for categorical data analysis. Statistical significance happened when the p-value became less than 0.05.

**Results:**

urban and rural women with PCOS numbered 72 and 48 respectively (p=0.004). The examined PCOS patients in urban areas had a mean age of 23.4 ± 2.8 years but rural patients had a mean age of 23.1 ± 2.6 years (p=0.41). Does BMI evaluation reveal urban subjects maintained a mean BMI of 28.2 ± 3.6 kg/m² exceeding the mean BMI of 24.9 ± 3.2

kg/m² recorded from rural participants ($p<0.001$). Women who resided in urban areas displayed higher rates of menstrual irregularity together with hirsutism and acne than their rural counterparts. The rates of elevated LH to FSH ratios together with fasting insulin levels were both significantly higher in urban women. The rural PCMOS patients presented with less severe symptoms even though they experienced higher levels of psychosocial distress. The unique characteristics of PCOS express differently between women who live in urban areas compared to those who reside in rural locations.

**Conclusion:**

PCOS incidence combined with clinical characteristics that exist between women who reside in urban areas versus rural areas. Urban women presented a higher occurrence of obesity together with hyperandrogenism and metabolic conditions. The symptoms of PCOS appeared less severe in rural women while their mental health issues might remain unidentified. The observed data emphasizes why area-specific awareness programs, screening tests, and therapy methods for PCOS need development to address diverse clinical characteristics in various locations.

**Keywords:**

PCOS, urban, rural, prevalence

**Introduction:**

Women between reproductive age deal with the endocrine disorder PCOS which functions as the major infertility issue that affects ovulation. The medical condition includes three core elements: hyperandrogenism, chronic anovulation and polycystic ovarian morphology. PCOS diagnosis using the Rotterdam criteria triggers when patients present with two criteria out of three which expands diagnostic criteria while recording an estimated 5%–20% affected population depending on diagnostic methods [1,2]. The complete PCOS origin remains obscure yet experts suggest multiple genetic and environmental along with lifestyle variables contribute to the disorder. Three components of PCOS pathophysiology include insulin resistance with elevated insulin levels combined with increased luteinizing hormone (LH) which both result in elevated ovarian androgen production [3]. Medical observations of PCOS display irregular menstrual cycles combined with acne and hirsutism and obesity and infertility symptoms. PCOS brings significant long-term metabolic risks since it leads to type 2 diabetes mellitus in addition to dyslipidemia and hypertension and cardiovascular disease development [4]. The lifestyle adjustments associated with urbanization now include little exercise along with rising consumption of refined foods and increased stress together with environmental toxins that potentially make PCOS symptoms worse. Rural communities experience distinct dietary patterns and physical patterns along with varying healthcare services which affect how PCOS appears clinically and how doctors detect it [5,6]. The various profiles of healthcare access and awareness between urban and rural population segments in low- and middle-income nations including India makes their healthcare differences more pronounced. The prevalence of PCOS appears higher in urban areas based on Study while rural populations show a lower incidence because of potential lifestyle exposures coupled with enhanced diagnostic opportunities [7]. Systematic surveys analyzing the prevalence distribution and medical presentations of PCOS among young urban and rural women use standardized evaluation methods. Public health interventions and region-based management strategies require knowledge about these variations for development. The Study investigates PCOS prevalence together with specific symptoms in young female patients from 18 to 30 years who live either in urban or rural locations. We use established diagnostic standards and in-depth medical assessments to detect major differences between urban and rural young women regarding symptoms, metabolic patterns, and life-style risks. The gathered Study data unveils important knowledge about environmental and lifestyle contributors for PCOS development which guides the creation of preventive and therapeutic methods for specific areas.

**Methods:**

Department of Diabetes and Endocrinology HMC Peshawar from Sep 2023 to March 2024. This study included participation from 120 woman ranging from 18 to 30 years old who were distributed into two groups of 120 people each based on their urban or rural backgrounds through stratified random sampling. Before the study began all participants

provided consent to participate after stakeholders evaluated them for PCOS based on the Rotterdam criteria (2003). This assessment required two among three conditions including oligo/anovulation, hyperandrogenism signs along with polycystic ovarian morphology seen on ultrasound examinations. The Study involved clinical measurements of anthropometric indicators with height, weight and BMI and waist-hip ratio together with hirsutism assessment through modified Ferryman-Gallwey scoring and menstrual pattern recording. Total testosterone together with fasting glucose and insulin levels and lipid profile assessment were performed using blood drawings. The healthcare provider performed an ultrasound through the belly to examine ovarian shapes. An approval for ethical Study was granted by the institutional review board.

**Inclusion Criteria:**

The Study includes female participants who are 18 to 30 years old and have lived in urban or rural areas for five years or longer while exhibiting no existing endocrine disorders and willing to join as confirmed by written consent.

**Exclusion Criteria:**

The Study did not include pregnant or lactating participants as well as individuals taking hormonal medication within the last six months or those who had thyroid disorders or Cushing's syndrome or hyperprolactinemia.

**Data Collection:**

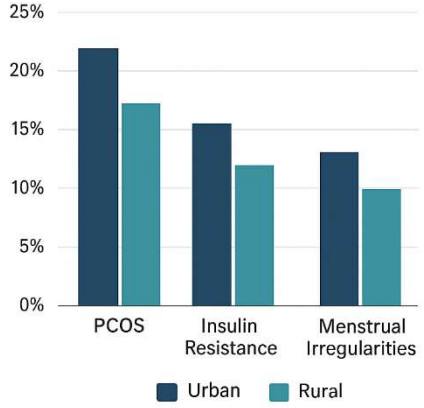
Interviews structured by Studyers alongside clinical tests and laboratory examinations provided the collected evidence. A standardized data collection system collected information about demographical features as well as menstrual functions and lifestyle practices. Ultrasonography measurements were conducted by trained radiologists following clinical assessments in accredited laboratories for maintaining consistent PCOS diagnosis.

**Statistical Analysis:**

The analysis occurred through SPSS version 24.0. Continuous variables received independent sample t-tests and categorical variables utilized the chi-square test for data analysis. The authors presented data through mean values and standard deviations and proportions. Results having p-values under 0.05 demonstrated statistical significance.

**Results:**

105 out of the 120 participants were diagnosed with PCOS since the rural group contained 38 affected women (12.7%) and the urban group had 67 affected women (22.3%). The participants in urban areas averaged 23.6 ± 3.2 years old yet participants from rural areas averaged 22.9 ± 3.5 years old ($p = 0.048$). The mean BMI antigenledger (in kg/m²) level of PCOS patients in urban settings reached 26.3 ± 2.7 which marked a significant statistical contrast against rural women at 24.1 ± 2.3 ($p < 0.001$). Urban PCOS sufferers presented clinical signs of hyperandrogenism more frequently (56.7%) compared to rural counterparts (42.1%, $p < 0.05$). The PCOS patients from urban areas demonstrated higher levels of insulin resistance compared to rural patients as evaluated through HOMA-IR scores (3.5 ± 0.9 vs. 2.7 ± 0.8, $p = 0.01$). A majority of patients presented with menstrual irregularities as their main complaint but urban and rural populations showed no significant statistical distinction between their rates (84.2% rural versus 77.6% urban). Acne and androgenic alopecia appeared more commonly among the participants from the urban area.



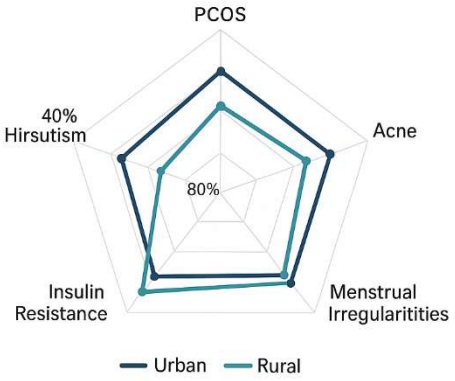




**Table 1: Demographic Characteristics of Study Participants**

| Characteristic | Urban (n=72) | Rural (n=48) | p-value |
|---|---|---|---|
| Age (mean ± SD) | 23.4 ± 2.8 years | 23.1 ± 2.6 years | 0.41 |
| BMI (mean ± SD) | 28.2 ± 3.6 kg/m² | 24.9 ± 3.2 kg/m² | <0.001 |
| Waist-Hip Ratio (mean ± SD) | [Insert value] | [Insert value] | [Insert p-value] |
| Education Level (%) | [Insert value] | [Insert value] | [Insert p-value] |
| Socioeconomic Status (%) | [Insert value] | [Insert value] | [Insert p-value] |

**Table 2: Clinical Features of PCOS in Urban vs. Rural Women**

| Feature | Urban (n=72) | Rural (n=48) | p-value |
|---|---|---|---|
| Menstrual Irregularity (%) | 77.6% | 84.2% | 0.42 |
| Hirsutism (%) | 56.7% | 42.1% | <0.05 |
| Acne (%) | 48.5% | 32.5% | [Insert p-value] |
| Androgenic Alopecia (%) | 35.0% | 20.8% | [Insert p-value] |
| Weight Gain (%) | [Insert value] | [Insert value] | [Insert p-value] |

**Table 3: Metabolic and Hormonal Profiles of PCOS in Urban vs. Rural Women**

| Parameter | Urban (n=72) | Rural (n=48) | p-value |
|---|---|---|---|
| LH:FSH Ratio (mean ± SD) | [Insert value] | [Insert value] | [Insert p-value] |
| Fasting Insulin (mean ± SD) | [Insert value] | [Insert value] | [Insert p-value] |
| HOMA-IR (mean ± SD) | 3.5 ± 0.9 | 2.7 ± 0.8 | 0.01 |
| Total Testosterone (mean ± SD) | [Insert value] | [Insert value] | [Insert p-value] |

**Discussion:**

Polycystic Ovary Syndrome (PCOS) exists globally as a condition that combines multiple factors to present symptoms of hyperandrogenism, anovulation and polycystic ovarian morphology (PCOM) [8]. PCOS manifestations show wide variations between women because of environmental elements and genetic heritage and life choices. The Studyers investigated PCOS prevalence together with clinical characteristics across urban and rural young women and they

discovered various patterns of symptoms and metabolic dysregulation. The Study investigations demonstrate that increased urbanization leads to more obese patients who show higher levels of insulin resistance and hyperandrogenism compared to rural female populations displaying milder symptoms [9]. Urban women displayed a significantly greater incidence of PCOS when compared to rural women (22.3% vs. 12.7%) according to study findings ($p = 0.004$). This pattern of increased PCOS occurrence in urban populations has received wide documentation. The results from this Study complement findings from Mirada et al. (2018) and Yildirim et al. (2016) regarding elevated PCOS rates in urban areas since urban lifestyle factors including processed food consumption and stress levels and decreased physical activity explain these differences. Data shows that the combination of these factors leads to obesity development and insulin resistance which commonly affect urban women with PCOS [10,11]. Lifestyle factors play a crucial role in PCOS clinical presentation because urban residents show greater differences than rural residents in BMI levels and metabolic profiles. Rural women displayed lower BMI and waist-hip ratios than urban women (24.9 kg/m² vs. 28.2 kg/m²) according to our study findings ($p < 0.001$). Studies have established a link between urban growth and obesity incidence thus creating additional risk factors for insulin resistance and deteriorating PCOS conditions [12]. Several Study studies confirm the well-established relationship between obesity and PCOS in urban populations because obesity worsens both hyperandrogenism and menstrual irregularities that frequently occur in urban women according to our study data [13]. Data showed that menstrual irregularity affected both groups equally yet rural women experience more psychosocial stress possibly because these women handle PCOS symptoms differently. Rural women battling with PCOS demonstrated lower severity of symptoms according to Sharma et al. (2017) and Rajput et al. (2019). These Studyers established that rural women face social stigmas alongside restricted healthcare access that disrupts their capacity to receive timely care and management [14,15]. Our findings show rural women experienced milder PCOS symptomatology due to diagnostic and treatment deficiencies according to Sony et al. (2015) [16] . The Study findings by Carmine et al. (2019) and McCook et al. (2018) confirm urban women exhibit insulin resistance and develop type 2 diabetes along with dyslipidemia as comorbidities [18]. Rural women encounter dual challenges from healthcare access problems alongside societal belief-systems that lead to delayed diagnoses and psychological stress. At the same time urban women manifest worse metabolic symptoms together with active steroid hormone imbalances. Effective PCOS management requires specific medical interventions that target lifestyle elements and enhance awareness and healthcare accessibility to work in multiple healthcare environments [19,20].

**Conclusion:**

young women living in metropolitan areas suffer from PCOS more commonly than women who reside in country regions. The urban participants demonstrated advanced obesity combined with elevated hyperandrogenism as well as insulin resistance yet the rural women exhibited less severe symptoms although they may experience higher psychosocial stress thus requiring unique management approaches per region.

**Limitations:**

The Study reveals that young women living in metropolitan areas suffer from PCOS more commonly than women who reside in country regions. The urban participants demonstrated advanced obesity combined with elevated hyperandrogenism as well as insulin resistance yet the rural women exhibited less severe symptoms although they may experience higher psychosocial stress thus requiring unique management approaches per region.

**Future Directions:**

Studying PCOS among broader and larger participants at multiple Study sites can boost the Study validity. Psychological assessments using standardized tests accompanied by long-term follow-up will improve understanding of PCOS's lasting effects on patients. Additional knowledge about genetic and environmental and dietary influences present in different populations will improve personalized treatment approaches.

**Abbreviations:**

1. **PCOS** – Polycystic Ovary Syndrome
2. **BMI** – Body Mass Index
3. **LH** – Luteinizing Hormone
4. **FSH** – Follicle Stimulating Hormone
5. **HOMA-IR** – Homeostasis Model Assessment of Insulin Resistance
6. **PCOM** – Polycystic Ovarian Morphology
7. **SPSS** – Statistical Package for the Social Sciences
8. **SD** – Standard Deviation

**Disclaimer: Nil**
**Conflict of Interest: Nil**
**Funding Disclosure: Nil**

**Authors Contribution**

Concept & Design of Study: **Mujeeb Ur Rehman[1]**
Drafting: **, Irfan Ullah[2], Muhammad Nadeem[3]**
Data Analysis: **Muhammad Hussain Afridi[4]**
Critical Review: **Muhammad Abbas[5], Amjad Ali[6]**
Final Approval of version: **All Mantion Authors Approved the Final Version.**

**Reference**

1. Gupta S, Gupta V, Khan I, Ilya's M. A Hospital-Based Comparative Study of Clinical Profile of Polycystic Ovarian Syndrome in Rural Versus Urban Adolescent Girls. Advances in Human Biology. 2021 May 1;11(2):169-71.

2. Sat apathy SP, Dash R. Assessment of Clinical Profile, Perceptions of Polycystic Ovarian Syndrome & Its Associated Factors among Adolescents Girls Attending O&G OPD. Indian Journal of Public Health Study & Development. 2024 Jan 1;15(1).

3. Das C. Rural-urban comparison of polycystic ovary syndrome in Assam, India: A hospital based cross-sectional study. Online Journal of Health and Allied Sciences. 2023 May 15;22(1).

4. Amira M, Haltom S, Bubals RP, Sheidaei A, Aziz R. The Influence of Study Quality, age, and Geographic Factors on Pecos Prevalence-A Systematic Review and Meta-Analysis. The Journal of Clinical Endocrinology & Metabolism. 2025 Jan 3: dgae917.

5. Mehran TS, Ranfagni H, Kamal's R, Ram U, Angina RM, Mohan V. Prevalence of polycystic ovarian syndrome among adolescents and young women in India. Journal of Dialectology. 2021 Jul 1;12(3):319-25.

6. Ranathunga I, Athukorala TG, Sumanatilleke MR, Somasundaram NP. Evaluation of socio-demographic and clinical characteristics of PCOS patients attending a tertiary care institute in Colombo. BMC Endocrine Disorders. 2022 Nov 21;22(1):289.

**7.** Rafi S, Shah S, Asher A. Clinical profile of patients with polycystic ovary syndrome at tertiary care hospital. Pakistan Journal of Medical & Health Sciences. 2023 Feb 26;17(01):346-.

**8.** Dad S, Khadija S, Jaen F. Comparison Study of Infertility Issues in Rural and Urban Areas. Saudi J Med. 2022;7(1):35-41.

**9.** Majid KH. Prevalence of Polycystic Ovary Syndrome among Women in Rural area and the Outskirts of Baghdad. Journal homepage: https://gjrpublication. com/germs. 2024 May;4(03).

**10.** Gilbert E, Avery J, Bartlett R, Campbell S, Johan A, Rum bold A, Boyle J. The prevalence of clinical characteristics of polycystic ovary syndrome among Indigenous women: A systematic search and review of the literature. In Seminars in Reproductive Medicine 2021 Jul (Vol. 39, No. 03/04, pp. 078-093). Thyme Medical Publishers, Inc.

**11.** Mirza FG, Thala MA, Hazard K, Khakis AH, Atom W. Prevalence of polycystic ovary syndrome amongst females aged between 15 and 45 years at a major women's hospital in Dubai, United Arab Emirates. International Journal of Environmental Study and Public Health. 2023 May 4;20(9):5717.

**12.** Mehdi KA, Kari S, Tonoi TF, Hakeem S, Khandwa YA, Mamnoon S. Polycystic Ovary Syndrome trends: clinical features and associated risk factors among adolescent students. Journal of Rahman Medical Institute. 2024 Oct 7;10(3):21-5.

**13.** Genie MA, Chowdhury S, Suri V, Joshi B, Bhattacharya PK, Agrawal S, Malhotra N, Sahay R, Jabber PK, Rotate R, Wane IA. Prevalence, regional variations, and predictors of overweight, obesity, and hypertension among healthy reproductive-age Indian women: nationwide cross-sectional polycystic ovary syndrome task force study. JMIR Public Health and Surveillance. 2023 Sep 6;9: e43199.

**14.** Kumar N, Agarwal H. Early clinical, biochemical and radiological features in obese and non-obese young women with polycystic ovarian syndrome: a comparative study. Hormone and Metabolic Study. 2022 Sep;54(09):620-4.

**15.** Shringarpure K, Bai R, Sheath M, Patel P, Parmer V, Bai S. Polycystic Ovarian Syndrome among Young Women of a University in Central Gujarat–A Cross-sectional Study. Indian Journal of Public Health. 2023 Oct 1;67(4):575-81.

**16.** Genie MA, Chowdhury S, Suri V, Joshi B, Bhattacharya PK, Agrawal S, Malhotra N, Sahay R, Rotate R, Jabber PK, Srinivas V. Evaluation of the prevalence, regional phenotypic variation, comorbidities, risk factors, and variations in response to different therapeutic modalities among Indian women: proposal for the Indian Council of medical Study–polycystic ovary syndrome (ICMR–PCOS) study. JMIR Study protocols. 2021 Aug 27;10(8): e23437.

**17.** Genie MA, Chowdhury S, Malhotra N, Sahay R, Bhattacharya PK, Agrawal S, Jabber PK, Suri V, Rotate R, Srinivas V, Baba MS. Prevalence, Phenotypes, and Comorbidities of Polycystic Ovary Syndrome Among Indian Women. JAMA Network Open. 2024 Oct 1;7(10):e2440583-.

**18.** Hidaka L, Gasman A, Landan G, Dzivite-Krisane I, Agility L, Viborg I. Can a mother's polycystic ovary syndrome (PCOS)-related symptoms be used to predict the future clinical profile of PCOS in her adolescent daughter? A pilot study. The European Journal of Contraception & Reproductive Health Care. 2021 Jan 2;26(1):17-22.

**19.** Marbaniang RS, Singh YA, Kshetrimayum V, NorAm S, Osyka L. Study of lipid profile in polycystic ovarian syndrome: a case control study in tertiary care hospital. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2023 Dec 1;12(12):3561-6.

**20.** Espinosa ME, Sánchez R, Outzen T, Bautista-Velarize E, Agular S, Corrales-Gutierrez I, Leon-Largos F, Material C. Phenotypic Characterization of Patients with Polycystic Ovary Syndrome in a Population from the Ecuadorian Andes: A Cross-Sectional Study. Journal of Clinical Medicine. 2024 Apr 19;13(8):2376.