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PREVALENCE AND RISK FACTORS OF POLYCYSTIC OVARIAN SYNDROME AMONG PAKISTANI WOMEN

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Abstract

Background: Among women of reproductive age worldwide, polycystic ovarian syndrome (PCOS), a prevalent and complicated endocrine condition, is now the leading cause of irregular menstruation, hyperandrogenism and subfertility. Clinically, PCOS often manifests as irregular or absent menstruation, excessive growth of hair, acne, insulin resistance and obesity

Objective: To determine the prevalence and risk factors of polycystic ovarian syndrome among Pakistani women

Methodology: The current cross-sectional study was carried out at outpatient department of Nawab Sir Sadiq Muhammad Khan Abbasi Hospital, Bahawalpur. The study duration was one year from 1st January 2024 to 31st December 2024. The overall sample size in the current study was 120 based on WHO calculator for sample size. Every participant had a thorough clinical examination that included demographic data, menstrual history, anthropometric measures (weight, height, and BMI), and a modified Ferriman-Gallwey score to quantify hirsutism. SPSS version 24 was used to input all of the data for statistical analysis. Frequencies, percentages, averages, and standard deviations were computed using descriptive statistics. To find correlations between PCOS and possible risk variables, chi-square and independent t-tests were used. P-values below 0.05 were regarded as statistically significant.

Results: In the current study, a total of 120 women were enrolled to determine the prevalence and risk factors associated with PCOS amongst women from south Punjab, Pakistan. The mean age (SD) of the women was 18 (±1.5) years. The mean (SD) BMI (kg/m²) was 24.2±2.84 kg/m². The frequency of overweight (BMI > 25) women was 51 (42.5%). The overall prevalence of PCOS was 28 (23.33%). The mean menstrual cycle length (days) was 41±3.11 days amongst women with PCOS while it was 29±4.01 days amongst women with non-PCOS. We found that prolonged menstrual cycle is significantly associated with PCOS (p=0.003). Amongst PCOS women, Hirsutism was observed in 20 (71.43%) while in non-PCOS women it was observed in 9 (9.8%) which showed more association

with PCOS as compared to non-PCOS women (p=0.001). The different factors like physical inactivity, more consumption of junk food, prolonged use of screen, and poor duration of sleep were significantly associated with PCOS.
Conclusion: Our study concludes that the frequency of PCOS is high in Pakistani Women. Our study also observed a statistically significant association of PCOS with obesity, poor dietary habits and sedentary behavior.

Key words: Prevalence; Risk factors; Polycystic ovarian syndrome

Introduction

Among women of reproductive age worldwide, PCOS, a prevalent and complicated endocrine condition, is now the leading cause of irregular menstruation, hyperandrogenism and subfertility [1]. Clinically, PCOS often manifests as irregular or absent menstruation, excessive growth of hair, acne, insulin resistance and obesity, many tiny ovarian cysts. Although PCOS has long been thought of as an adult disorder, it is now becoming more well acknowledged that it begins in adolescence. Early detection and management of PCOS is crucial because it may result in long-term reproductive, metabolic, and psychological issues such as type 2 diabetes, cardiovascular problems, infertility, depression, and anxiety [2, 3]. The incidence of PCOS varies significantly across nations and ethnic groups, mostly as a result of variations in lifestyle choices, genetic composition, environmental exposures, and diagnostic standards. International estimates place the prevalence of PCOS at between 6%-20% of women, and it is rising in South Asian nations like Pakistan. This increasing tendency has been ascribed to a number of variables, such as the fast pace of urbanization, dietary changes marked by a greater intake of processed and high-calorie foods, a decline in physical activity, and a rise in childhood and teenage obesity. Even though PCOS is quite common in Pakistan, the majority of research has focused on adult women, and little is known about its prevalence and risk factors among adolescents, particularly in rural regions with limited access to healthcare and low reproductive health awareness [4, 5]. Because PCOS may be avoided or postponed throughout adolescence with lifestyle changes, counseling, and pharmacological intervention when necessary, timing of intervention at this time is crucial [6–8]. However, in Pakistan, societal stigma, a lack of knowledge, a lack of screening programs, and a lack of specialized health facilities in rural regions all contribute to the delayed identification of PCOS. To close this disparity, it is necessary to comprehend the prevalence and contributing factors of PCOS in adolescent populations in both urban and rural areas [9–11]. The purpose of the present research was to determine the prevalence of PCOS in Pakistani women living in Bahawalpur and to look at the main clinical, lifestyle, and demographic variables that are linked to its development.

Materials and methods

The current cross-sectional study was carried out at outpatient department of Nawab Sir Sadiq Muhammad Khan Abbasi Hospital, Bahawalpur. The study duration was one year from 1st January 2024 to 31st December 2024. The overall sample size in the current study was 120 based on WHO calculator for sample size. The study approval was taken from the ethical committee of the hospital. The criteria for inclusion were all the women with presentation of menstrual irregularities, hyperandrogenism signs like hirsutism and acne and women suspected for PCOS on the basis of clinical features. The criteria for exclusion were women with known endocrine problems like thyroid dysfunction, Cushing's syndrome and congenital adrenal hyperplasia. Before being included in the research, all participants and their guardians gave their informed written permission. Every participant had a thorough clinical examination that included demographic data, menstrual history, anthropometric measures (weight, height, and BMI), and a modified Ferriman-Gallwey score to quantify hirsutism. There were additional documentation of acne and other hyperandrogenism-related symptoms. Lifestyle-related risk variables, including as eating habits, junk food consumption frequency, levels of physical activity, screen time, and duration of sleep were evaluated using a standardized questionnaire. To assess ovarian morphology, a transabdominal pelvic ultrasound was

carried out. Serum levels of total testosterone, follicle-stimulating hormone (FSH), luteinizing hormone (LH), and fasting insulin were all examined in the lab. Insulin sensitivity was evaluated using the Homeostatic Model Assessment for Insulin Resistance (HOMA-IR). The updated Rotterdam criteria, which require at least two of the following three: polycystic ovarian morphology on ultrasound, clinical or biochemical hyperandrogenism, and oligo/anovulation, were used to diagnose PCOS. SPSS version 24 was used to input all of the data for statistical analysis. Frequencies, percentages, averages, and standard deviations were computed using descriptive statistics. To find correlations between PCOS and possible risk variables, chi-square and independent t-tests were used. P-values below 0.05 were regarded as statistically significant.

Results

In the current study, a total of 120 women were enrolled to determine the prevalence and risk factors associated with PCOS amongst women from south Punjab, Pakistan. The mean age (SD) of the women was 18 (±1.5) years. The age wise distribution shows that 6 (5%) women were <18 years, 98 (81.67%) women were 18-22 years, 12 (10%) women were 23-26 years while 4 (3.33%) women were >26 years of age. (Table 1) The mean (SD) BMI (kg/m²) was 24.2 (2.84) kg/m². The frequency of overweight (BMI > 25) women was 51 (42.5%). The overall prevalence of PCOS was 28 (23.33%). (Table 2) The family history of PCOS was observed in 36 (30%) women. (Table 3) The mean menstrual cycle length (days) was 41 (3.11) days amongst women with PCOS while it was 29 (4.01) days amongst women with non-PCOS (p=0.003). Amongst PCOS women, Hirsutism was observed in 20 (71.43%) while in non-PCOS women it was observed in 9 (9.8%) (p=0.001). Amongst PCOS women, acne was observed in 18 (64.29%) while in non-PCOS women it was observed in 28 (30.43%) (p=0.001). Elevated LH: FSH ratio amongst PCOS women was observed in 23 (82.14%) while in non-PCOS women it was observed in 18 (19.6%) (p=0.007). Insulin Resistance amongst PCOS women was observed in 18 (64.29%) women while it was observed in 18 (19.6%) non-PCOS women (p=0.005). (Figure 1) The different factors like physical inactivity, more consumption of junk food, prolonged use of screen, and poor duration of sleep were significantly associated with PCOS. Physical inactivity was observed in 20 (71.43%) women with PCOS while in non-PCOS women it was observed in 8 (30.43%) participants (p=0.001). The consumption of junk food in PCOS women was observed in 23 (82.14%) while in non-PCOS women it was observed in 45 (49%) (p=0.001). The use of screen for more than 3 hours per day was observed in 18 (64.29%) PCOS women while in non-PCOS women it was observed in 37 (40.21%) women (p=0.003). Sleeping for less than 6 hours per day was observed in 13 (46.43%) women with PCOS while in non-PCOS it was observed in 18 (19.6%) participants (p=0.005). (Figure 2)

Table 1: Age wise distribution of enrolled women

Age	Frequency (%)
<18 years,	6 (5%)
18-22 years	98 (81.67%)
23-26 years	12 (10%)
More than 26 years	4 (3.33%).
Total	120 (100%)

Table 2: Overall prevalence of PCOS amongst enrolled women

Prevalence	Frequency
PCOS	28 (23.33%)
Non-PCOS	92 (76.67%)
Total	120 (100%)

Table 3: Family history of PCOS amongst enrolled women

Prevalence	Frequency
PCOS	36 (30%)
Non-PCOS	84 (70%)
Total	120 (100%)

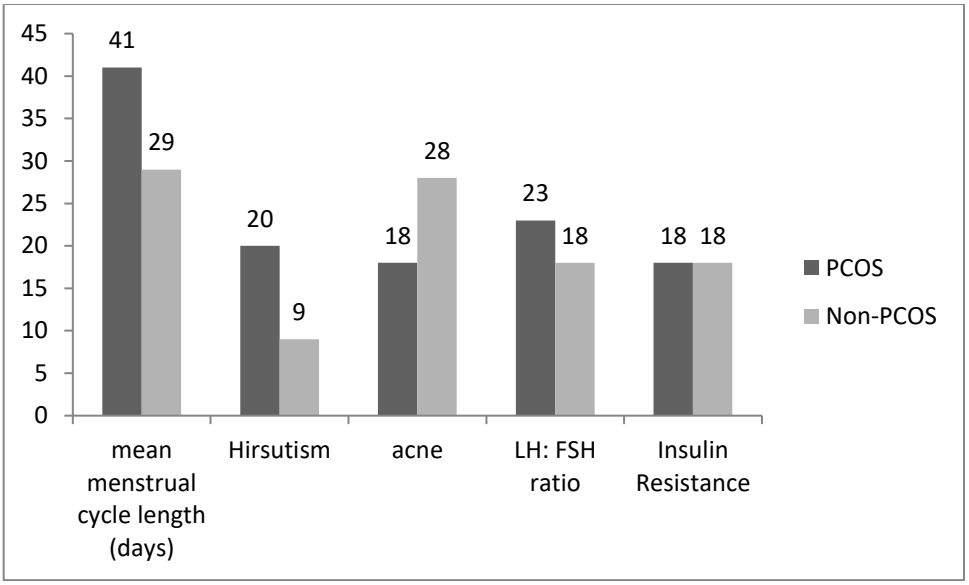

Figure 1: Biochemical and Clinical parameters of the enrolled participants

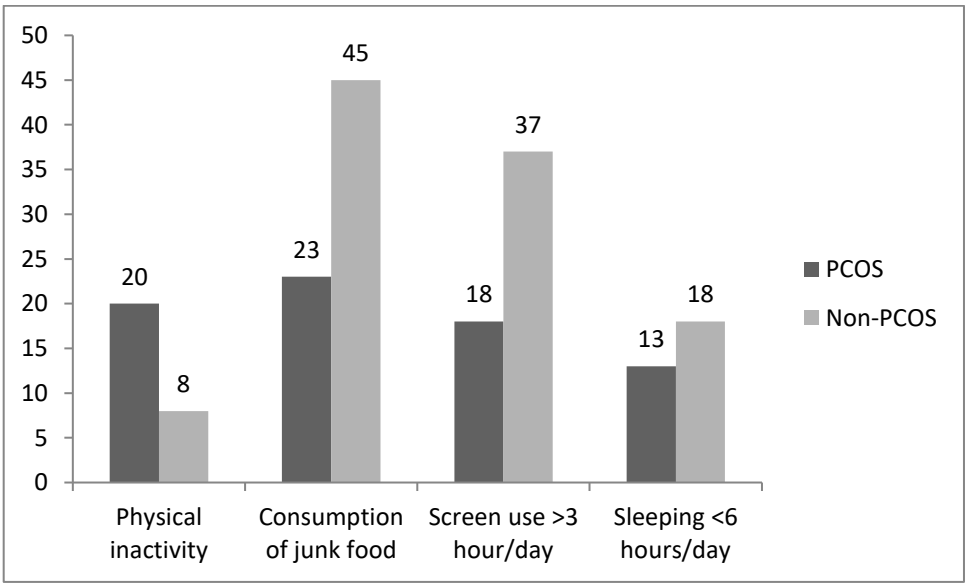

Figure 2: Factors associated with PCOS

Discussion

The current study was carried out to determine the prevalence and risk factors of polycystic ovary syndrome among Pakistani women from Bahawalpur. A total of 120 women were enrolled in the current study. In our study, the overall prevalence of PCOS was 28 (23.33%). These results are consistent with previous regional and Pakistani research that have shown an increasing prevalence of PCOS in teenage populations, especially in urban regions where obesity, nutritional changes, and sedentary lifestyles are more common (12, 13). Our results are in line with research by Nisar and Sohoo, who used same diagnostic criteria to establish a PCOS prevalence of around 28% among teenage females in Sindh, Pakistan (14). The idea that urbanization is linked to higher risk because of lifestyle and environmental variables is also supported by Ahmed et al.'s findings, which showed a

prevalence of 27.3% among urban high school students in Lahore (15, 16). In keeping with the diagnostic standards and pathophysiological processes causing hyperandrogenism, PCOS patients had a much higher prevalence of clinical characteristics such hirsutism, acne, and irregular menstruation. Previous research from Pakistan and other South Asian communities has shown similar trends, highlighting the need of identifying these symptoms in adolescents early to avoid long-term metabolic and reproductive effects (17, 18). In our study the mean menstrual cycle length (days) was 41 (3.11) days amongst women with PCOS while it was 29 (4.01) days amongst women with non-PCOS (p=0.003). Amongst PCOS women, Hirsutism was observed in 71.43% while in non-PCOS women it was observed in 9.8% (p=0.001). Amongst PCOS women, acne was observed in 64.29% while in non-PCOS women it was observed in 30.43% (p=0.001). Elevated LH: FSH ratio amongst PCOS women was observed in 82.14% while in non-PCOS women it was observed in 19.6% (p=0.007). Insulin Resistance amongst PCOS women was observed in 64.29% women while it was observed in 19.6% non-PCOS women (p=0.005). The different factors like physical inactivity, more consumption of junk food, prolonged use of screen, and poor duration of sleep were significantly associated with PCOS. Physical inactivity was observed in 20 (71.43%) women with PCOS while in non-PCOS women it was observed in 8 (30.43%) participants (p=0.001). The consumption of junk food in PCOS women was observed in 82.14% while in non-PCOS women it was observed in 49% (p=0.001). The use of screen for more than 3 hours per day was observed in 64.29% PCOS women while in non-PCOS women it was observed in 40.21% women (p=0.003). Sleeping for less than 6 hours per day was observed in 46.43% women with PCOS while in non-PCOS it was observed in 19.6% participants (p=0.005). The majority of PCOS patients in our research also showed increased insulin resistance (HOMA-IR > 2.5) and LH:FSH ratios, which further supports the metabolic basis of the disease. In our research, we also found significant associations between PCOS and lifestyle behaviors such frequent junk food intake, lack of physical activity, excessive screen time, and poor sleep. Other regional studies have also noted these correlations, such as Asim et al.'s study, which connected the growing prevalence of PCOS amongst teenage girls in urban Punjab to a diet high in fast food and low in physical activity (19). Furthermore, recent research by Fatima et al. emphasised that teens' hormonal disturbance and the development of PCOS are influenced by their sleep habits (20). The observed discrepancy in PCOS prevalence between urban and rural areas may possibly be due to variations in sociocultural norms, health literacy, and access to care. Teenagers in urban areas are more likely to seek medical attention for irregular periods, which increases detection. However, stigma or restricted access to gynaecological treatment may cause rural girls to underreport symptoms (21). This implies that screening and awareness campaigns must to be customised to take these geographical variations into account. Our research highlights the high burden and adjustable nature of risk variables, contributing to the scant literature on PCOS in Pakistani adolescents. The cross-sectional design and sample size of the research, however, restrict its ability to establish cause and effect. To comprehend the course of PCOS and the efficacy of early therapies in the Pakistani population, more extensive, multi-centered, longitudinal studies are necessary.

Conclusion

Our study concludes that the frequency of PCOS is high in Pakistani Women. Our study also observed a statistically significant association of PCOS with obesity, poor dietary habits and sedentary behavior. In order to lessen the burden of PCOS and its long-term health effects, early lifestyle changes, awareness campaigns, and regular screening in primary healthcare and schools might be important suggestions.

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