

Cross Sectional Study of Prevalence, Symptoms and Treatment Preferences for PCOS in Pakistani Medical Students by BMI

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Abstract

Background: Polycystic Ovarian Syndrome is a heterogeneous endocrine disorder that affects an estimated 6–20 % of reproductive-aged women worldwide.

Objectives: To determine the prevalence of PCOS in comparison to BMI, symptoms and treatment modalities preferred by female Pakistani medical students who have suffered from PCOS.

Methods: A pilot exploratory study was conducted in Central Park Medical College, using a non probability convenience sample, from June 2024 to December 2024. A total of 210 students participated in the study and were segregated into three groups based on their BMI: Group 1 (n=45) BMI < 18.5 kg/m², Group 2 (n= 128) BMI 18.51-24.9 kg/m² and Group 3 (n=37) BMI >25 kg/m². Female medical students from MBBS and Department of Physiotherapy, of the age group 18 to 25 years were selected for this study. Data Analysis was carried out using SPSS version 23.0 and the results were calculated.

Results: Out of the 210 participants, 21 had self-reported, clinician-confirmed PCOS (Rotterdam criteria). Of 37 students in Group 3 (BMI > 25 kg/m²), 21 (57 %) had PCOS; of 128 in Group 2, 38 (30 %) had PCOS; of 45 in Group 1, 6 (13 %) had PCOS. It was also observed that signs and symptoms of PCOS were more pronounced in group 3. Group 3 also had a greater history of diabetes mellitus and hypertension.

Conclusion: PCOS is found to be associated with higher BMI. Weight reduction is considered the most efficient treatment modality for PCOS which is believed to help in conception and regulation of menstrual cycle.

Keywords: PCOS, Pakistani Medical Students, Prevalence of PCOS, Symptoms of PCOS, Treatment of PCOS

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Introduction

Polycystic Ovarian Syndrome is a heterogeneous endocrine disorder that affects an estimated 6–20 % of reproductive-aged women worldwide.¹ Despite its various adverse effects on the human body, the chances of its early detection are meager. Most young females show a few PCOS symptoms, like Menstrual Irregularity and Hirsutism, but many women are still unaware of the PCOS condition.¹ Studies have shown that Polycystic Ovarian Syndrome affects several body systems, leading to a variety of health issues such as depression², anxiety³, menstruation disruption⁴, hirsutism⁵, infertility⁶, acne⁷, obesity⁴, and metabolic disorders.⁸ It's also frequently associated with hyperinsulinemia⁹, dyslipidemia⁹, obesity⁹, diabetes type 1⁴, and cardiovascular diseases.^{9, 10} Polycystic ovarian syndrome is diagnosed by hyperandrogenism, insulin resistance¹⁰, persistent anovulation, and ovaries with multiple cysts (The

ultrasound imaging shows 12 or >12 minute globules circumferentially located and/or ovarian volume of more than 10 mL) (Rotterdam consensus 2003)⁹. Although the etiology of polycystic ovarian syndrome is unknown, research suggests that it has a substantial biological basis influenced by genes, lifestyle habits, or both.¹⁰

Not all girls with PCOS get a proper diagnosis, and even if they do get it, it may take several years and multiple specialists to conclude. This could be attributed to a lack of awareness as well as a lack of instructional data available at the appropriate level for women and healthcare professionals. According to one study, more than one-third of PCOS patients have to wait more than two years and see at least three different healthcare practitioners before receiving a diagnosis.¹² Additionally, after being diagnosed, these women received little and often limited information about the long-term consequences of

PCOS, treatment alternatives, and counseling. Women also reported learning about PCOS via internet sites, the quality of which varies. So, there is a strong need to explore all aspects of PCOS knowledge in young females and verify their sources of information. Knowing about all this can help not only women with PCOS but also healthcare professionals.¹²

Since the symptoms of PCOS are often neglected, it is hard to diagnose and treat them. Due to the substantial increase in PCOS cases in recent years, young girls need to know the indicators that require them to get their general medical examination done, association of the disease with their weight and the prevention and treatment options they have to control this syndrome.

This study aims to explore the association between the prevalence and symptoms of PCOS disease and BMI, as well as assess the treatment preferences of young medical students who are suffering from it. The novelty of this study lies in its examination of how academic background and source of health knowledge influence treatment choices. Moreover, this study aims to identify symptoms across different BMI categories to understand better the manifestation of PCOS in underweight, normal weight, and overweight females.

Methods

A cross-sectional pilot study was conducted in Central Park Medical College, from June 2024 to December 2024. This study was approved by the Institutional Review Board of Central Park Medical College under the Serial Number CPMC/IRB-No/1481. Prior written consent of participation was obtained.

A total of 210 Participants were recruited using a non-probability convenience sampling technique from female MBBS and DPT students at Central Park Medical College, Lahore. The sample size was based on an expected prevalence of 10%, confidence level of 95%, and margin of error of 5%. Sample was segregated into three groups based on their BMI: Group 1 (n=45) BMI ≤ 18.5 kg/m², Group 2 (n=128) BMI 18.51-24.9 kg/m² and Group 3 (n=37) BMI ≥ 25 kg/m². Female medical students from MBBS and Department of Physiotherapy, of the age group 18 to 25 years were selected and included in this study.

Participants outside of the age group and male students of Central Park Medical College, Lahore were excluded.

A questionnaire was developed using existing literature on Polycystic Ovarian Syndrome. Its validity was ensured by consulting three consultants in the Gynaecology department at Central Park Teaching Hospital, Lahore, who reviewed the content for clarity, relevance, and comprehensiveness. Internal consistency was acceptable (Cronbach's $\alpha = 0.81$). The questionnaire was pretested on a sample of 25 final-year female medical students at Central Park Medical College, Lahore, to ensure its validity and clarity. Necessary modifications were made using feedback before the final collection of data.

The questionnaire was handed out to the participants that assessed the knowledge of female medical students regarding the symptoms of PCOS, other medical problems associated with the disease, and its treatment. It also examined the attitudes and practices of the participants about appropriate modalities of treatment for PCOS. The first section consisted of questions related to the socio-demographic characteristics and included the participants' age, height and weight, in order to calculate the BMI, and marital status as well as amount of physical activity done daily. The second section included the medical history of Diabetes, Hypertension, and symptoms such as Hirsutism, Acne, Weight gain, menstrual irregularities, as well as family history of Diabetes, Hypertension and PCOS. The third section assessed the knowledge of PCOS, and its treatment, among participants, as well as the source of their knowledge, and the fourth assessed their attitude and practices. The questionnaire was presented in the form of Yes/No questions as well as close-ended multiple choice questions. The questions were kept simple, clear and short to facilitate participants in filling out the form.

Results

The data obtained from the surveys was organized using Microsoft Excel, and the data analysis was conducted using the software Statistical Package for Social Sciences (SPSS) version 23. Statistical significance was set at P value ≤ 0.05 . Relationships between the categorical variables were analyzed

using Chi-square (χ^2) test. Spearman correlation assessed BMI versus symptom count. No multi-variable models were run; this is noted as a limitation. Descriptive statistics were reported as frequencies and percentages. The Chi-square test was used to assess associations between categorical variables. Correlation analysis was applied to explore relationships among continuous variables. A p-value of ≤ 0.05 was considered statistically significant. A total of 210 medical students participated in this study who were segregated into three groups: group 1 (BMI ≤ 18.5), group 2 (BMI 18.51-24.9) and group 3 (BMI > 25) with the mean age of 21.009 ± 1.82 . Figure 1 shows that among all participants, 21 had active polycystic ovary disease. Notably, 57% of group 3 had PCOS, while in group 2, only 30% had PCOS, and in group 1, only 13% had PCOS. This suggests that the frequency of PCOS increases with a rise in BMI, as depicted in Figure 1.

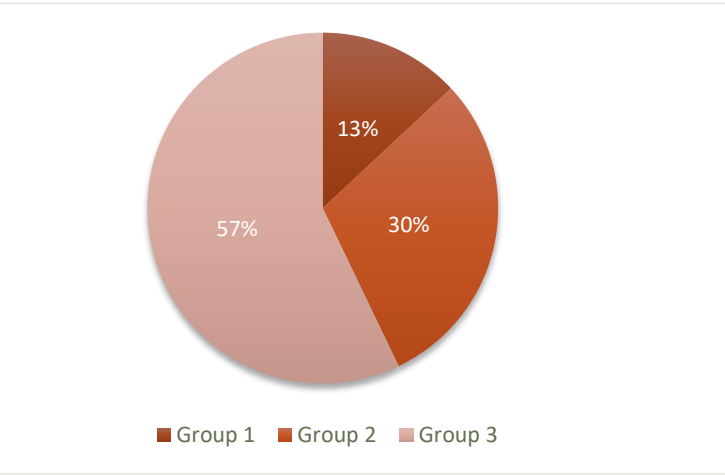


Figure 1: Percentage of Polycystic Diagnosed Cases among Study Groups

Table 1 shows that although the odds ratio suggests higher odds in Group 3, the wide 95 % CI (1.26–37.65) and $p = 0.26$ indicate non-significance. Table 2, an assessment of signs and symptoms by the appliance of a chi-square test among the groups shows that signs of PCOS, including weight gain, hirsutism, acne, dysmenorrhea, and pelvic pain, were more pronounced in group 3 with a significant overall $\chi^2 p = 0.004$ suggestive of higher body mass index is associated with greater severity of disease. On the evaluation of the history of medical ailments, it was found that group 3 has a greater history of diabetes mellitus and hypertension when compared

with other groups with a p-value of .000, suggesting that these medical ailments could have some association with PCOS but at the same time no significant difference among family histories of groups were observed with the p-value of .109 as explained in Table 3.

Table 1: Predication of PCOS Diagnosis Based on BMI

Predictor	Odds Ratio (Confidence Interval=95%)	p-value
Group 2 vs Group 1	1.82 (0.36–9.27)	0.46
Group 3 vs Group 1	6.89 (1.26–37.65)	0.26

Table 2. Comparative Assessment of Clinical Signs of PCOS among Study Groups

Parameter	Numbers & Percentages: n (%)			P value
	Group 1 (BMI ≤ 18.5 ; n=45)	Group 2 (BMI = 18.51-24.9; n=128)	Group 3 (BMI ≥ 25 ; n=37)	
Weight gain/obesity	1 (2.22%)	18 (14.06%)	8 (21.62%)	.004*
Hirsutism	1 (2.22%)	5 (3.91%)	1 (2.7%)	
Acne (oily skin and pimples)	11 (24.44%)	29 (22.66%)	3 (8.11%)	
Irregular menstrual cycles	5 (11.11%)	15 (11.72%)	2 (5.41%)	
Pelvic pain	1 (2.22%)	2 (1.56%)	0	
More than one	13 (28.89%)	47 (36.72%)	20 (54.05%)	
None	13 (28.89%)	12 (9.38%)	2 (5.41%)	

On inquiring about the best treatment methods from study participants of study groups, it was observed that participants, regardless of group, believe in medical management followed by a multisystem approach and then surgical correction, as shown in Figure 2. 173 out of the total participants reported that weight reduction helps in ameliorating symptoms of PCOS, 27 believes this helps in conceiving and 68 thinks it helps in regulating the female reproductive cycle.

It is evident from figure 2, among all participants, 173 (82.4%) believed that weight reduction alleviates symptoms; 27 (12.8%) believed it aids in conception; and 68 (32.4%) believed it regulates the menstrual cycle.

Table 3. Assessment of Histories of Medical Ailments & Family Histories among Study Groups

Histories of Medical Ailments	Numbers & Percentages: n (%)			P value
	Group 1 (BMI ≤ 18.5; n=45)	Group 2 (BMI = 18.51-24.9; n=128)	Group 3 (BMI ≥ 25; n=37)	
Hypertension	4 (8.89%)	17 (13.28%)	5 (13.51%)	< 0.001*
DM	0	0	1 (2.7%)	
Both (HTN & DM)	3 (6.67%)	29 (22.66%)	3 (8.11%)	
None (HTN & DM)	38 (84.44%)	106 (82.81%)	29 (78.38%)	
Family history of Hypertension	5 (11.11%)	22 (17.19%)	4 (10.81%)	.109
Family history of DM	12 (26.67%)	16 (12.5%)	4 (10.81%)	
Family history of Both (HTN & DM)	17 (37.78%)	67 (52.34%)	23 (62.16%)	
Family history of None (HTN & DM)	11 (24.44%)	24 (18.75%)	4 (10.81%)	

Discussion:

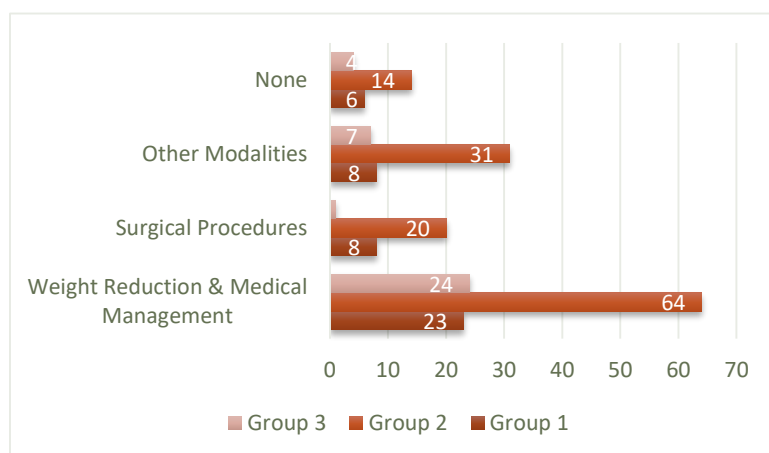
Due to the association of PCOS with a higher BMI than the normal range, weight reduction is often suggested by gynecologists as an effective remedy to control the disease¹³, which aligns with our finding that 82 % of participants endorsed weight reduction has proven very helpful not only in ameliorating symptoms of PCOS but also in regulating menstrual cycles.¹⁴ Weight reduction is also associated with the stabilization of various metabolic systems, including the endocrine, cardiovascular, reproductive, and mood systems.^{15, 16}

Our research is similar to the study by Hussin and Kadir (2020), with the common conclusion that PCOS prevails with many women not being aware of their diagnosis because of their reluctance to see a gynecologist unless they are experiencing severe symptoms.¹¹ The hesitance to see a gynecologist could be due to a lack of awareness of the disease, its management, and medical therapy, which leads to them not receiving treatments, resulting in a variety of potential consequences.

Instead of medicinal interventions for PCOS, including oral contraceptives, metformin, and hormone therapy, studies have proven to alter one's lifestyle to minimize abnormal immune activation and reduce exposure to inflammatory stimuli.¹⁷ Research by Aly & Decherney (2021) claims that 45% of PCOS-affected women have never received guidance for disease and lifestyle management.¹⁸ This suggests the need for a comprehensive approach to seeking information, educational awareness, and counseling at all levels.

Furthermore, PCOS awareness programs and groups provide peer support, evidence-based information, awareness, and advocacy for treatment.¹⁹ Avery et al. (2020) have provided an overview of the latest research on the role of PCOS support groups, claiming that women turn to them for knowledge and emotional support.²⁰ Some support organizations have enduring relationships with medical professionals making significant contributions to public awareness of the disease.²⁰

Our research has several limitations, including the fact that our subjects were female medical students of MBBS and DPT, which suggests that they were more educated about ovarian diseases than the general population. Moreover, this research was conducted

**Figure 2.** Self-reported preferred treatment modalities (multiple responses allowed)

in a Private Medical College setting. Hence, the subjects were more privileged and had greater access to informational resources, such as the Internet and medical books.

Future research can be based on medical examinations of female students who show a few symptoms of PCOS but have never been to a gynecologist for a proper diagnosis. This will give a proper estimate of the prevalence of PCOS in the young population.

The limitations of our study included convenience sampling of one private college, small overweight /obese subgroup, self-reported diagnosis and anthropometry, and absence of blinding. These may limit generalisability and introduce recall bias.

Conclusion:

We have found that PCOS prevalence rose steeply with BMI among Pakistani medical students, yet knowledge gaps and reliance on weight-centred management persist. This study underscores the importance of early detection, targeted education, and lifestyle management to reduce the burden of PCOS in young women. The results of our study can guide institutional health initiatives to raise PCOS awareness among students.

Ethical Permission: The Institutional Ethical & Review Board, Central Park Medical College, Lahore approved this study vide letter No. CPMC/ IRB/-No/ 1481.

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Authors' contribution:

K: Conception & design, acquisition of data, analysis & interpretation, drafting of article, final approval

SA, MI: Conception & design, acquisition of data

TH: Acquisition of data, analysis & interpretation

LR: Analysis & interpretation

MZS: Final approval of the version to be published

References

1. Anjum N, Naz S, Rehman A. A community based cross sectional study on prevalence of polycystic ovarian syndrome (PCOS) and health related quality of life in Pakistani females. *Elementary Education Online* 2021; 20 (6): 141-7.

2. Cooney LG, Dokras A. Depression and Anxiety in Polycystic Ovarian Syndrome: Etiology and Treatment. *Curr Psychiatry Rep.* 2017;19(11):83. doi: 10.1007/s11920-017-0834-2.
3. Dokras A. Mood and anxiety disorders in women with PCOS. *Steroids.* 2012;77(4):338-41. doi: 10.1016/j.steroids.2011.12.008.
4. Thong EP, Milat F, Joham AE, Mishra GD, Teede H. Obesity, menstrual irregularity and Polycystic Ovarian Syndrome in young women with type 1 diabetes: A population-based study. *Clinical Endocrinology.* 2020;93(5):564-71.
5. Spritzer PM, Barone CR, Oliveira FB. Hirsutism in Polycystic Ovarian Syndrome: Pathophysiology and Management. *Curr Pharm Des.* 2016;22(36):5603-5613. doi: 10.2174/1381612822666160720151243.
6. Deshpande PS, Gupta AS. Causes and prevalence of factors causing infertility in a public health facility. *J Hum Reprod Sci* 2019;12(4):287.
7. Begum S, Hossain MZ, Rahman MF, Banu LA. Polycystic ovarian syndrome in women with acne. *J Pak Assoc Dermatol* 2017;22(1):24-9.
8. Condorelli RA, Calogero AE, Di Mauro M, Cannarella R, Rosta G, La Vignera S. Androgen excess and metabolic disorders in women with PCOS: beyond the body mass index. *J Endocrinol Invest* 2018;41(4):383-8.
9. Bednarska S, Siejka A. The pathogenesis and treatment of Polycystic Ovarian Syndrome: What's new. *Adv Clin Exp Med.* 2017;26(2):359-67.
10. Norman RJ, Dewailly D, Legro RS, & Hickey TE. Polycystic Ovarian Syndrome. *Lancet.* 2007. 370(9588), 685–697.
11. Hussin SN, Abd Kadir NH. A Study On Knowledge, Attitude And Perception Of Polycystic Ovarian Syndrome (Pcos) Among Young Students In Higher Educational Institutions, Perak. *J Soc Sci Adv Res* 2020;1(2):160-81.
12. Gibson-Helm M, Teede H, Dunaif A, Dokras A. Delayed diagnosis and a lack of information associated with dissatisfaction in women with Polycystic Ovarian Syndrome. *J Clin Endocrinol Metab* 2017;102(2):604-12.
13. Cussons AJ, Stuckey BG, Walsh JP, Burke V, Norman RJ. Polycystic ovarian syndrome: marked differences between endocrinologists and gynaecologists in diagnosis and management. *Clin Endocrinol* 2005;62(3):289-95.
14. Dokras A, Sarwer DB, Allison KC, Milman L, Kris-Etherton PM, Kunselman AR, et al. Weight loss and lowering androgens predict improvements in health-related quality of life in women with PCOS. *J Clin Endocrinol Metab* 2016;101(8):2966-74.
15. Ozgen Saydam B, Yildiz BO. Weight management strategies for patients with PCOS: current

- perspectives. *Expert Rev Endocrinol Metab* 2021 ;16(2):49-62.
16. Hazlehurst JM, Singh P, Bhogal G, Broughton S, Tahrani AA. How to manage weight loss in women with obesity and PCOS seeking fertility? *Clin Endocrinol* 2022; 97(2):208-216
17. Khan MJ, Ullah A, Basit S. Genetic basis of Polycystic Ovarian Syndrome (PCOS): current perspectives. *Appl Clin Genet* 2019;12:249.
18. Aly JM, Decherney AH. Lifestyle modifications in PCOS. *Clin Obstet Gynaecol* 2021;64(1):83-9.
19. Jena SK, Mishra L, Naik SS, Khan S. Awareness and opinion about polycystic ovarian syndrome (PCOS) among young women: a developing country perspective. *Int J Adolesc Med Health* 2021;33(3):123-6.
20. Avery J, Ottey S, Morman R, Cree-Green M, Gibson-Helm M. Polycystic Ovarian Syndrome support groups and their role in awareness, advocacy and peer support: a systematic search and narrative review. *Curr. Opin. Endocr. Metab. Res* 2020;12:98-104.



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