

## **Prevalence and Risk Factors of Polycystic Ovary Syndrome in Punjab**

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*PCOS*, a hormonal illness, affects women globally. The present study was designed to investigate the diverse aspect of *PCOS* among women in Punjab. This study determined the prevalence of (*PCOS*) among different age groups and its effects on females. A descriptive cross-sectional study with a non-probability purposive sampling strategy was used for investigation. The sample comprised of ( $N=150$ ) women with polycystic ovary with an age range of 20-28 years. Demographic Information Sheet and Self-Constructed (*PCOS*) dichotomous survey scales were used. Using an established questionnaire, the study collected facts from a various group of ladies in Punjab, drawing contributors from hospitals, online affected person groups, and specialized healthcare centers. The results showed that *PCOS* was more common in relatively younger women in their 20s. Genetic factors were not found to be associated with *PCOS* in the women of Punjab. *PCOS* can cause mental (hypertension) as well as physical (hair loss, oily skin) damage to individuals. The present study implicates the need for increased awareness and education programs related to (*PCOS*) and the importance of diet and exercise for overcoming this disease. Considering the findings, health professionals need to focus on and delves into awareness levels, coping strategies, psychological health, academic tasks, prevalence factors, and risk factors associated with *PCOS*.

**Keywords:** Disease, *PCOS*, Prevalence, Diagnostics, Treatment and Management

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### Introduction

PCOS is a complicated and difficult condition characterized by elevated androgen levels, abnormal menstrual cycles, and the presence of small cysts on one or each ovaries. The manifestations of PCOS can occur morphologically as polycystic ovaries or biochemically through hyperandrogenemia. *PCOS* (polycystic ovarian syndrome) was originally reported in 1935 (Delcour et al., 2019). Elevated androgen levels, a prominent characteristic of (*PCOS*), can impede follicle development, contribute to the formation of tiny cysts in the ovaries, disrupt the ovulation process and result in menstrual irregularities (Ayon et al., 2023). Hyperandrogenism refers to a medical condition characterized by excessive levels of male sex hormones, known as androgens, in the body. While androgens are present in both males and females, their quantities differ. In women, hyperandrogenism can disturb hormonal equilibrium and lead to various clinical manifestations (Zeng et al., 2020).

Hyperandrogenism can originate from various underlying causes, with one of the most prevalent being polycystic ovary syndrome (PCOS). In (*PCOS*), elevated levels of androgens in the body contribute to characteristic symptoms like hirsutism (excessive hair growth), acne, and irregular menstrual cycles (Kanbour & Dobs, 2022). Nevertheless, it is crucial to acknowledge that hyperandrogenism can arise due to various causes, including conditions affecting the adrenal glands such as congenital adrenal hyperplasia (CAH) or adrenal tumors, specific medications, and rare genetic disorders (Armanini et al., 2022).

The symptoms of hyperandrogenism can vary according to the specific cause and individual factors. In addition to hirsutism and acne, other signs of clitoromegaly include androgenic alopecia (male pattern hair loss), deepening of the voice, increased muscle mass, and clitoromegaly (enlarged clitoris). It is worth noting that hyperandrogenism can be linked with metabolic disruptions, including insulin resistance and obesity, thereby augmenting the complexity of the condition (Ethirajulu et al., 2021).

Overall, hyperandrogenism can have diverse origins and manifestations, with (*PCOS*) being a prominent cause. Ovarian hyperthecosis (OH) is characterized by hyperandrogenism symptoms and is frequently referred to as a severe or extreme variant of Polycystic Ovary Syndrome (*PCOS*) (Meczekalski et al., 2021). Diagnosis of hyperandrogenism requires a comprehensive clinical assessment, which comprises a review of medical records and a comprehensive physical examination. Hormonal levels, including aggregate testosterone,

independent testosterone, and dehydroepiandrosterone sulfate (DHEAS), are conventionally evaluated using hematological analyses. Additional tests, such as imaging studies or genetic testing may be performed to identify the underlying cause (Soares et al., 2019).

The treatment approach for hyperandrogenism should be tailored to the underlying cause and individual needs. In the case of (*PCOS*), lifestyle modifications are often recommended as the initial step. Incorporating a nutritious diet and regular exercise, which can aid in weight loss, is beneficial because they promote hormonal balance and alleviate symptoms (Teede et al., 2018).

### **Rationale**

There has been growing concern about the prevalence of (*PCOS*) among different age groups and its impact on females. Elevated androgen levels, a prominent characteristic of (*PCOS*), can impede follicle development, contribute to the formation of tiny cysts in the ovaries, disrupt the ovulation process and result in menstrual irregularities (Ayon et al., 2023). Hyperandrogenism can stem from various underlying causes, with one of the most prevalent being Polycystic ovary syndrome (*PCOS*) as well hyperandrogenism can have diverse origins and manifestations, with (*PCOS*) being a prominent cause. In (*PCOS*), the elevated levels of androgens in the body contribute to characteristic symptoms like hirsutism (excessive hair growth), acne, irregular menstrual cycles, deepening of the voice, increased muscle mass, and clitoromegaly (enlarged clitoris). (Kanbour & Dobs, 2022). It is worthy to take note that hyperandrogenism can be linked with metabolic disruptions, including insulin resistance and obesity, thereby augmenting the complexity of the condition (Ethirajulu et al., 2021). In the context of Pakistan, genetic predisposition and unhealthy lifestyle patterns are potential risk factors. The present study focused on prevalence facts, risk factors and health impacts associated with *PCOS*, delves into awareness levels, coping strategies, psychological health, academic tasks and lifestyle modifications as the initial step. Incorporating a nutritious diet and regular exercise, which can aid in weight loss, is beneficial because they promote hormonal balance and alleviate symptoms (Teede et al., 2018).

### **Objectives of the Study**

1. To determine prevalence of Polycystic Ovary Syndrome (*PCOS*) among women in the Punjab.
2. To identify potential risk factors associated with *PCOS* occurrence in this population.
3. To study the health impacts of *PCOS*.

## Method

### Research Design

This study used a descriptive cross-sectional research design to determine the prevalence of (*PCOS*) among different age groups and its effects on females.

### Sample

The sample consisted of ( $N=150$ ) women with the most common age of (20 to 28) years suffering from polycystic ovary syndrome. The study subjects were selected from the University of the Punjab, Gynecology Outpatient Department (OPD) of Lady Willingdon Hospital, Jinnah Hospital, Lahore, Pakistan, between November 2022 to April 2023.

**Inclusion criteria.** The participants were included based on the following criteria: (i) clinical or biochemical hyperandrogenism, (ii) evidence of oligoanovulation, (iii) polycystic appearing-ovarian morphology on ultrasound.

**Exclusion criteria.** (i) Participants were screened out those have hyperandrogenic state with oligo-anovulation that can be explained by any other relevant disorder, (ii) Those with a diagnosis of psychological disorder as well currently on any medication and unable to participate in the study effectively.

### Demographics of the Study Population

It was found that PCOS was most common among females of 20-28 years. If talk about the marital status of the study population, then most of the population was married.

### Measures

A self-constructed dichotomous survey scale for Polycystic Ovary Syndrome (*PCOS*) on the basis of previous literature was used. Questionnaire describing important information about the parameter that were used in the tool was age, marital status, occupation, current health condition, regularity of cycle extension of menstrual cycle, skin type, hair loss experience, awareness information about treatment complications, sleep cycle, living style, anxiety level, weight fluctuation, unwanted hair growth menstruation regularity, discoloration of neck, mood fluctuation, hypertension, medical contraception usage maternal-history, management of disease gynecologist guidance, confirmation of disease and diet control.

### Procedure

The study subjects were selected from the University of the Punjab, Gynecology Outpatient Department (OPD) of Lady Willingdon Hospital, Jinnah Hospital, Lahore, Pakistan, between November 2022 to April 2023. These public sector hospitals and diagnostic center were selected for

sample collection because they bear the highest load of patients from Lahore and its outskirts. Participants signed a consent form with information regarding each step of the study. Written informed consent for participants aged below 16 years was obtained from their parents or guardians. Ethical approval for the study was obtained from the Ethical Review Board of IMMIG, University of the Punjab.

A survey was conducted among women affected by PCOS who experienced menarche. The questionnaire was self-constructed on the basis of previous literature that described important information about PCOS. The parameters that were used in the questionnaire were age, marital status, occupation, current health condition, regularity of cycle extension of menstrual cycle, skin type, hair loss experience, awareness information about treatment complications, sleep cycle, living style, anxiety level, weight fluctuation, unwanted hair growth menstruation regularity, discoloration of neck, mood fluctuation, hypertension, medical contraception usage maternal history, management of disease gynecologist guidance, confirmation of disease and diet control. A dichotomous survey scale was used. The administration procedure was conducted following detailed guidelines. All participants were given forms and informed about the nature of study and were told that they have the right to withdraw from the study at any time.

### **Ethical Considerations**

The following ethical considerations were maintained in order to conduct the study. Permission for the research was obtained from the Ethical Review Board of IMMIG, University of the Punjab. Informed consent was taken from the participant. Permission was sought from the parents of the participants. Minimal risk to the participant was assured. Confidentiality of the participant was maintained. Participants were informed about the research objectives. The results were reported without any biases. It was assumed that results will only be used for research purposes. It was assumed that data would not be shared with anyone. Researcher and supervisor had access to the data.

### **Results**

The present research was conducted with the aim to assessing the prevalence facts, risk factors and impact of (PCOS) on health among different age group females. Different demographic and clinical parameters were examined in the study to found the risk factors of PCOS that included age, marital status, occupation, current health condition, regularity of cycle extension of menstrual cycle, skin type, hair loss experience, awareness information about treatment complications, sleep

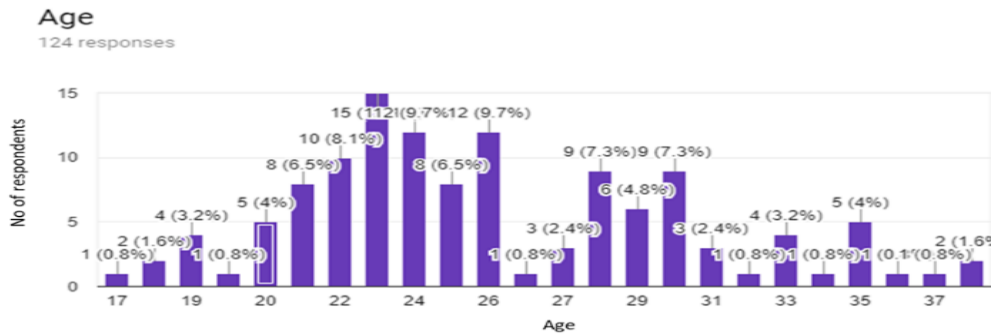
cycle, living style, anxiety level , weight fluctuation, unwanted hair growth menstruation regularity, discoloration of neck, mood fluctuation, hypertension, medical contraception usage, maternal history, management of disease gynecologist guidance, confirmation of disease and diet control.

**Demographic Factors of the Study Population**

The demographic risk factors that were discovered in the study were age, marital status and awareness regarding treatment complications.

**Figure 1.**

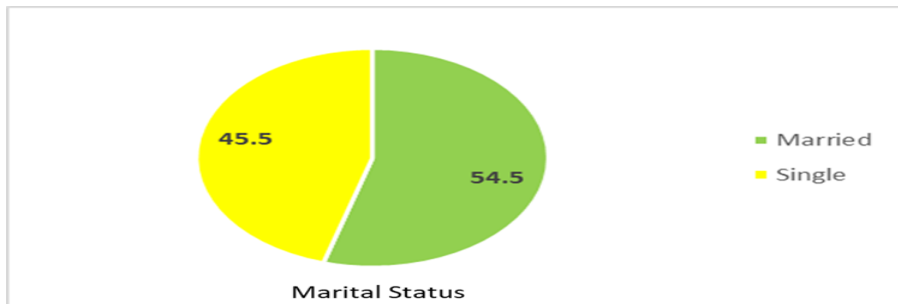
Effect of Age on PCOS Patients



The most common age at diagnosis of polycystic ovary syndrome in Pakistan females was (20 to 28) years.

**Figure 2.**

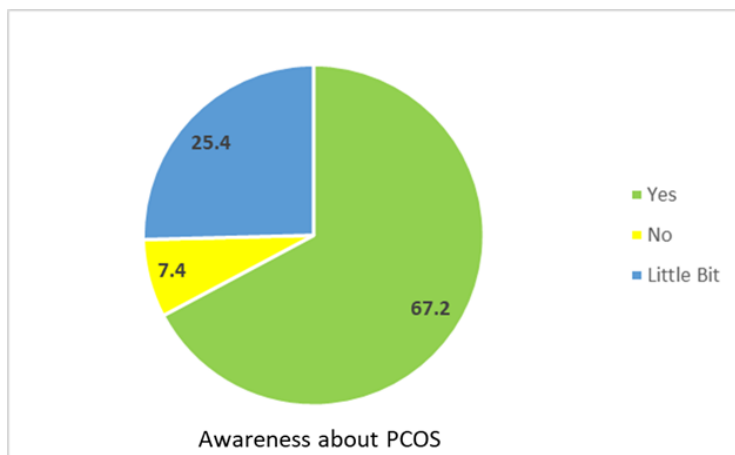
Marital Status of Patients with PCOS



Further demographic analysis of the study population showed that most of the population was married.

**Figure 3.**

Awareness about PCOS among Patients

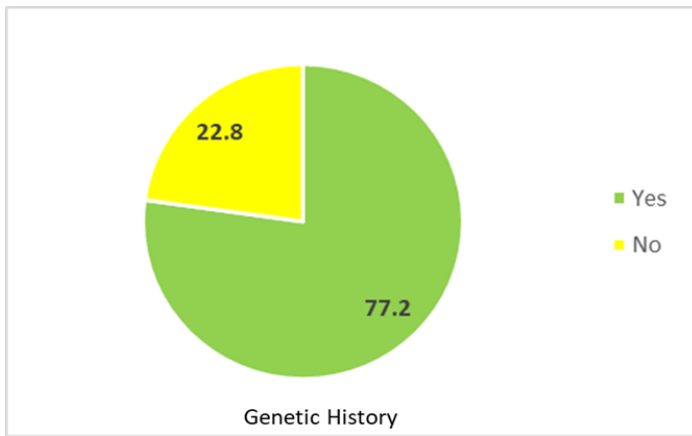


Instead of suffering from the disease, the awareness between the patients was not significant. Only 67.2 % of the patients were found to have awareness

### **Clinical Factors of the Study Population**

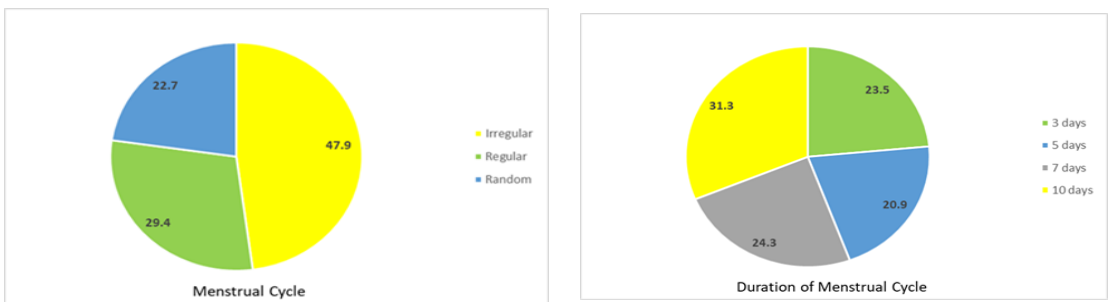
The clinical risk factors that were assessed in the study were genetic history regularity of cycle extension of menstrual cycle, skin type, hair loss experience, PCOS impacts on health included (sleep cycle, living style, anxiety level, weight fluctuation, unwanted hair growth menstruation regularity, discoloration of neck, mood fluctuation, hypertension, medical contraception usage maternal history, management of disease gynecologist guidance, confirmation of disease and diet control).

**Figure 4.**  
Genetic History of Patients with PCOS



According to maternal history, 77.2% of female's mother do not suffer from this condition indicating that it is not a genetic disease and 14.6% of patients mother also suffered from the same condition.

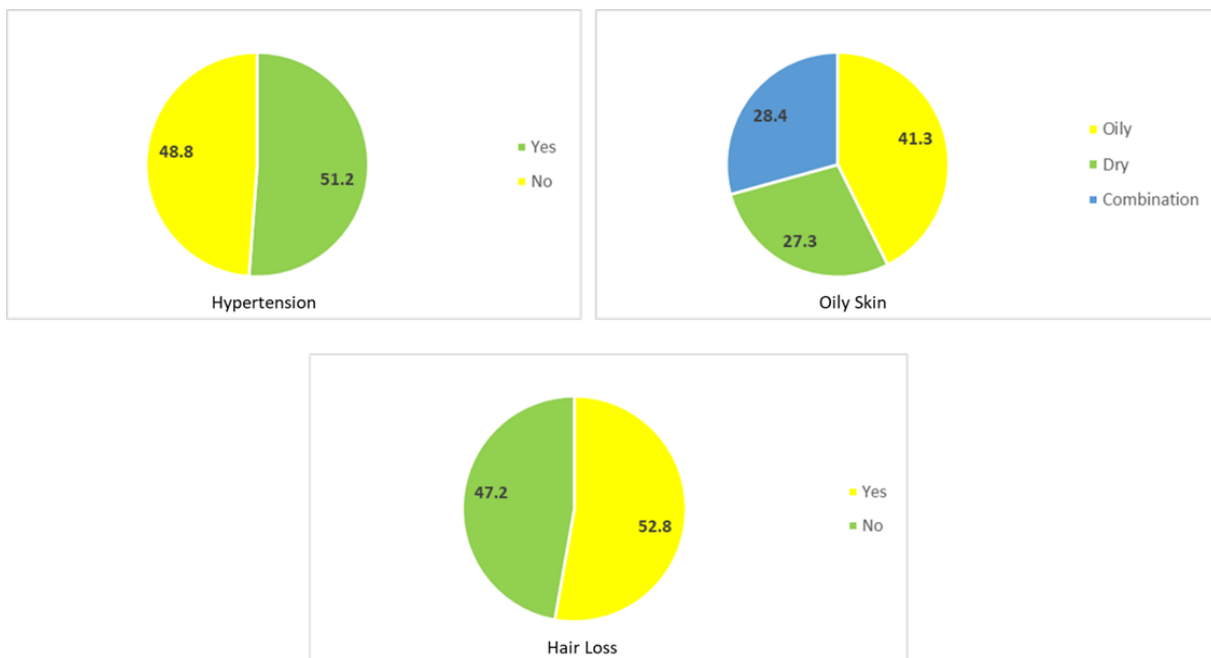
**Figure 5.**  
Menstrual History of Patients with PCOS



According to a survey about the regularity of menstrual cycle was not seen among the patients, with a percentage of 47.9% having irregular cycle and 29.4% female having regular cycle and this is due to formation of cyst in uterus which causes delay in the regular monthly cycle (Figure 5). Then, extension of menstrual cycle was 3 days in 23.5%, 5 days in 20.9%, 7 days in 24.3% and 10 days in 31.3% according to the survey.



**Figure 6.**  
PCOS Impacts on Health (Mental and Physical Damage)



Google docs analysis of data regarding the main parameter of the survey i.e. the presence of hypertension in the females suffering was more about 51.2% and the female did not have hypertension was 48.8%. As per the symptoms skin type was also discussed showing that 41.3% had oily skin and 27.3% had dry skin and 28.1% had a combination of skin. It was also observed that patient with this disease also suffer from hair loss (About 52.8% of study population)

### Discussion

The cross-sectional study was conducted on a population of 150 women suffering from Polycystic Ovary Syndrome (PCOS) and aimed to determine the prevalence of (PCOS) among different age groups and its effects on females. The study was conducted over a two-month period from March 2021 to April 2022.

The results of the study indicated that (PCOS) was most common among women aged 20-28 years. This age group had the highest incidence of the disease, suggesting that it may have a greater impact on younger women. It is important to note that (PCOS) predominantly affects females, as observed in this study and is consistent with existing knowledge. Regarding maternal history, the study found that a majority (77.2%) of the

female patients' mothers did not suffer from (*PCOS*). This suggests that (*PCOS*) is not solely a genetic disease, as only a small percentage (14.6%) of patients had mothers who also experienced the condition. This finding aligns with previous research that supported the role of genetics in the etiology of (*PCOS*), including familial aggregation and genomic identification of (*PCOS*)-susceptibility loci.

The study also examined the presence of hypertension in the female patients with (*PCOS*). It was observed that 51.2% of the patients had hypertension, whereas 48.8% did not. The higher prevalence of hypertension in (*PCOS*) patients may be attributed to familial aggregation and genetic factors, as mentioned in previous studies. The regularity of menstrual cycles was assessed in the study, and 47.9% of the patients had irregular cycles. This irregularity may be due to the formation of cysts in the uterus, which can delay the regular monthly cycle. The study also revealed that the duration of menstrual cycles varied among the patients, with 23.5%, 20.9%, 24.3%, and 31.3% reporting a menstrual cycle extension of 3 days, 5 days, 7 days, and 10 days, respectively.

Skin type and hair loss symptoms were also assessed in the study. It was observed that 41.3% of the patients had oily skin, 27.3% did not have oily skin, and 28.1% reported having combination skin. Furthermore, 52.8% of patients experienced hair loss. These findings highlight the dermatological manifestations associated with (*PCOS*), such as oily skin and hair loss, which can contribute to the overall symptomatology of the condition.

### **Conclusion**

The comprehensive survey-based study on psychological well-being, coping mechanisms, awareness, education programs, prevalence, and risk factors of Polycystic ovary syndrome (*PCOS*) among working and non-working women in Punjab has provided valuable insights.

First, the study revealed that (*PCOS*) has a significant impact on the psychological well-being of affected women. The participants reported higher levels of anxiety, mood fluctuations, and stress associated with their (*PCOS*) diagnosis. This finding highlights the importance of addressing the psychological aspects of (*PCOS*) management to improve the overall quality of life of women with *PCOS*.

Second, the study sheds light on the coping mechanisms employed by women with (*PCOS*). Various strategies, such as engaging in physical activity, adopting healthy lifestyle habits, seeking social support, and participating in educational programs, were identified as effective coping mechanisms. These findings emphasize the importance of implementing

comprehensive support programs that address coping skills and resilience in women with (*PCOS*).

Third, the study highlighted the need for increased awareness and education programs related to (*PCOS*). Many participants expressed a lack of knowledge about their condition, symptoms, and available treatment options. This underscores the importance of developing targeted educational initiatives to enhance (*PCOS*) awareness among both healthcare professionals and the general population. Furthermore, the study provided insights into the prevalence and risk factors of (*PCOS*) among working and non-working women in Punjab. The survey results indicated a considerable prevalence of (*PCOS*) among the study population, emphasizing the need for early detection, diagnosis, and management strategies. The identification of risk factors, such as obesity, hormonal imbalances, and family history of (*PCOS*) will aid in the development of preventive measures and tailored interventions.

Overall, the findings of this comprehensive study highlight the multi-faceted nature of (*PCOS*) and its impact on various aspects of women's lives. This study underscores the significance of addressing psychological well-being, implementing effective coping mechanisms, increasing awareness and education programs, and understanding the prevalence and risk factors of (*PCOS*) to improve the overall management and outcomes of women affected by this condition. The prevalence of Polycystic Ovary Syndrome (*PCOS*) among Emirati women was high in this study. Additionally, this research revealed a significant association between earlier life conditions, such as asthma and high cholesterol and the development of (*PCOS*) later in life. This bi-directional relationship between chronic disease conditions and (*PCOS*) suggests the need for improved surveillance of chronic diseases among women with (*PCOS*) and the implementation of targeted prevention strategies. The high prevalence of (*PCOS*) among Emirati women highlights the importance of early detection and management to mitigate its potential long-term health effects. By identifying and addressing risk factors, such as asthma and high cholesterol level, earlier in life, healthcare professionals can reduce the incidence of (*PCOS*) and its associated complications.

### **Limitations and Suggestions**

- **Sample Size and Representation:** The have a look at sample length may not completely represent the complete population of Punjab, which can restrict the generalizability of the findings. The various sample from different sectors increased generalizability.

- **Sampling Bias:** There is probably a bias within the selection of participants, which includes relying totally on health center-based facts that will not, reflect the prevalence within the network. Probability (Random sampling) can protect against biased samples.
- **Data Collection Methods:** Reliance on self-reported records may introduce self-intention bias or subjective interpretations, affecting the accuracy of the mentioned data.
- **Risk Factor Identification:** Certain danger elements might not have been captured or explored comprehensively because of barriers in data collection strategies or the scope of the have a look at.
- **Cross-sectional Study Design:** The study could have been go-sectional, limiting the capability to establish causality between threat elements and PCOS improvement. Longitudinal studies or population studies in the different time periods can help to establish causality.
- **Response Rate and Missing Data:** A low reaction fee or lack of facts within the have a look at should introduce biases and affect the completeness of the analysis.

### Implications

This present research makes a contribution to the fields of social, medical and psychology. The present research also provides us with potential risk factors, prevalence and major (mental and physical) impact of (*PCOS*) in Pakistani women. The present study implicates the need for increased awareness and education programs related to (*PCOS*) and the importance of diet and exercise for overcoming this disease. Study will help health professionals focus and delves into awareness levels, coping strategies, psychological health, academic tasks and avoid the prevalence facts and risk factors associated with PCOS.

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