# Prevalence of Infertility among Young Women with Polycystic Ovarian Syndrome (PCOS)

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## ABSTRACT

**Background:** Polycystic ovarian syndrome (PCOS) is the most common cause of infertility among young women trying to conceive. Most of the times due to lack of awareness, women remain undiagnosed and unable to seek treatment at young age when the success rates of conceiving are higher. **Objective:** To determine the true prevalence of infertile young women diagnosed with PCOS. **Study Design:** Prospective study. **Settings:** Department of Gynecology and obstetrics, Ghulam Muhammad Mahar Medical College, Sukkur Pakistan. **Duration:** July 2022 to June, 2023. **Methods:** All young women (18 years – 35 years) diagnosed as PCOS, and failure to conceive for more than 1 year were included for this study. Data were collected regarding baseline and clinical characteristics. Outcome variable was presence or absence of infertility among young women with PCOS. **Results:** Final analysis was performed on 124 young women diagnosed with polycystic ovarian syndrome. The mean age and standard deviation was 27.84 ± 4.21 years and BMI was 25.14 ± 6.33 kg/m². More than 80% of women were housewives (n = 101) and had lower socioeconomic background, 60.48% (n = 75). The prevalence of infertility was 62.90% (n = 78) and 37.09% (n = 46) did not have infertility. Infertility was more common among young women with higher mean age (26.34 ± 2.67 years), higher BMI (26.34 ± 2.67 kg/m²), and women addicted to chewable tobacco, p value <0.05. **Conclusion:** Higher infertility rate is observed among young women diagnosed with polycystic ovarian syndrome. Fertility rate can be increased among such women by providing awareness regarding the disease and treatment plan.

*Keywords: Polycystic ovarian syndrome, Infertility, Young women, Pakistan.*

## INTRODUCTION

Infertility among young women is the common presentation gynecologists encounter during their routine practice, mostly married women who unable to conceive after 12 months of unprotected intercourse.[1] A systemic review and meta-analysis conducted by Hazlina NHN[2] and colleagues to determine the world-wide prevalence of infertility among young women have observed primary infertility more prevalent (51.5%) than secondary infertility (46.25%). But, this prevalence is lower in Chinese women (24.58%, secondary infertility vs. 6.54%, primary infertility).[3] In Pakistan, overall prevalence of infertility was 22%, of which, 4% had primary while 18% had secondary infertility.[4]

Multiple causes are accountable for causing primary and secondary infertility. Young women with secondary infertility usually have polycystic ovarian syndrome (PCOS) and accounts for around 44%.[5] Treatment is immediately recommended after the disease is diagnosed so the success rate should be maximized. Conception among such patients can be achieved through treatment from oral medications or if unsuccessful, then invasive procedures.[6] In a study conducted by Pritts EA[7] who started Clomiphene citrate among young women with

PCOS and observed initiation of menstrual cycle among 70-80% of women and among them 22% conceived successfully.

Early diagnosis of infertility among young women with PCOS prevents them from psycho-social stress, financial burden, and other disease related complications. That is why this study aims to determine the true burden of infertility among young women diagnosed with PCOS.

## METHODS

This prospective study was conducted in the Department of Gynecology & Obstetrics, P Department of Gynecology and obstetrics, Ghulam Muhammad Mahar Medical College Sukkur, from July 2022 to June, 2023. Sample size for this study was calculated through Solvin's formula and a total of 124 young women with PCOS were selected through a convenience sampling technique. The inclusion criteria for this was young women age between 18 years to 35 years, diagnosed as polycystic ovarian syndrome, and trying to conceive for more than 6 months. The exclusion criteria for this study was women's age more than 35 years, primary infertility, male infertility, infertility caused by other than PCOS, chronic liver, kidney, or lung disease, type 1 diabetes mellitus, and those who do not consent to participate.

The various symptoms and signs related to PCOS have now been extensively evaluated as to their possible contribution to the diagnosis. Consensus has been reached for the use of oligomenorrhea or amenorrhea, clinical or biochemical hyperandrogenism, and polycystic ovaries at ultrasound as key diagnostic criteria.[8] Secondary infertility will be diagnosed among young women who are unable to conceive due to PCOS after 1 years of non-protected sexual intercourse.

A consent will be sought from all study participants before inclusion in the study and ethical approval from the institution will also be taken before commencement of data. A structured questionnaire was designed to collect the data regarding baseline and demographic characteristics such as age, education status, body mass index (BMI), area of residence, occupation (house wife, labor work, executive job), socioeconomic class, addiction habit, level of education, duration of marriage, frequency of infertility (yes/no).

Statistical package for the social sciences (SPSS v. 26.0) was used for data entry and analysis. Frequencies & percentages were calculated for categorical variables while means with standard deviation were calculated for quantitative variables. Outcome variables (infertility among young women with PCOS) were presented in the form of frequency and percentage and comparison with effect modifiers were done and level of significance was obtained at levels of 0.05.

## RESULTS

Final analysis was performed on 124 young women diagnosed with polycystic ovarian syndrome. At the time of inclusion in this study, the women's mean age and standard deviation was 27.84±4.21 years. Also, most of the women were fall under overweight category of BMI (25.14±6.33 kg/m²). Most of the study participants were resident of urban area as compared to rural, 70.96% (n = 88) vs. 29.03% (n = 36), respectively. More than 80% of women were housewives (n = 101) and had lower socioeconomic background, 60.48% (n = 75). Frequency of chewable tobacco use was more prevalent than current smokers, 33.87% and 4.83%. Infertility was more common among young women with higher mean age (26.34±2.67 years), higher BMI (26.34±2.67 kg/m²), and women addicted to chewable tobacco, p value <0.05. Table 1.

**Table 1: Association of baseline and clinical characteristics among infertile young women with PCOS (N = 124)**

| Variables | Overall | PCOS | | p value |
|---|---|---|---|---|
| | (N = 124) | Yes | No | |
| | | (N = 78) | (N = 46) | |
| | Mean ± SD | Mean ± SD | | |
| Age – years | 27.84 ± 4.21 | 26.34 ± 2.67 | 23.04 ± 6.22 | **0.001** |
| BMI - kg/m2 | 25.14 ± 6.33 | 26.77 ± 3.12 | 24.11 ± 0.87 | **0.04** |
| Duration of marriage – months | 37.35 ± 10.22 | 18.80 ± 9.16 | 22.14 ± 7.32 | 0.18 |
| **Area of Residence** | N (%) | | | |
| Urban | 88 (70.96) | 58 (46.77) | 30 (24.19) | |
| Rural | 36 (29.03) | 20 (16.12) | 16 (12.90) | 0.31 |
| **Education Level** | | | | |
| Illiterate | 66 (53.22) | 36 (29.03) | 30 (24.19) | |
| Primary | 27 (21.77) | 25 (20.16) | 2 (1.61) | 0.77 |
| Secondary | 22 (17.74) | 14 (11.29) | 8 (6.45) | |
| Graduation | 9 (7.25) | 3 (2.41) | 6 (4.83) | |
| **Occupation** | | | | |
| Housewife | 101 (81.45) | 72 (58.06) | 29 (23.38) | |
| Labor work | 11 (8.87) | 5 (4.03) | 6 (4.83) | 0.11 |
| Executive job | 12 (9.67) | 1 (0.80) | 11 (8.87) | |
| **Socioeconomic Status** | | | | |
| Lower | 75 (60.48) | 38 (30.64) | 37 (29.83) | |
| Middle | 38 (30.64) | 32 (25.80) | 6 (4.83) | 0.28 |
| Upper | 11 (8.87) | 8 (6.45) | 3 (2.41) | |
| **Addiction Habit** | | | | |
| Current smoker | 6 (4.83) | 4 (3.22) | 2 (1.61) | 0.14 |
| Chewable tobacco | 42 (33.87) | 35 (28.22) | 7 (5.64) | **0.001** |

*P value <0.05 will be considered statistically significant*

The objective of this study was to find out the true prevalence of infertility reported among patients

presented and diagnosed with PCOS. Graph no. 01 shows that prevalence of infertility was 62.90% (n = 78) and 37.09% (n = 46) did not have infertility. Significant proportion of females aged between 18-24 years had infertility (p 0.04).

**Figure 1: Frequency of infertility among young women with PCOS (N = 124)**
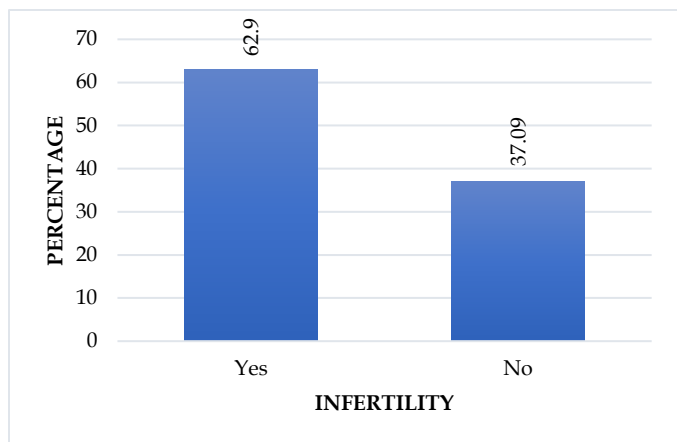


## DISCUSSION

Infertility among women living in developing countries like Pakistan is a common problem and become the leading cause of complicated marriage terms among women and her in-laws. The rate of depression and divorce also increases among infertile women. The reported prevalence of anxiety was 75% and depression was 13.8% among Pakistani infertile women[9] and 21.01% among Iranian women.[10]

Polycystic ovarian syndrome is the primary cause of hyperandrogenism and oligo-anovulation affecting 7% to 15% of women at the reproductive age and is often associated with infertility[6,11,12] and clinical and metabolic disorders.[6] In this study, the prevalence of infertility among young women presented with PCOS was 62.9% (n = 78). However, in an international study, the prevalence of infertility in women with PCOS varies between 70% and 80%.[13] While, in a study conducted by Ugwu GO and colleagues have observed prevalence of PCOS was 18.1% of Nigerian women diagnosed with infertility[14] and more than 90% among women of America.[15] A recently published study by Tay CT[16] has observed lower prevalence of infertility (47.17%) as compared to our study among women with PCOS. This great discrepancy among the prevalence of infertility is most likely due to multiple factors such as lower socioeconomic status, lower literacy level, delay in diagnosis& seeking medical treatment, and/or early approach towards fertility treatment.

In this study we only included young women to determine true burden of infertility among them. The mean age of our study participants was 27.84±4.21 years

but unfortunately, the prevalence of infertility was higher as compared to other studies we mentioned previously. The reason behind this could be male factor, lack of treatment adherence, or lack of healthcare facilities in our area, as most of the study participants belongs to peripheral city of Sindh where healthcare facilities are less advanced than metropolitan cities.

In our study most of the women who had PCOS were obese and their mean BMI levels were 25.14±6.33 kg/m². This is consistent with the previously published study in which authors have observed that obese women were more likely to have poorer reproductive outcomes and fertility prognosis.[17] That is why weight reduction is the most important factor should be addressed among young women with PCOS before any treatment.

## CONCLUSION

Higher infertility rate is observed among young women diagnosed with polycystic ovarian syndrome. Fertility rate can be increased among such women by providing awareness regarding the disease and treatment plan.

## LIMITATIONS

One of the limitations of this study is the relatively small sample size, which may limit the generalizability of the findings to a broader population. The lack of a control group makes it challenging to compare the outcomes observed in the study group with those in a similar population not affected by the condition or intervention being investigated.

## SUGGESTIONS / RECOMMENDATIONS

Encourage ongoing comprehensive research into PCOS and fertility to improve our understanding of the condition and develop innovative treatment strategies. Investing in research initiatives focused on PCOS prevention, early detection, and fertility optimization can ultimately lead to better outcomes for women affected by this condition.

## CONFLICT OF INTEREST / DISCLOSURE

None.

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