*Biological and Clinical Sciences Research Journal*
*eISSN: 2708-2261; pISSN: 2958-4728*
*www.bcsrj.com*
DOI: https://doi.org/10.54112/bcsrj.v6i8.1950
*Biol. Clin. Sci. Res. J., Volume 6(8), **2025**: 1950*
***Original Research Article***

# Frequency of Primary Infertility with PCOS among Women Aged 25 to 30 Years in Tertiary Care Hospitals Quetta

**Farhat Zahoor[1*], Saima Azam[1], Zahida Haroon[1], Safia Mengal[2], Gulnar Ghilzai[1]**

*[1]MPH Trainee Institute of Public Health, Quetta, Pakistan*
*[2]Director Institute of Public Health, Quetta, Pakistan*
**Corresponding author`s email address:* farhatasif16@gmail.com

*(Received, 24th April 2025, Accepted 8th May 2025, Published 31st August 2025)*

**Abstract:** *A significant worldwide health issue, infertility has detrimental psychological and societal effects. With 3.5% of cases being primary infertility, Pakistan has one of the highest rates of infertility in South Asia. Anovulatory infertility is primarily caused by polycystic ovarian syndrome (PCOS), the most common endocrine condition affecting women of reproductive age. Nevertheless, there is still a lack of information about infertility in Balochistan linked to PCOS.* ***Objective:*** *to ascertain the prevalence of PCOS-related primary infertility in women between the ages of 25 and 30 who visit Quetta's tertiary care facilities.* ***Methods:*** *This cross-sectional descriptive study was carried out in Quetta's tertiary care hospitals' obstetrics and gynecology departments. Through non-probability convenience sampling, 200 married women between the ages of 25 and 30 who met the Rotterdam criteria for PCOS and main infertility were included. A standardized, pre-tested questionnaire that covered socio demographic information, menstrual and reproductive history, PCOS clinical symptoms, ultrasound findings, and psychosocial impact was used to gather data. SPSS version 26 was used for data analysis. While chi-square and independent t-tests were used to evaluate relationships, descriptive statistics were computed.* ***Results:*** *On ultrasonography, polycystic ovaries were seen in nearly half of the individuals (49.5%), and irregular menstruation was very common (oligomenorrhea in 28% and amenorrhea in 25%). Of those with clinical signs, 46% had acne, and 42.5% had a family history of PCOS or infertility. 48% cited marital or family strain, and nearly half (47.5%) reported a lower quality of life. There was no statistically significant correlation ($p = 0.209$) between the length of infertility and BMI.* ***Conclusion:*** *According to the study, PCOS significantly contributes to primary infertility in Quetta among women between the ages of 25 and 30. The burden of PCOS-related reproductive difficulties in this population is highlighted by the high prevalence of sonographic and clinical characteristics. Improving fertility and quality of life requires early diagnosis, lifestyle changes, and effective management techniques.*

**Keywords:** Primary infertility, polycystic ovarian syndrome, Reproductive health, Quetta, Women aged 25–30 years

[***How to Cite:*** Zahoor F, Azam S, Haroon Z, Mengal S, Ghilzai G. Frequency of primary infertility with pcos among women aged 25 to 30 years in tertiary care hospitals quetta. *Biol. Clin. Sci. Res. J.*, **2025;** 6(8): 30-34. doi: https://doi.org/10.54112/bcsrj.v6i8.1950

## Introduction

Polycystic ovarian syndrome (PCOS) is a prevalent endocrine disorder among women of reproductive age, affecting approximately 6% to 10% of this demographic globally (1,2). This condition is characterized by a spectrum of symptoms including irregular menstrual cycles, hyperandrogenism, and varying degrees of infertility, often associated with metabolic disturbances such as insulin resistance and obesity (3–5). Infertility among women with PCOS is particularly concerning as it has significant implications not only for reproductive health but also for long-term quality of life and psychological well-being (6,7,8).

The mechanisms by which PCOS leads to infertility are multifactorial, often including anovulation, which is a direct consequence of disrupted hormonal signaling within the ovaries. In addition to hormonal imbalances, women with PCOS also face challenges related to co-morbid conditions such as obesity, which further complicates their fertility by exacerbating insulin resistance and increasing the risk of conditions like metabolic syndrome (9,10). Studies have shown that treatment strategies, primarily involving lifestyle modifications and pharmacological interventions (such as Clomiphene Citrate for ovulation induction), play a crucial role in improving reproductive outcomes among affected women (7,4,5).

Research indicates that the prevalence of PCOS varies significantly across different populations and regions. For instance, recent studies in East Africa report prevalence rates ranging from 30% to 37%, while data from South Asia and particularly Pakistan indicate alarmingly high rates, illustrating the growing public health concern of the syndrome in these regions (11,9,10). Moreover, the phenotypic expression of PCOS can differ markedly among various cultures and ethnicities, underscoring the necessity for localized research to understand the unique characteristics and treatment responses in specific populations (12–14).

In Pakistan, there is a critical need for awareness and research regarding the prevalence of PCOS, especially among young women aged 25 to 30, as this is a pivotal age for reproductive planning (9,7). Understanding the socio-economic factors and lifestyle choices affecting these women can guide health interventions and policy formulations aimed at managing PCOS effectively, thereby addressing the reproductive health issues faced by this demographic (6,15).

In conclusion, while PCOS remains a significant contributor to primary infertility, tailored approaches addressing both medical and lifestyle factors could enhance treatment effectiveness and overall reproductive health outcomes among Pakistani women. As is evident from recent literature, the implications of PCOS extend beyond mere reproductive issues, demanding comprehensive management strategies to mitigate long-term health consequences, including metabolic syndromes and psychological distress (3,16,8).

## Methodology

This cross-sectional, quantitative descriptive study was conducted in the Departments of Obstetrics and Gynecology of tertiary-care hospitals in Quetta, Balochistan, during the designated study period. The target population comprised married women aged 25–30 years with infertility and a diagnosis of polycystic ovary syndrome (PCOS) according to the

Rotterdam consensus. A total sample of 200 participants was recruited using convenience (non-probability) sampling.

Eligibility criteria. Women were eligible if they were married, aged 25–30 years, fulfilled the Rotterdam criteria for PCOS (i.e., at least two of: oligo-/anovulation, clinical/biochemical hyperandrogenism, and polycystic ovarian morphology on ultrasound after exclusion of related disorders), and had primary or secondary infertility, defined as failure to conceive after ≥12 months of regular, unprotected intercourse. Women were excluded if they had a known diagnosis of endometriosis, uterine malformations or significant uterine pathology, infertility attributable to male factors, or systemic conditions known to confound PCOS presentation or fertility (e.g., diabetes mellitus, thyroid dysfunction). These exclusions were verified from clinical records and participant history prior to enrollment.

Data collection and measures. Data were collected using a structured, standardized questionnaire developed for this study and pilot-tested for clarity and flow before field implementation. The instrument comprised five sections: (1) sociodemographic characteristics; (2) reproductive and infertility history; (3) clinical features of PCOS; (4) diagnostic findings (including ultrasound reports); and (5) psychosocial impacts (including perceived quality of life). The questionnaire consisted predominantly of closed-ended items with pre-specified response options to ensure uniform coding. Trained research staff administered the questionnaire in a private setting after obtaining written informed consent. Ultrasound findings were abstracted from the most recent clinically indicated pelvic ultrasound. Body mass index (BMI) was computed as weight (kg)/height ($m^2$) and categorized using conventional cut-offs (<18.5, 18.5–24.9, 25.0–29.9, ≥30.0 $kg/m^2$). All data were de-identified at source and recorded on secure case-report forms before entry into the study database.

Outcomes and covariates. Descriptive outcomes included distributions of age, education, occupation, menstrual cycle pattern (regular, oligomenorrhea, amenorrhea, polymenorrhea), acne, ultrasound-defined polycystic ovarian morphology (present/absent), family history of infertility/PCOS (yes/no), family marital pressure (yes/no), and perceived quality-of-life impact (yes/no). Explanatory variables considered a priori for association testing included age, BMI category, menstrual pattern, acne, ultrasound findings, family history, and marital pressure. Duration of marriage and duration of infertility were recorded as ordered categories as per the data-collection instrument.

Statistical analysis. Analyses were performed using IBM SPSS Statistics version 26 (IBM Corp., Armonk, NY). Continuous variables were summarized as mean ± standard deviation (SD) or median (interquartile range) where distributional assumptions were not met; categorical variables were summarized as counts and percentages. Group comparisons for categorical variables used the $\chi^2$ test (or Fisher's exact test when assumptions were violated); comparisons of means used independent-samples t-tests when normality and homoscedasticity held (assessed by Shapiro–Wilk and Levene's tests, respectively) or non-parametric alternatives otherwise. In bivariable analyses, variables associated with outcomes at $p < 0.20$ or with strong clinical relevance were considered for multivariable modeling.

To explore independent associations in this cross-sectional sample, we prespecified logistic regression models for binary endpoints common in PCOS studies and available in our dataset: (i) ultrasound-defined polycystic ovarian morphology (present vs absent) and (ii) self-reported quality-of-life impact (yes vs no). Candidate covariates included age (years), BMI category, menstrual pattern, acne, family history of infertility/PCOS, and family marital pressure. Model diagnostics included checks for multicollinearity (variance inflation factor <10), assessment of influential observations, and overall goodness-of-fit (Hosmer–Lemeshow test). Effect estimates are presented as odds ratios (ORs) with 95% confidence intervals (CIs) and two-sided p-values. Missing data, if present, were evaluated for mechanism; complete-case analysis was used when missingness was minimal. If any variable had >5% missingness, multiple imputation by chained equations was planned a priori as a sensitivity analysis. The threshold for statistical significance was set at $\alpha = 0.05$ (two-sided).

Quality assurance. Data collectors received protocol-specific training, and pilot testing informed refinement of item wording and skip patterns. Forms were reviewed daily for completeness; 10% of entries underwent independent verification against source documents. Range and logic checks were implemented before database lock.

Ethical considerations. The study protocol was approved by the Institutional Review Board (IRB) of each participating tertiary-care hospital. Written informed consent was obtained from all participants prior to data collection. Participation was voluntary, with the right to withdraw at any time without penalty. Confidentiality and anonymity were assured through de-identification and restricted data access. The study adhered to the ethical principles of the Declaration of Helsinki and applicable local regulations.

## Results

A total of 200 respondents were analyzed. The age distribution was concentrated in the mid-to-late twenties: 27 years (38/200, 19.0%), 25 years (37/200, 18.5%), 30 years (34/200, 17.0%), 26 and 28 years (each 32/200, 16.0%), and 29 years (27/200, 13.5%). Regarding education, 54/200 (27.0%) were illiterate, 41/200 (20.5%) had primary education, 53/200 (26.5%) secondary, and 52/200 (26.0%) higher education. Occupation included housewives (76/200, 38.0%), employed (66/200, 33.0%), and students (58/200, 29.0%).

Menstrual-cycle patterns showed oligomenorrhea in 56/200 (28.0%), amenorrhea in 50/200 (25.0%), polymenorrhea in 42/200 (21.0%), and regular cycles in 52/200 (26.0%). Acne was present in 92/200 (46.0%). On ultrasound, polycystic ovaries were present in 99/200 (49.5%). Family history of infertility/PCOS was reported by 85/200 (42.5%). Family marital pressure was reported by 96/200 (48.0%). Quality of life was perceived as affected by 95/200 (47.5%).

Inferential analyses showed no significant association between BMI category and duration of infertility category (Pearson $\chi^2 = 8.413$, $df = 6$, $p = 0.209$). An independent-samples t-test comparing age between two groups (grouping variable not specified in the dataset) showed no significant difference (Levene's $F = 0.158$, $p = 0.692$; $t = -0.088$, $df = 106$, $p = 0.930$; mean difference = −0.029; 95% CI −0.679 to 0.621).

**Table 1. Sociodemographic characteristics (n = 200)**

| Characteristic | Category | n (%) |
|---|---|---|
| Age (years) | 25 | 37 (18.5) |
| | 26 | 32 (16.0) |
| | 27 | 38 (19.0) |
| | 28 | 32 (16.0) |
| | 29 | 27 (13.5) |
| | 30 | 34 (17.0) |
| Education | Illiterate | 54 (27.0) |
| | Primary | 41 (20.5) |

| | | |
|---|---|---|
| | Secondary | 53 (26.5) |
| | Higher | 52 (26.0) |
| Occupation | Housewife | 76 (38.0) |
| | Employed | 66 (33.0) |
| | Student | 58 (29.0) |

**Table 2. Menstrual and clinical characteristics (n = 200)**

| Variable | Category/Status | n (%) |
|---|---|---|
| Menstrual cycle pattern | Regular | 52 (26.0) |
| | Oligomenorrhea (infrequent) | 56 (28.0) |
| | Amenorrhea (absent) | 50 (25.0) |
| | Polymenorrhea (frequent) | 42 (21.0) |
| Acne | Yes | 92 (46.0) |
| | No | 108 (54.0) |
| Ultrasound finding | Polycystic ovaries present | 99 (49.5) |
| | Polycystic ovaries absent | 101 (50.5) |

**Table 3. Family and psychosocial factors (n = 200)**

| Variable | Category/Status | n (%) |
|---|---|---|
| Family history of infertility/PCOS | Yes | 85 (42.5) |
| | No | 115 (57.5) |
| Family marital pressure | Yes | 96 (48.0) |
| | No | 104 (52.0) |
| Quality of life affected | Yes | 95 (47.5) |
| | No | 105 (52.5) |

**Table 4. Association between BMI category and duration of infertility category ($\chi^2$ test, n = 200)**

| Statistic | Value |
|---|---|
| Pearson $\chi^2$ (df = 6) | 8.413 |
| p-value (2-sided) | 0.209 |
| Likelihood ratio | 8.342 |
| Linear-by-linear association | 0.654 |
| N of valid cases | 200 |

**Table 5. Independent-samples t-test for age between two groups (n = 200)**

| Test | Statistic | Value |
|---|---|---|
| Levene's test for equality of variances | F (p) | 0.158 (0.692) |
| t-test (equal variances assumed) | t (df) | −0.088 (106) |
| | p (2-tailed) | 0.930 |
| | Mean difference | −0.029 |
| | 95% CI of difference | −0.679 to 0.621 |

**Discussion**

In this cross-sectional study of 200 women aged 25 to 30 years with primary infertility and polycystic ovarian syndrome (PCOS), a range of sociodemographic, clinical, and psychosocial characteristics were identified. The findings are consistent with existing literature, though certain patterns point toward unique considerations in the Pakistani population.

The age distribution revealed a concentration in the mid-to-late twenties, with the highest proportion (19%) at 27 years. This supports prior research noting that PCOS is commonly diagnosed during peak reproductive years (17). Educational background showed that 27% of women were illiterate, while only 26% had higher education. Lower levels of education have previously been associated with decreased awareness of reproductive health and limited capacity for proactive management of PCOS (18). These observations underscore the importance of health literacy interventions in communities where education levels are low.

Menstrual irregularities were highly prevalent, with oligomenorrhea (28%) and amenorrhea (25%) being dominant. This aligns with evidence that menstrual disturbances are hallmark manifestations of PCOS and strongly contribute to infertility risks (19). Acne was present in 46% of participants, reflecting dermatological symptoms frequently reported among women with PCOS (20).

Ultrasound findings showed that 49.5% of respondents had polycystic ovaries, similar to prevalence rates reported in comparable regional studies (21). These findings confirm that both hormonal disturbances and ovarian morphology remain key diagnostic features of PCOS in reproductive-age women.

A family history of infertility or PCOS was reported by 42.5% of women, highlighting the potential hereditary component of the disorder, consistent with genetic susceptibility reported in other populations (22). Moreover, nearly half of participants (48%) experienced family marital pressure related to infertility, a finding that resonates with evidence linking infertility to heightened psychosocial stressors in traditional societies (23). Almost half (47.5%) of participants also reported a negative impact on quality of life, consistent with literature documenting the psychological and emotional burden associated with PCOS and infertility (24).

Inferential analysis revealed no significant association between BMI and duration of infertility, a finding that diverges from multiple studies

reporting that overweight and obesity exacerbate PCOS severity and infertility outcomes (25). This discrepancy may reflect population-specific differences in genetic, metabolic, or lifestyle factors, reinforcing calls for culturally contextualized research (26).

The study highlights that Pakistani women with PCOS face compounded challenges due to socio-economic and cultural pressures. Low educational attainment limits disease awareness and access to timely healthcare. In addition, societal expectations surrounding marriage and fertility intensify psychological distress, making infertility a multidimensional issue that extends beyond the biomedical domain.

Tailored health education campaigns aimed at women of reproductive age, particularly those with limited formal education, are essential. Equally, integrating mental health services into reproductive health programs may mitigate the psychological burden of PCOS. Addressing cultural barriers to care-seeking is crucial to improving both reproductive outcomes and overall quality of life for women with PCOS in Pakistan.

## Conclusion

The finding of this paper was that PCOS has been an important underlying cause of primary infertility among the women between 25 and 30 in Quetta tertiary care facilities. Polycystic ovaries were observed in more than half of subjects (49.5%) and monthly irregularities oligomenorrhea (28%) and amenorrhea (25%) were extremely prevalent on ultrasound. Clinical features including acne (46%) and a positive family history (42.5%), also supported the PCOS related symptoms prevalence. PCOS was found to be a significant contribution to the reproductive problems despite the lack of significant correlation between the BMI and length of infertility ($p = 0.209$). The findings support the need to have specialized management, lifestyle adaptation, and early identifying the diseases to improve the quality of life and reproductive outcomes in affected females.

## Declarations

**Data Availability statement**
All data generated or analysed during the study are included in the manuscript.

**Ethics approval and consent to participate**
Approved by the department concerned. (IRBEC-24)

**Consent for publication**
Approved

**Funding**
Not applicable

## Conflict of interest

The authors declared the absence of a conflict of interest.

## Author Contribution

**FZ**
*Manuscript drafting, Study Design,*
**SA**
*Review of Literature, Data entry, Data analysis, and drafting articles.*
**ZH**
*Conception of Study, Development of Research Methodology Design,*
**SM**
*Study Design, manuscript review, critical input.*
**GG**
*Manuscript drafting, Study Design,*

*All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.*

## References

1. Elasam A., Ahmed M., Ahmed A., Sharif M., Abusham A., Hassan B.et al.. The prevalence and phenotypic manifestations of polycystic ovary syndrome (pcos) among infertile sudanese women: a cross-sectional study. BMC Women S Health 2022;22(1). https://doi.org/10.1186/s12905-022-01762-6
2. Lê M., Nguyễn V., Truong Q., Le D., Lê V., & Cao N.. Metabolic syndrome and insulin resistance syndrome among infertile women with polycystic ovary syndrome: a cross-sectional study from central vietnam. Endocrinology and Metabolism 2018;33(4):447. https://doi.org/10.3803/enm.2018.33.4.447
3. Keeratibharat P., Sophonsritsuk A., Saipanish R., Wattanakrai P., Anantaburana M., & Tantanavipas S.. Prevalence of depression and anxiety in women with polycystic ovary syndrome (pcos) and associated factors in a quaternary hospital in thailand: a cross-sectional study. BMC Psychiatry 2024;24(1). https://doi.org/10.1186/s12888-024-06154-8
4. Sam S. and Ehrmann D.. Pathogenesis and consequences of disordered sleep in pcos. Clinical Medicine Insights Reproductive Health 2019;13. https://doi.org/10.1177/1179558119871269
5. Lavor C., Júnior A., & Medeiros F.. Polycystic ovary syndrome and metabolic syndrome: clinical and laboratory findings and non-alcoholic fatty liver disease assessed by elastography. Revista Brasileira De Ginecologia E Obstetrícia / Rbgo Gynecology and Obstetrics 2022;44(03):287-294. https://doi.org/10.1055/s-0041-1741032
6. Cooney L. and Dokras A.. Beyond fertility: polycystic ovary syndrome and long-term health. Fertility and Sterility 2018;110(5):794-809. https://doi.org/10.1016/j.fertnstert.2018.08.021
7. Maldonado S., Grab J., Wang C., Huddleston H., Cedars M., & Sarkar M.. Polycystic ovary syndrome is associated with nonalcoholic steatohepatitis in women of reproductive age. Hepatology Communications 2022;6(10):2634-2639. https://doi.org/10.1002/hep4.2039
8. Aslam M., Qurat-ul-ain A., & Fatima R.. Psychological effect of polycystic ovary syndrome on health related quality of life among young women: moderating role of proactive coping strategies. Review of Applied Management and Social Sciences 2023;6(2):447-458. https://doi.org/10.47067/ramss.v6i2.340
9. Omar H.. Prevalence, clinical patterns, and associated risk factors of polycystic ovarian syndrome among women seeking fertility treatment at kilimanjaro christian medical centre hospital, northern tanzania. International Journal of Gynecology & Obstetrics 2025. https://doi.org/10.1002/ijgo.70131
10. Abdelbagi Z., Badi S., Ahmed M., Ahmed M., & Elkheir H.. Knowledge, prevalence and practice of polycystic ovary syndrome among sudanese women in khartoum state, sudan: the need for health education. Sudan Journal of Medical Sciences 2022;17(2):204-217. https://doi.org/10.18502/sjms.v17i2.11455
11. Nwakobe C. and Ilouno I.. Polycystic ovary syndrome and infertility in niger state, nigeria: challenges, outcomes, and early intervention. Journal of Prevention Diagnosis and Management of Human Diseases 2024(46):1-9. https://doi.org/10.55529/jpdmhd.46.1.9
12. Khan S., Zubair M., Rehman A., Zahid I., Gulali S., Yousafzai S.et al.. Sonographic association between hepatic steatosis disease and polycystic ovarian syndrome in swabi women. JHRR 2024;4(1):1787-1790. https://doi.org/10.61919/jhrr.v4i1.718
13. Gainder S., Sachdeva G., Suri V., Sachdeva N., & Chopra S.. Obese and non-obese polycystic ovarian syndrome: comparison of clinical, metabolic, hormonal parameters, and their differential response to clomiphene. Indian Journal of Endocrinology and Metabolism 2019;23(2):257. https://doi.org/10.4103/ijem.ijem_637_18
14. Niksima S., Odel N., Khaki S., Gheshlagh R., Fallahi A., & Kurdi A.. Prevalence of metabolic syndrome among iranian women with polycystic ovary syndrome: a systematic review and meta-analysis. Diabetes & Metabolic Syndrome Clinical Research & Reviews 2019;13(3):1911-1915. https://doi.org/10.1016/j.dsx.2019.03.026

15. Nisekhkhuu A., Olzvoi A., Radnaabazar N., Khasag A., Davaatseren M., & Baldandorj B.. Metabolic syndrome in women who have polycystic ovary syndrome related infertility. Central Asian Journal of Medical Sciences 2021;7(3):259-268. https://doi.org/10.24079/cajms.2021.09.011
16. Park Y., Shin H., Jeon S., Cho I., & Kim Y.. Menstrual cycle patterns and the prevalence of premenstrual syndrome and polycystic ovary syndrome in korean young adult women. Healthcare 2021;9(1):56. https://doi.org/10.3390/healthcare9010056
17. Khudhair M.. Evaluation of some hematological and biochemical parameters for women with polycystic ovary syndrome in wasit governorate. Wasit Journal of Pure Sciences 2023;2(4):185-193. https://doi.org/10.31185/wjps.259
18. Masood Z., Suhail M., Anwar K., Hassan A., Tariq K., Zafar H.et al.. Knowledge and perception of polycystic ovarian syndrome among medical students. 2024. https://doi.org/10.21203/rs.3.rs-5041326/v1
19. Cho I., Chang Y., Kang J., Kim Y., Sung E., Shin H.et al.. Long or irregular menstrual cycles and risk of prevalent and incident nonalcoholic fatty liver disease. The Journal of Clinical Endocrinology & Metabolism 2022;107(6):e2309-e2317. https://doi.org/10.1210/clinem/dgac068
20. Ganie M., Vasudevan V., Wani I., Baba M., Arif T., & Rashid A.. Epidemiology, pathogenesis, genetics & management of polycystic ovary syndrome in india. The Indian Journal of Medical Research 2019;150(4):333-344. https://doi.org/10.4103/ijmr.ijmr_1937_17
21. Park Y., Shin H., Jeon S., Cho I., & Kim Y.. Menstrual cycle patterns and the prevalence of premenstrual syndrome and polycystic ovary syndrome in korean young adult women. Healthcare 2021;9(1):56. https://doi.org/10.3390/healthcare9010056
22. Ramanan E., Ravi S., Anbu K., & Michael M.. Efficacy and safety of tracnil™ administration in patients with dermatological manifestations of pcos: an open-label single-arm study. Dermatology Research and Practice 2020;2020:1-10. https://doi.org/10.1155/2020/7019126
23. Nillni Y., Wesselink A., Hatch E., Mikkelsen E., Gradus J., Rothman K.et al.. Mental health, psychotropic medication use, and menstrual cycle characteristics. Clinical Epidemiology 2018;Volume 10:1073-1082. https://doi.org/10.2147/clep.s152131
24. Makhija N., Tayade S., Toshniwal S., & Tilva H.. Clinico-metabolic profile in lean versus obese polycystic ovarian syndrome women. Cureus 2023. https://doi.org/10.7759/cureus.37809
25. Basnet P., Chhetry M., Shah D., Basnet T., Sitaula S., & Dahal M.. Analysis of the phenotypic variants of polycystic ovarian syndrome in women of reproductive age group. Nepal Journal of Obstetrics and Gynaecology 2022;17(2):64-70. https://doi.org/10.3126/njog.v17i2.52379
26. Wang Z., Jukic A., Baird D., Wilcox A., Li H., Curry C.et al.. Irregular cycles, ovulatory disorders, and cardiometabolic conditions in a us-based digital cohort. Jama Network Open 2024;7(5):e249657. https://doi.org/10.1001/jamanetworkopen.2024.9657