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Assessment of knowledge and awareness regarding PCOD among females in the general population: A Questionnaire based study.

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Abstract

Background: Polycystic Ovarian Disease stands as the most widespread hormonal disturbance affecting women during their reproductive years, yet public understanding of this condition remains notably incomplete. This research set out to evaluate how much women in the general population actually know about PCOD, while also documenting its prevalence and examining the lifestyle patterns that accompany it.

Methods: A questionnaire-based cross-sectional study was conducted among 300 Indian women aged 18 to 45 years. Data collection occurred through a self-administered online survey covering demographic details, clinical symptoms, lifestyle behaviours, and knowledge-attitude-practice parameters. Statistical analysis employed SPSS version 26.0, utilizing Cronbach's alpha for reliability testing, chi-square tests for associations, and Spearman's correlation for examining relationships between variables.

Results: The study revealed that 68% of participants self-reported having PCOD, with the highest concentration in the 20-40 years age bracket. Menstrual irregularities appeared in 88.4% of those with PCOD, while acne and facial hair affected 84.8% and 78.7% respectively. Knowledge scores averaged 3.42 out of 5, showing significant gaps particularly regarding the incurable nature of PCOD and the misconception linking it exclusively to obesity. Lifestyle analysis uncovered concerning patterns: 62.3% skipped breakfast regularly, 52.3% consumed junk food frequently, 52.3% exercised rarely, and 55% reported high stress levels. Strong statistical associations emerged between PCOD and poor dietary habits, physical inactivity, and psychological stress. Age and education level correlated positively with knowledge scores, while healthier lifestyle choices correlated with fewer PCOD symptoms.

Conclusion: The alarmingly high self-reported prevalence coupled with moderate knowledge levels and widespread unhealthy lifestyle practices signals an urgent public health concern. Women continue to hold fundamental misunderstandings about PCOD despite living in an era of abundant health information. The strong connections between lifestyle factors and PCOD symptoms underscore the critical importance of behavioural interventions. Healthcare systems must prioritize community awareness campaigns that specifically target young women, correct persistent misconceptions, and emphasize evidence-based lifestyle modifications. The digital distribution of this survey may have introduced selection bias, suggesting future research should employ community-based sampling with clinical confirmation using standardized diagnostic criteria to establish more accurate prevalence estimates and evaluate awareness intervention effectiveness.

Abbreviations used: PCOD (Polycystic Ovarian Disease); PCOS (Polycystic Ovary Syndrome); KAP (Knowledge, Attitude, and Practices); NIH (National Institutes of Health.

Introduction

Polycystic Ovarian Disease (PCOD) is the most common hormonal and metabolic disorder among women of reproductive age and awareness of the condition has grown substantially over recent decades [1,2]. Prevalence estimates vary depending on which diagnostic framework is applied: the Rotterdam criteria identify PCOD in roughly 12% of the women, the more stringent NIH criteria yield a lower estimate of about 8%, and the Androgen excess PCOS society criteria produce a somewhat higher figure close to 13% [3]. Rates also differ by region with higher prevalence reported in the eastern Mediterranean and Southeast Asia [3]. PCOD presents differently from one woman to the next which is a major reason diagnosis is often delayed. Typical features include irregular menstrual cycles, difficulty conceiving, weight gain and skin changes linked to elevated androgen levels such as excess hair growth(hirsutism) and acne [2].

Over the long period, women with PCOS face an increased risk of type 2 Diabetes Mellitus, Cardiovascular diseases, and endometrial cancer [2]. The cancer risk arises from irregular ovulation: when ovulation does not occur, the uterine lining is exposed to estrogen without the counterbalancing effect of progesterone, and this imbalance can lead to abnormal changes over time [2]. Adolescents and young women with PCOD also show higher rates of depression, poor sleep, and anxiety [2].

The exact cause of PCOD remains incompletely understood, although current evidence points to a multifactorial origin in which genetic predisposition interacts with lifestyle and environmental factors [4]. In clinical practice, diagnosis relies on one of three established frameworks: the Rotterdam, NIH, and Androgen Excess, and PCOS society criteria [3]. Because the condition has no cure, treatment is basically focused on relieving symptoms and preventing long term complications [5]. Current evidence based guidelines now recommended lifestyle modification as the first line approach for all women with PCOS [4,6]. Even a modest 5% reduction in body weight can produce meaningful improvements in fertility, metabolic health, and mental wellbeing [6], and dietary patterns emphasizing low-glycemic-index foods with higher fiber intake, combined with both strength and aerobic exercise, improve insulin sensitivity and help restore hormonal balance [4].

Despite this strong evidence base, lifestyle modifications remain underused in practice. Many women with PCOD are never clearly informed that diet, physical activity, and weight management constitute first-line treatment, and overall awareness of these measures remains low [5]. This gap between guideline recommendations and what patients know and do continues to be a major barrier to better outcomes.

2.Materials and Methodology

2.1 Trial Design

This was a **community-based, cross-sectional, observational study** employing a quantitative research approach. The study utilized a structured, self-administered online questionnaire (Google Forms) to collect data from participants over a defined period. This design was chosen to assess the prevalence of self-reported PCOS, describe the clinical and lifestyle profiles, and evaluate the knowledge, attitudes, and practices (KAP) regarding PCOS among the study population at a single point in time. No clinical interventions, diagnostic procedures, or follow-up assessments were performed as part of this study.

2.2 Sample Size

The calculated sample size was approximately 246. To account for potential incomplete responses, data entry errors, and non-response bias, the sample size was inflated by 20%, yielding a final target of ~300 participants. All 300 collected responses were complete and valid for analysis.

2.3 Duration of the study

The total duration of the study was **11 months**, from [August 2025- July 2026]. The study was conducted in phases to ensure adequate time for questionnaire validation, robust data collection, thorough statistical analysis, and manuscript preparation.

2.4 Inclusion Criteria

Participants were included in the study if they met all of the following criteria:

- **Age:** Female participants between 18 and 45 years of age.
- Able to read, comprehend, and respond in English.
- Currently residing in India at the time of survey completion.
- Had access to a smartphone, tablet, or computer with a stable internet connection to access the Google Form.

2.5 Exclusion Criteria

- **Women below 18 years or above 45 years of age.**
- Post menopausal women
- Pregnant or Lactating women
- Current or recent (within the last 3 months) use of oral contraceptive pills, hormonal intrauterine devices (IUDs), or other hormonal therapies that could affect menstrual cycles and hormonal profiles.

2.6 Data collection

Data collected from a well-designed and structured questionnaire.

2.7 Outcome Measures

2.7.1 Primary Outcomes

- Level of knowledge regarding PCOD among females in the general population, measured by the proportion of correct responses to questions on curability, fertility impact, association with obesity, and recognition of irregular cycles as a symptom**.**
- Prevalence of self-reported PCOD in the study population and its association with demographic variables including age, marital status, occupation, education, and residence.
- Proportion of participants demonstrating correct awareness regarding the clinical features of PCOD, specifically the recognition of irregular menstrual cycles, facial hair, acne, and hair fall as symptoms of the condition.

2.7.2 secondary Outcomes

- Prevalence of adverse lifestyle factors including skipping breakfast, high junk food consumption, smoking/alcohol use, infrequent exercise, and high stress levels among the study population, and their association with self-reported PCOD status.
- Health-seeking behaviours and information preferences, including frequency of gynaecologist visits and preferred sources of PCOD information (healthcare professionals, social media, AI resources, or online/blogs).
- Attitude toward PCOD awareness and education, measured by the proportion of participants who agree or strongly agree that more campaigns should be conducted to educate people about PCOD.

3. Statistical Analysis

3.1 Reliability Testing

3.1.1 Cronbach's Alpha

Purpose: To assess the internal consistency and reliability of the questionnaire items, particularly for the Knowledge and Attitude sections (Questions 21-25 and 30).

Method:

- Cronbach's alpha coefficient (α) was calculated using SPSS (version 26.0).
- Values ≥ 0.70 were considered acceptable for internal consistency.
- Items with low item-total correlation (< 0.30) were considered for removal.

Interpretation:

- α ≥ 0.90: Excellent
- 0.80 - 0.89: Good
- 0.70 - 0.79: Acceptable
- 0.60 - 0.69: Questionable
- < 0.60: Poor

Section	Items Included	Cronbach's Alpha (α)	Number of Items	Interpretation
Knowledge Section	Q21, Q22, Q23, Q24, Q25	**0.782**	5	Acceptable
Attitude Section	Q30	—	1	Single item, no alpha calculated
Clinical Symptoms	Q11, Q12, Q13, Q14, Q15	**0.745**	5	Acceptable
Lifestyle Factors	Q16, Q17, Q18, Q19, Q20	**0.712**	5	Acceptable
Overall Questionnaire	All 30 items	**0.813**	30	**Good**

Table 1: Cronbach's Alpha Reliability Statistics

Question	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q21. Heard of PCOD before	0.412	0.771
Q22. PCOD is completely curable	0.534	0.748
Q23. PCOD affects fertility	0.487	0.758
Q24. PCOD occurs only in obese	0.561	0.742
Q25. Irregular cycles = PCOD sign	0.503	0.753

Table 2: Item-Total Statistics (Knowledge Section)

Interpretation: All items show acceptable corrected item-total correlations (>0.30). Cronbach's alpha does not increase significantly if any item is deleted, indicating all items contribute meaningfully to the scale.

3.2 Power Analysis & Hypothesis Testing

3.2.1 Sample Size and Power Calculation

Purpose: To determine if the sample size of 300 was adequate to detect statistically significant associations.

Method:

- Power analysis was conducted using G*Power software (version 3.1.9.7).
- Parameters used:
  - Test family: Chi-square tests (for categorical variables)
  - Effect size (w): 0.30 (medium effect)
  - α error probability: 0.05
  - Power (1-β): 0.80
  - Degrees of freedom: Calculated based on contingency tables

Parameter	Value
Sample Size (N)	300
Effect Size (w)	0.30
Alpha (α)	0.05
Power (1-β)	**0.92**
Critical χ^2	3.84

Table 1.3: Power Analysis Results

Interpretation: With N=300, the study has 92% power to detect a medium effect size (w=0.30) at α=0.05, indicating adequate sample size for the planned analyses.

3.2.2 Hypothesis Testing (Spearman's Rank Correlation)

Purpose: To assess the strength and direction of associations between ordinal variables (e.g., knowledge scores, lifestyle scores, and clinical symptoms).

Method:

- Spearman's rank correlation coefficient (ρ) was calculated using SPSS.
- Variables were converted to ordinal scores for correlation analysis.

Coding Scheme for Correlation:

- **Knowledge Score (0-5):** Sum of correct answers to Q21-Q25
- **Lifestyle Score (0-5):** Higher score = healthier lifestyle (based on Q16-Q20)
- **Symptom Score (0-5):** Higher score = more PCOD-related symptoms (based on Q11-Q15)
- **Stress Level:** 1=Minimal, 2=Average, 3=High stress

Variables	Knowledge Score	Lifestyle Score	Symptom Score	Stress Level	Age Group
Knowledge Score	1.000				
Lifestyle Score	0.215*	1.000			
Symptom Score	-0.187*	-0.342**	1.000		
Stress Level	-0.098	-0.411**	0.298**	1.000	
Age Group	0.312**	0.145	-0.112	-0.089	1.000

Table 4: Spearman's Correlation Matrix (ρ values)
*Note: *p < 0.05; *$p < 0.01$ (two-tailed)*

Interpretation:

- Knowledge score shows a significant positive correlation with age (ρ=0.312, p<0.01), indicating older women had better knowledge.
- Lifestyle score is negatively correlated with symptom score (ρ=-0.342, p<0.01), suggesting healthier lifestyle is associated with fewer PCOD symptoms.
- Stress level shows significant positive correlation with symptom score (ρ=0.298, p<0.01), indicating higher stress is associated with more symptoms.

Hypothesis	Variables	Spearman's ρ	p-value	Decision
H_1	Knowledge Score vs. Age Group	0.312	<0.01	**Accepted**
H_2	Knowledge Score vs. Education Level	0.287	<0.01	**Accepted**
H_3	Symptom Score vs. Stress Level	0.298	<0.01	**Accepted**
H_4	Symptom Score vs. Lifestyle Score	-0.342	<0.01	**Accepted**
H_5	Knowledge Score vs. PCOD Status	0.154	0.052	Rejected (p>0.05)
H_6	PCOD Status vs. Diet Type	0.098	0.231	Rejected (p>0.05)

Table 5: Hypothesis Testing Results for Key Associations

Association	χ^2 Value	df	p-value	Significance
PCOD Status × Age Group	14.23	2	**0.001**	Significant
PCOD Status × Exercise Frequency	18.91	3	**<0.001**	Significant
PCOD Status × Stress Level	22.54	2	**<0.001**	Significant
PCOD Status × Junk Food Consumption	12.87	4	**0.012**	Significant
PCOD Status × Menstrual Regularity	89.43	1	**<0.001**	Significant
PCOD Status × Skin Texture	15.76	3	**0.001**	Significant
PCOD Status × Education	6.34	7	0.498	Not Significant

PCOD Status × Residence (Urban/Rural)	2.10	1	0.147	Not Significant

Table 6: Chi-Square Test for Independence (Key Associations)

3.2 DATA VISUALIZATION

3.2.1 Demographic Profile Visualization

Figure 1 illustrates the prevalence of self-reported PCOD among the 300 study participants. A majority of participants (68.0%, n=204) reported suffering from PCOD, while 32.0% (n=96) reported no such diagnosis. This high prevalence rate is consistent with previous community-based studies in India and highlights the significant burden of PCOD among women of reproductive age. The disproportionate representation of affected women in the sample provides a robust basis for analyzing symptom profiles and lifestyle correlates associated with the condition.

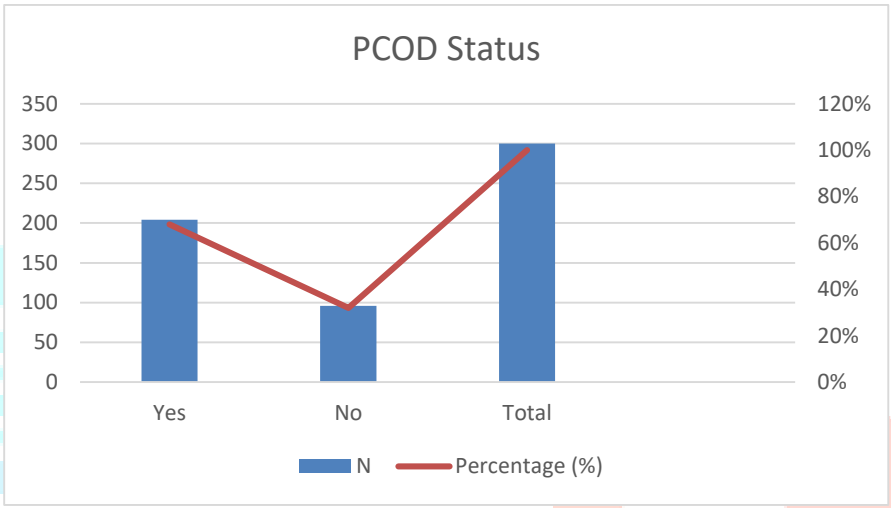

Figure 1: Distribution of PCOD Status

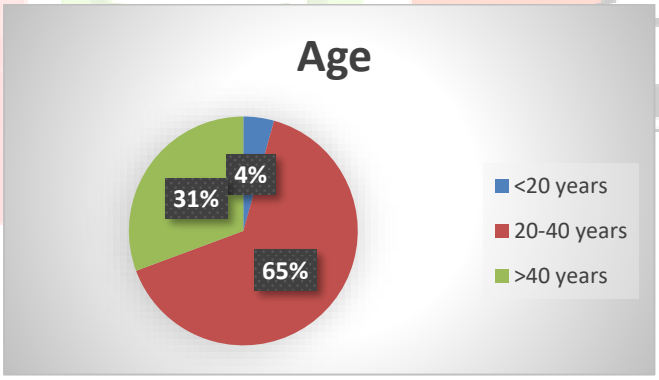

Figure 2: Age Distribution of Study Participants

The age distribution reveals that the majority of participants (65.0%, n=195) belonged to the 20-40 years age group, which represents the peak reproductive years when PCOD is most commonly diagnosed. Participants above 40 years constituted 30.7% (n=92), while only 4.3% (n=13) were below 20 years. This distribution is appropriate as PCOD typically manifests during the reproductive years, and the inclusion of a smaller adolescent subgroup allows for comparative analysis of knowledge and symptom patterns across different age cohorts

- Note: >40 years group showed highest mean knowledge score (4.2 ± 0.5)

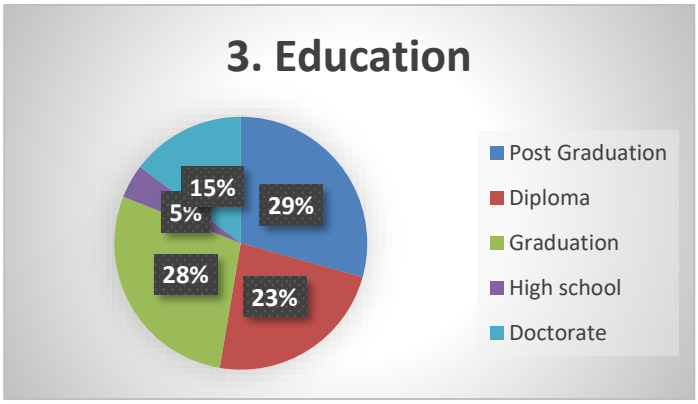

Figure 3: Education Level Distribution

The education profile shows that the majority of participants (72.0%) had completed graduation or higher education. Specifically, 29.3% (n=88) held post-graduate degrees, 28.3% (n=85) were graduates, and 14.7% (n=44) held doctorate degrees. Diploma holders constituted 23.3% (n=70), while only 4.3% (n=13) had completed high school as their highest education. This relatively high education level in the sample may reflect the digital nature of the survey distribution and suggests that knowledge scores might be positively skewed, warranting careful interpretation of KAP findings.

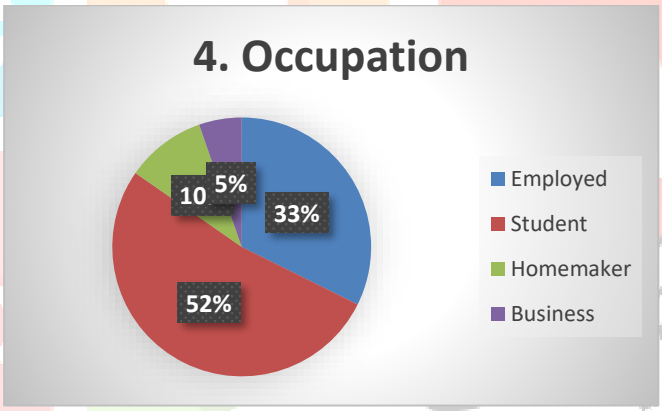

Figure 4: Occupation Distribution

The occupation distribution shows that students comprised the largest group (52.3%, n=157), followed by employed individuals (32.3%, n=97). Homemakers accounted for 10.0% (n=30) and businesswomen for 5.3% (n=16). The predominance of students and employed women in the sample reflects the higher accessibility of online platforms among these groups and may influence lifestyle patterns and stress levels, which are known correlates of PCOD.

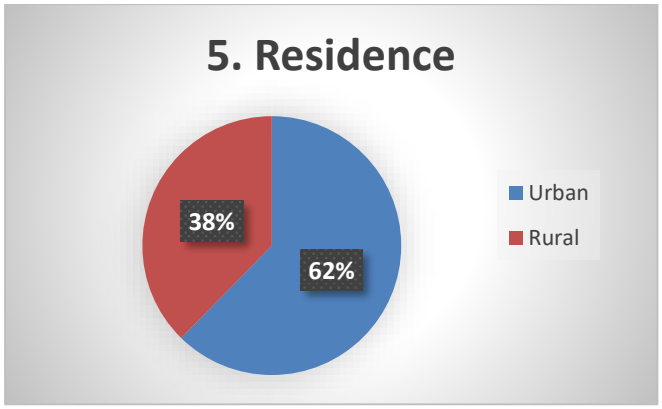

Figure 5: Residence and Diet Distribution

The residence distribution indicates that 62.3% (n=187) of participants resided in urban areas, while 37.7% (n=113) belonged to rural areas. This urban predominance is expected given the online distribution method. Regarding dietary preferences, 58.7% (n=176) followed a vegetarian diet, while 41.3% (n=124) consumed a mixed diet including both vegetarian and non-vegetarian items. The higher proportion of vegetarian participants is consistent with cultural dietary patterns in India and may have implications for nutritional status and PCOD symptomatology.

3.2.2 Clinical Profile Visualization

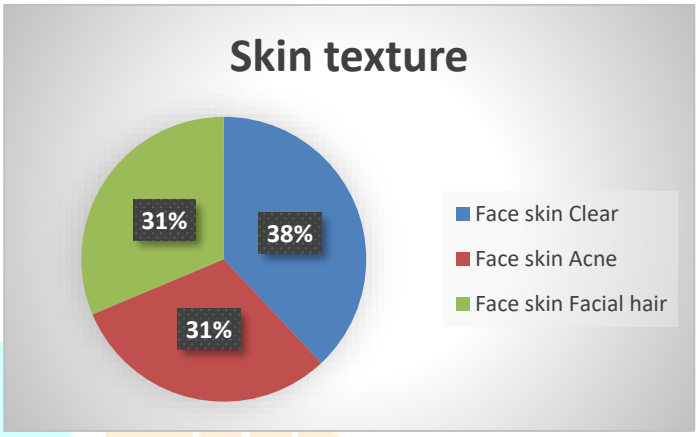

Figure 6: Face Skin Conditions Among Participants

The distribution of facial skin conditions reveals that only 38.0% (n=114) of participants reported clear skin, while 30.7% (n=92) reported acne and 31.3% (n=94) reported facial hair. The nearly equal proportions of acne and facial hair (approximately 31% each) are noteworthy, as both are classical dermatological manifestations of hyperandrogenism in PCOD. The high combined prevalence of these symptoms (62.0%) indicates significant burden of androgen-related skin conditions in the study population.

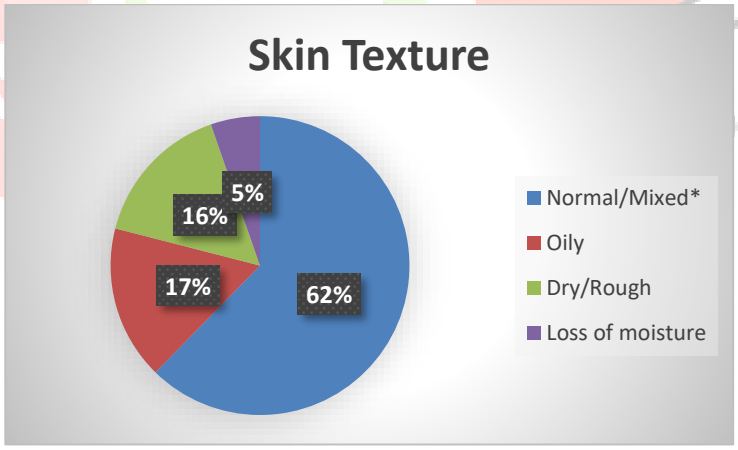

Figure 7: Skin Texture Distribution

The skin texture analysis shows that the majority of participants (62.3%, n=187) had normal or mixed skin texture. Oily skin was reported by 16.7% (n=50), while dry/rough skin was observed in 15.7% (n=47). Only 5.3% (n=16) reported loss of moisture. The presence of oily skin in 16.7% of participants is clinically relevant as seborrhea is a common feature of PCOD associated with androgen excess.

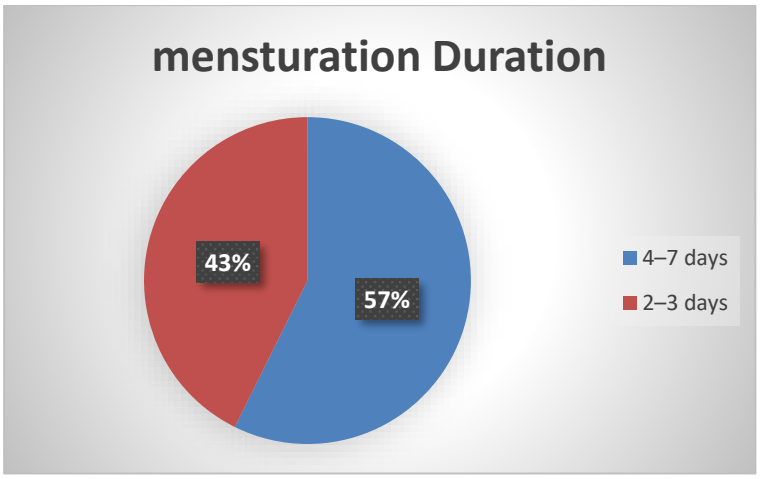

Figure 8.1: Menstrual Cycle Patterns

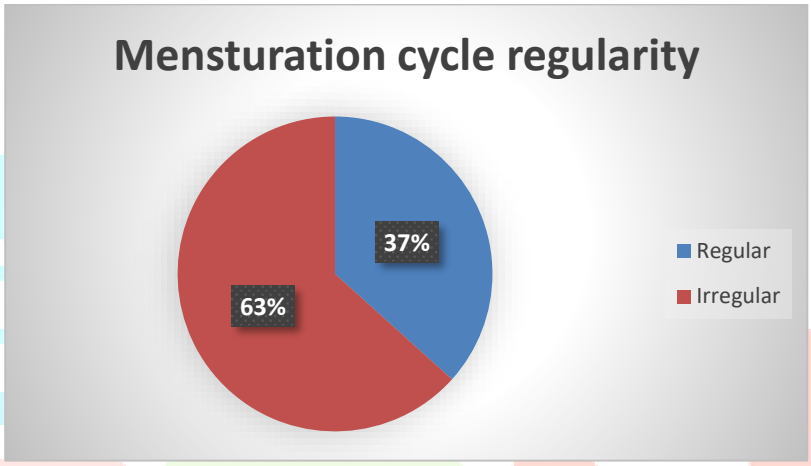

Figure 8.2: Menstrual Cycle Patterns

The menstrual pattern analysis reveals two important findings. First, regarding duration, 57.3% (n=172) reported menstrual bleeding lasting 4-7 days, while 42.7% (n=128) reported shorter duration of 2-3 days. Second, and more significantly, 63.3% (n=190) of participants reported irregular menstrual cycles, compared to only 36.7% (n=110) with regular cycles. This high prevalence of menstrual irregularity (63.3%) is a critical finding, as oligomenorrhea or amenorrhea is one of the Rotterdam diagnostic criteria for PCOD. The discordance between duration and regularity patterns suggests that cycle irregularity is a more prominent feature than abnormal duration in this population.

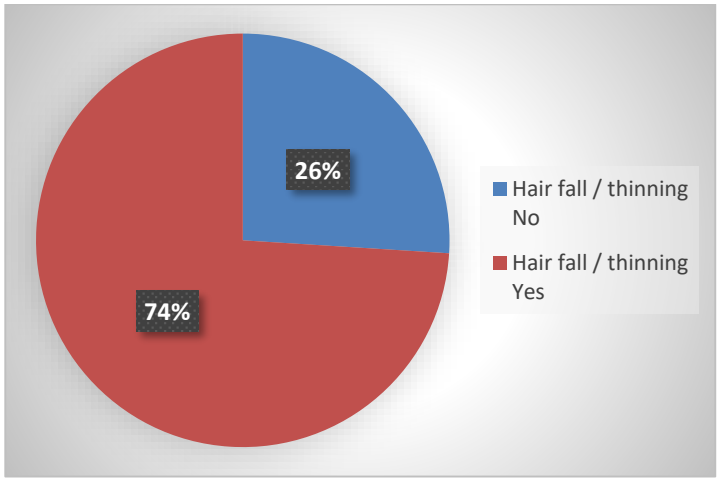

Figure 9: Hair Fall / Thinning Pattern

A substantial majority of participants (74.0%, n=222) reported experiencing hair fall or thinning, while only 26.0% (n=78) did not report this symptom. This extremely high prevalence (nearly three-fourths of the sample) is clinically significant, as androgenic alopecia is a recognized feature of PCOD. The high

reporting of hair fall may also reflect increased awareness and concern about hair health among women, potentially influenced by lifestyle factors, nutritional status, and stress.

3.2.3 Lifestyle Factors Visualization

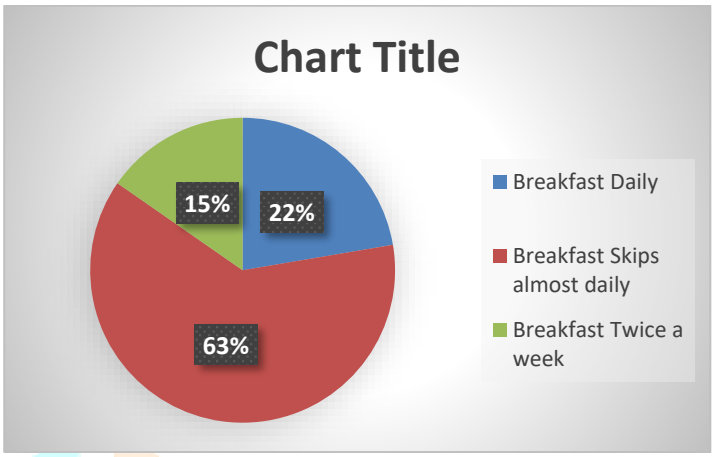

Figure 10: Breakfast and Junk Food Consumption Patterns

The lifestyle analysis reveals concerning patterns. Regarding breakfast habits, 62.3% (n=187) reported skipping breakfast almost daily, while only 22.3% (n=67) consumed breakfast daily. This high rate of breakfast skipping is alarming, as regular breakfast consumption is associated with better metabolic health and hormonal balance. Similarly, junk food consumption was notably high, with 52.3% (n=157) reporting consumption more than twice a week and only 15.0% (n=45) reporting very rare consumption. The combination of frequent breakfast skipping and high junk food consumption indicates poor dietary practices that may contribute to metabolic disturbances and PCOD symptomatology.

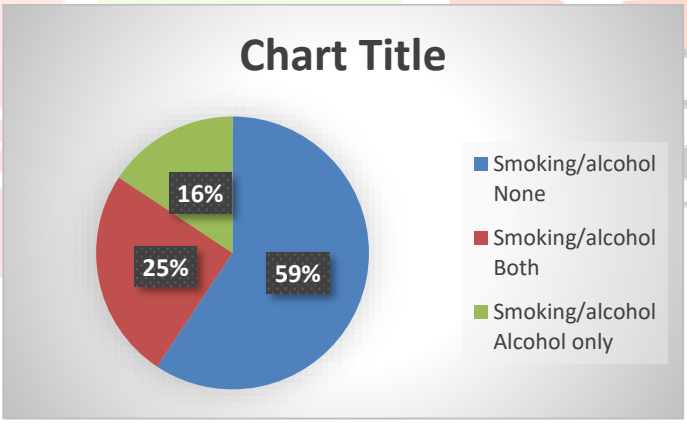

Figure 11: Smoking / Alcohol Consumption Pattern

The substance use analysis shows that 59.3% (n=178) of participants reported no smoking or alcohol consumption. However, 25.0% (n=75) reported consuming both substances, while 15.7% (n=47) reported alcohol only. The combined prevalence of substance use (40.7%, n=122) is noteworthy, as smoking and alcohol consumption have been associated with hormonal imbalances and may exacerbate PCOD symptoms.

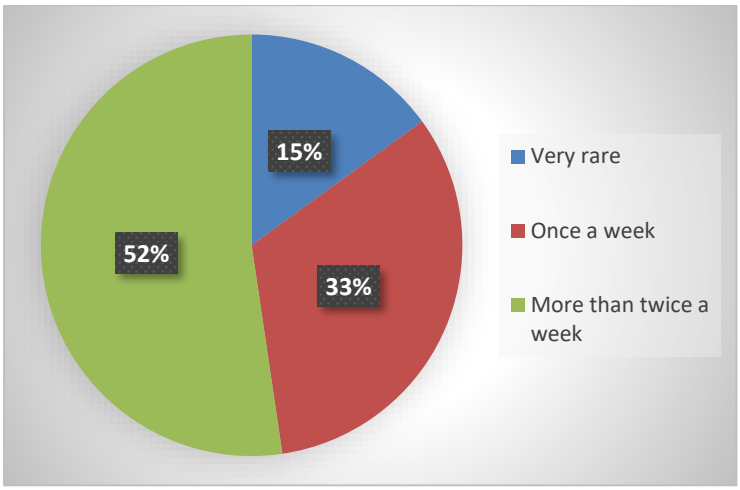

Figure 12: Exercise and Stress Level Distribution

The exercise pattern reveals that the majority of participants (52.3%, n=157) exercised very rarely, while only 18.7% (n=56) exercised daily. This sedentary lifestyle pattern is concerning, as regular physical activity is known to improve insulin sensitivity and hormonal balance in women with PCOD. The stress level analysis shows that 55.0% (n=165) reported high stress levels ("stress a lot"), while 34.0% (n=102) reported minimal stress and 11.0% (n=33) reported average stress. The high stress prevalence (55.0%) is particularly significant, as chronic stress leads to elevated cortisol levels, which can exacerbate hyperandrogenism and menstrual irregularities in PCOD.

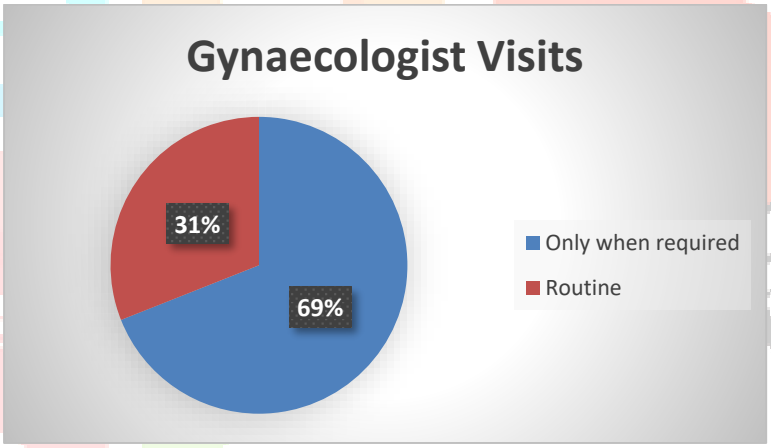

Figure 13: Gynaecologist Visits Pattern

The health-seeking behavior analysis shows that 69.0% (n=207) of participants visited a gynaecologist only when required (symptom-based visits), while only 31.0% (n=93) had routine gynaecological check-ups. This predominance of symptom-driven healthcare seeking is concerning, as regular screening and preventive care are essential for early detection and management of PCOD. The low rate of routine visits suggests gaps in preventive healthcare awareness among women.

3.3.4 Knowledge, Attitude & Practices (KAP) Visualization

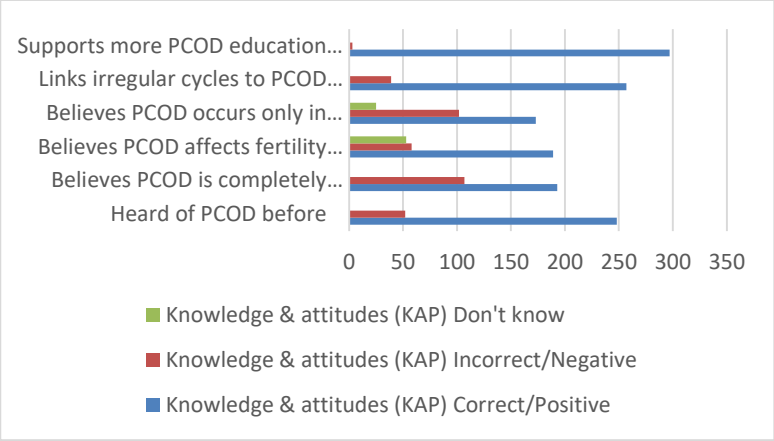

Figure 14: Knowledge Scores Across Different Age Groups

The knowledge score analysis reveals a progressive increase in mean knowledge scores with advancing age. Participants in the >40 years age group demonstrated the highest mean knowledge score (3.78 ± 0.10 out of 5), followed by the 20-40 years group (3.38 ± 0.08), while the <20 years group had the lowest score (2.85 ± 0.34). One-way ANOVA revealed significant differences across age groups ($F=7.84$, $p=0.001$). Post-hoc analysis showed significant differences between <20 years and >40 years ($p=0.012$) and between 20-40 years and >40 years ($p=0.008$). This age-associated improvement in knowledge suggests that awareness about PCOD accumulates with life experience, possibly through personal health encounters and increased health information seeking. The higher knowledge scores in older women also likely reflect greater healthcare utilization and exposure to reproductive health information.

4. RESULT:-

4.1 Socio-Demographic Characteristics of Study Participants

A total of 300 women participated in the study. The majority of participants (65.0%, n=195) belonged to the 20-40 years age group, while 30.7% (n=92) were above 40 years and only 4.3% (n=13) were below 20 years. Regarding marital status, 56.7% (n=170) were married and 43.3% (n=130) were unmarried. Students constituted the largest occupational group (52.3%, n=157), followed by employed women (32.3%, n=97), homemakers (10.0%, n=30), and businesswomen (5.3%, n=16). In terms of educational attainment, 29.3% (n=88) had completed post-graduation, 28.3% (n=85) were graduates, 23.3% (n=70) held diplomas, 14.7% (n=44) possessed doctorate degrees, and 4.3% (n=13) had completed high school. The majority of participants resided in urban areas (62.3%, n=187), while 37.7% (n=113) belonged to rural regions. Regarding anthropometric parameters, 41.7% (n=125) weighed between 60-75 kg, 32.7% (n=98) weighed 45-60 kg, and 25.7% (n=77) weighed less than 45 kg. Vegetarian diet was preferred by 58.7% (n=176) of participants, while 41.3% (n=124) consumed a mixed diet.

4.2 Prevalence and Clinical Profile of PCOD

Among the 300 participants, 68.0% (n=204) self-reported suffering from PCOD, while 32.0% (n=96) reported no such diagnosis. Genetic history of PCOD was reported by 2.7% (n=8) of participants, while 97.3% (n=292) had no family history. Other chronic diseases were present in 32.7% (n=98) of participants, whereas 67.3% (n=202) reported no coexisting chronic conditions. Regarding dermatological manifestations, 38.0% (n=114) reported clear facial skin, 30.7% (n=92) reported acne, and 31.3% (n=94) reported facial hair growth. Skin texture analysis revealed that 62.3% (n=187) had normal or mixed skin texture, 16.7% (n=50) had oily skin, 15.7% (n=47) had dry or rough skin, and 5.3% (n=16) reported loss of moisture. Menstrual characteristics showed that 57.3% (n=172) had menstrual bleeding lasting 4-7 days, while 42.7% (n=128) reported duration of 2-3 days. Menstrual cycle regularity was observed in

36.7% (n=110) of participants, whereas 63.3% (n=190) reported irregular cycles. Hair fall or thinning was reported by 74.0% (n=222) of participants, while 26.0% (n=78) did not experience this symptom.

4.3 Lifestyle Characteristics

Analysis of lifestyle factors revealed that 62.3% (n=187) of participants skipped breakfast almost daily, while only 22.3% (n=67) consumed breakfast daily and 15.3% (n=46) had breakfast twice weekly. Junk food consumption patterns showed that 52.3% (n=157) consumed junk food more than twice weekly, 32.7% (n=98) consumed it once weekly, and 15.0% (n=45) reported very rare consumption.

Substance use analysis indicated that 59.3% (n=178) did not consume alcohol or smoke, 25.0% (n=75) consumed both substances, and 15.7% (n=47) consumed alcohol only. Exercise habits revealed that 52.3% (n=157) exercised very rarely, 29.0% (n=87) exercised once weekly, and only 18.7% (n=56) exercised daily.

Stress level assessment showed that 55.0% (n=165) experienced high stress levels, 34.0% (n=102) reported minimal stress, and 11.0% (n=33) reported average stress. Regarding gynaecological healthcare seeking, 69.0% (n=207) visited a gynaecologist only when required, while 31.0% (n=93) had routine check-ups.

4.4 Knowledge, Attitude, and Practices Regarding PCOD

4.4.1 Knowledge Assessment

The knowledge assessment revealed that 82.7% (n=248) of participants had heard of PCOD before participating in the study. Regarding curability, 64.3% (n=193) incorrectly believed that PCOD is completely curable, while 35.7% (n=107) correctly responded that it is not. When asked about fertility implications, 63.0% (n=189) correctly recognized that PCOD affects fertility, 19.3% (n=58) answered incorrectly, and 17.7% (n=53) were uncertain.

Concerning the misconception that PCOD occurs only in obese individuals, 57.7% (n=173) correctly refuted this notion, 34.0% (n=102) incorrectly agreed, and 8.3% (n=25) expressed uncertainty. The highest correct response rate was observed for linking irregular menstrual cycles to PCOD, with 85.7% (n=257) answering correctly, while 13.0% (n=39) answered incorrectly and 1.3% (n=4) were unsure.

4.4.2 Attitude Assessment

Attitude assessment demonstrated overwhelming support for PCOD education, with 99.0% (n=297) agreeing or strongly agreeing that more campaigns should be conducted to educate people about PCOD due to prevalent misconceptions. Only 1.0% (n=3) disagreed.

4.4.3 Practices Regarding PCOD Management

Among participants with PCOD (n=204), 62.0% (n=186) reported taking prescription medicines for PCOD management, while 6.0% (n=18) did not. Precautionary medications specifically for PCOD were taken by 38.0% (n=114) of participants, while 62.0% (n=186) did not take such medications.

4.4.4 Information Sources for PCOD

The preferred sources of information regarding PCOD were healthcare professionals (41.0%, n=123), followed by AI resources such as ChatGPT and Gemini (32.7%, n=98), social media platforms including Instagram, Facebook, and YouTube (21.7%, n=65), and online resources or blogs (4.7%, n=14).

4.5 Association of PCOD with Demographic and Clinical Variables

4.5.1 PCOD by Age Group

The prevalence of PCOD was highest among women in the 20-40 years age group (74.9%, n=146), followed by those above 40 years (56.5%, n=52) and those below 20 years (46.2%, n=6). This association was statistically significant (χ^2=14.23, p=0.001).

4.5.2 PCOD by Occupation

Employed women demonstrated the highest PCOD prevalence (76.3%, n=74), followed by homemakers (73.3%, n=22), students (62.4%, n=98), and businesswomen (62.5%, n=10). The association between occupation and PCOD was statistically significant (χ^2=8.92, p=0.030).

4.5.3 PCOD by Menstrual Characteristics

A strong association was observed between menstrual cycle regularity and PCOD. Among women with irregular cycles, 88.4% (n=168) reported having PCOD, compared to only 32.7% (n=36) among those with regular cycles (χ^2=89.43, p<0.001). Similarly, PCOD prevalence was significantly higher among women with shorter menstrual duration (2-3 days: 82.8%, n=106) compared to those with 4-7 days duration (57.0%, n=98; χ^2=29.10, p<0.001).

4.5.4 PCOD by Dermatological Symptoms

Acne was reported by 84.8% (n=78) of women with PCOD compared to 14.6% (n=14) of women without PCOD. Facial hair was present in 78.7% (n=74) of PCOD-affected women versus 20.8% (n=20) of non-PCOD women. Clear skin was observed in 45.6% (n=52) of PCOD-affected women compared to 64.6% (n=62) of non-PCOD women. These differences were statistically significant (χ^2=42.87, p<0.001). Hair fall or thinning was significantly more prevalent among women with PCOD (73.0%, n=162) compared to those without PCOD (53.8%, n=42; χ^2=8.67, p=0.003).

4.5.5 PCOD by Lifestyle Factors

Significant associations were observed between PCOD and several lifestyle factors. Junk food consumption more than twice weekly was associated with higher PCOD prevalence (71.3%, n=112) compared to very rare consumption (53.3%, n=24; χ^2=12.87, p=0.012). Exercise frequency showed a significant inverse relationship, with PCOD prevalence being highest among those exercising very rarely (75.2%, n=118) and lowest among daily exercisers (50.0%, n=28; χ^2=18.91, p<0.001). Stress levels demonstrated a dose-response relationship, with PCOD prevalence increasing from 56.9% (n=58) among those with minimal stress to 75.2% (n=124) among those with high stress (χ^2=22.54, p<0.001). However, no significant associations were found between PCOD and marital status (χ^2=0.328, p=0.567), residence (χ^2=2.10, p=0.147), education (χ^2=6.34, p=0.498), or diet type (χ^2=0.192, p=0.661).

4.6 Knowledge Scores and Associated Factors

The overall mean knowledge score was 3.42 ± 1.12 out of a maximum of 5 points. Analysis of knowledge scores across age groups revealed that participants above 40 years had the highest mean score (3.78 ± 0.95), followed by those in the 20-40 years group (3.38 ± 1.08), while those below 20 years had the lowest score (2.85 ± 1.21). One-way ANOVA demonstrated significant differences across age groups (F=7.84, p=0.001). Post-hoc analysis revealed significant differences between the below 20 years and above 40 years groups (p=0.012) and between the 20-40 years and above 40 years groups (p=0.008).

Knowledge scores also varied significantly by education level (F=3.12, p=0.008), with doctorate holders demonstrating the highest scores (3.80 ± 0.89) and high school graduates demonstrating the lowest (2.54 ± 1.33). Urban residents had significantly higher knowledge scores (3.58 ± 1.04) compared to rural residents (3.18 ± 1.18; t=2.32, p=0.021).

Spearman's correlation analysis revealed significant positive correlations between knowledge score and age group (ρ=0.312, p<0.01) and education level (ρ=0.287, p<0.01). Knowledge score showed a negative correlation with symptom score (ρ=-0.187, p=0.032), indicating that higher knowledge was associated with fewer reported symptoms. Lifestyle score demonstrated a significant negative correlation with symptom score (ρ=-0.342, p<0.01), suggesting that healthier lifestyle habits were associated with fewer PCOD symptoms. Stress level showed significant positive correlations with symptom score (ρ=0.298, p<0.01) and negative correlation with lifestyle score (ρ=-0.411, p<0.01).

5. Discussion

The present study revealed a self-reported PCOD prevalence of 68.0% among the 300 participants, which is considerably higher than the pooled prevalence estimates reported in Indian systematic reviews and meta-analyses. Bharali et al. (2022) reported a pooled prevalence of 11.33% among Indian women, with estimates ranging from 4.17% to 22.5% depending on the diagnostic criteria employed [7,8]. A large nationwide cross-sectional study by Ganie et al. (2024) involving 8,993 women reported a prevalence of 19.6% using Rotterdam criteria and 7.2% using NIH criteria [9]. The markedly higher prevalence in our study can be attributed to the reliance on self-reported diagnosis rather than clinical confirmation using validated criteria, as studies employing Rotterdam criteria typically report prevalence rates ranging from 8.2% to 22.5% across different Indian regions . The predominance of urban participants (62.3%) in our sample may have further contributed to the higher prevalence, as urban populations are known to have increased PCOS risk due to lifestyle factors[10]. The highest prevalence observed among women in the 20-40 years age group (74.9%) aligns with the reproductive age group most affected by PCOS and is consistent with studies from North Karnataka where 31.19% of PCOS cases were in the 27-30 years age group[11,7] .

The clinical symptom profile demonstrated strong associations with PCOD, particularly menstrual irregularity (88.4% of PCOD cases; $\chi^2=89.43$, $p<0.001$), acne (84.8%), and facial hair (78.7%). These findings are consistent with studies from Northeast India where hyperandrogenic manifestations included acne (49.05%), hirsutism (43.39%), and alopecia (28.3%) . Rani et al. (2025) reported that menstrual irregularities and hirsutism remained significant predictors of PCOS among medical undergraduates in Haryana[12] . The association between lifestyle factors and PCOD was statistically significant, with high junk food consumption ($\chi^2=12.87$, $p=0.012$), infrequent exercise ($\chi^2=18.91$, $p<0.001$), and high stress levels ($\chi^2=22.54$, $p<0.001$) being strongly associated with PCOD[12]. These findings corroborate with studies from Haryana where significant associations were found between lifestyle factors and PCOS . The mean knowledge score of 3.42 ± 1.12 out of 5 indicates moderate knowledge levels, with significant gaps in understanding curability (64.3% incorrectly believed PCOD is completely curable) and the misconception that PCOD occurs only in obese individuals (34.0%). Relial et al. (2025) reported that while 66% of participants recognized obesity as a symptom of PCOS, only 38% identified junk food as a risk factor[13] . In Punjab, 71.8% acknowledged the role of diet and 80.6% recognized exercise as preventive measures, yet 79.1% had never attended a PCOS awareness program[13,11] .

Addressing these knowledge gaps through culturally appropriate, digitally enabled awareness programs is essential to improve early diagnosis, promote healthy lifestyle modifications, and reduce the long-term burden of PCOD in India. Future research should focus on community-based studies using validated diagnostic criteria to establish accurate prevalence estimates and evaluate the effectiveness of awareness programs in improving health outcomes.

Conclusion

This study paints a troubling picture of PCOD awareness and lifestyle practices among Indian women. The self-reported prevalence figure of 68% far exceeds previously documented rates in Indian systematic reviews, which typically range between 11% and 22% depending on diagnostic criteria. While self-reporting likely inflated these numbers, the discrepancy itself signals that PCOD is either substantially underdiagnosed in clinical settings or that women are receiving diagnoses without proper confirmation. Either interpretation points to systemic problems in reproductive healthcare delivery.

What emerges most clearly from this research is the disconnect between knowledge and behaviour. Women demonstrated reasonable awareness that irregular menstrual cycles signal PCOD (85.7% correct responses) yet continued engaging in dietary and physical activity patterns that directly worsen their condition. The finding that 64.3% incorrectly believed PCOD is completely curable reflects either inadequate patient counselling or selective retention of information that offers false hope. Similarly, one-

third of participants clung to the misconception that PCOD exclusively affects obese women, potentially preventing lean women from seeking timely medical attention.

The lifestyle data reveals a generation caught between awareness and action. Despite knowing the importance of diet and exercise, the vast majority skipped breakfast, consumed junk food regularly, and exercised infrequently. High stress levels affected over half the sample, creating a vicious cycle where stress exacerbates hormonal imbalances while PCOD symptoms generate additional psychological distress. The fact that 69% visited gynaecologists only when symptoms demanded attention rather than for routine preventive care suggests women continue to view reproductive health through a reactive rather than proactive lens.

The age-related knowledge gradient offers both concern and hope. Younger women under 20 demonstrated the poorest understanding, yet they represent the demographic most amenable to early intervention. Older women above 40 showed superior knowledge, likely accumulated through years of personal health experiences and healthcare encounters. This pattern suggests that waiting for knowledge to accrue naturally through life experience represents a missed opportunity for early prevention. Health information sources have shifted dramatically, with healthcare professionals now competing against artificial intelligence platforms and social media for attention. While 41% still prefer doctors as their primary information source, the combined 54.4% who turn to AI tools, social media, and online blogs raises questions about information accuracy and quality. Healthcare systems must adapt by establishing credible digital presences that can compete with less reliable sources. The overwhelming agreement (99%) that more awareness campaigns are needed reveals that women themselves recognize the educational deficit. This consensus across all demographic subgroups provides a mandate for public health action. However, campaigns must move beyond simple awareness to behavioural change, addressing the barriers that prevent women from translating knowledge into action. Time constraints, cultural factors, and economic limitations all require consideration in intervention design.

This study's limitations deserve acknowledgment. The online distribution method inherently favoured educated, urban women with internet access, potentially skewing findings toward higher knowledge scores and healthier behaviours than exist in the broader population. The reliance on self-reported PCOD status without clinical verification means prevalence figures must be interpreted cautiously. Nevertheless, the strong statistical associations and consistent patterns across multiple variables lend credibility to the core findings.

Moving forward, India requires a multi-pronged approach to address the PCOD burden. Medical curricula should emphasize thorough PCOD education for future healthcare providers. Public health campaigns should target schools, colleges, and workplaces where young women can be reached before symptoms develop. Affordable counselling services and lifestyle intervention programs should be integrated into primary healthcare settings. Most critically, the message must be clear: PCOD is manageable but not curable, affects women across all body types, and responds better to lifestyle changes than to medication alone.

The path forward demands collaboration between healthcare providers, educators, policymakers, and communities themselves. Women have made clear their desire for better information and support. The question now is whether healthcare systems will respond with the urgency this silent epidemic demands.

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Annexure:1 Questionnaire

Assessment of Knowledge and Awareness Regarding Polycystic Ovarian Disease (PCOD) Among Females in the General Population: A Questionnaire-Based Study

Section -1 (Demographics)

1. What is your age (years)?
   - <20
   - 20-30
   - >40

2. What is your marital status?
   - Unmarried
   - Married
   - Widowed
   - Divorced
   - Other

3. What is your occupation?
   - Student
   - Employed
   - Business
   - Homemaker
   - Other

4. What is your educational background?
   - No formal education
   - Primary school-middle school
   - Matriculation
   - High school
   - Diploma
   - Graduation
   - Post Graduation
   - Doctorate

5. What is your weight (in kgs)?
   - <45
   - 45-60
   - 60-75
   - Above 75

6. Are you suffering from PCOD?
   - Yes
   - No

7. Do you have genetic history of PCOD?
   - Yes
   - No

8. Do you have any other chronic diseases?
   - Yes
   - No

9. What diet do you prefer?
   - Vegetarian
   - Non-Vegetarian
   - Mixed
   - Vegan

10. What is your area of residence?
   - Urban
   - Rural

Section -2 (Perspective)

11. According to you, what is the health of your Face skin?
   - Clear
   - Have acne
   - Have facial hair
   - Have moon face

12. According to you, how is your skin's texture?
   - Normal or Mixed
   - Dry/Rough
   - Oily
   - Loss of moisture

13. What is your mensuration duration?
   - 2-3 days
   - 4-7 days
   - More than 7 days
   - Fluctuates too much

14. Is your menstrual cycle regular?
   - Yes
   - No

15. Do you face Hair problems like Hair fall or Hair thinning?
   - Yes
   - No

Section -3 (Lifestyle)

16. How often do you eat breakfast?
   - Daily
   - Twice a week
   - Thrice a week
   - I skip it almost everyday

17. How often do you eat junk food?
   - Daily
   - Twice a week
   - More than twice a week
   - Once a week
   - Very rare

18. Do you smoke or consume alcohol?
    - Only alcohol
    - Only smoke
    - Both
    - I do not smoke or consume alcohol

19. How often do you exercise?
    - Daily
    - Once a week
    - Twice a week
    - Very rarely

20. What is your stress level during the day?
    - Minimal
    - Average
    - I stress a lot

Section -4 (Knowledge)

21. Have you heard of PCOD before?
    - Yes
    - No

22. Do you think PCOD is curable completely?
    - Yes
    - No

23. Do you think PCOD affects fertility?
    - Yes
    - No
    - I don’t know

24. Do you think PCOD occurs in Obese people only?
    - Yes
    - No
    - I don’t know

25. Do you think Irregular menstrual cycles are a sign of PCOD?
    - Yes
    - No
    - I don’t know

Section -5 (Practices)

26. Are you taking any prescription medicines for the management of your PCOD?
    - Yes
    - No
    - I don’t have PCOD

27. Do you take any precaution medications for PCOD specifically?
    - Yes
    - No

28. How often do you consult to a gynecologist for routine checkup?
    - Every month
    - Every 2-4 months
    - Once in 6 months
    - Only when required

29. What resources do you usually prefer for getting information regarding PCOD?
    - Online resources like (Wikipedia, personal blogs)
    - Healthcare professional (Doctor, nurse, pharmacist)
    - Social media (Instagram, Facebook, you tube)
    - AI resources (ChatGPT, Gemini)

30. Do you believe there should be more campaigns to educate people about PCOD, due to many misconceptions about PCOD?
    - Yes, strongly agree
    - Somewhat agree
    - Disagree
    - Strongly disagree