



Research Article

# Lifestyle and Reproductive Risk Factors for Polycystic Ovary Syndrome Among College Students: A Cross-Sectional Study

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## I N F O

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## A B S T R A C T

**Introduction:** Polycystic Ovary Syndrome (PCOS) is one of the most common endocrine disorders affecting women and is estimated to occur in approximately 5–10% of women during their reproductive years. The rising prevalence of PCOS among young women has become an important public health concern.

**Method:** A cross-sectional survey was conducted to identify the risk factors of PCOS among undergraduate college girls at MMS College, Kerala. The conceptual framework of the study was based on the Health Belief Model<sup>2</sup>. A total of 108 undergraduate college girls were selected using a stratified random sampling technique, considering the stream of study as strata. Data were collected using a three-part tool comprising demographic and personal history, stress assessment using the Perceived Stress Scale<sup>3</sup> (PSS), and physical examination with standardized instruments to identify potential PCOS risk factors. In addition, a structured knowledge questionnaire and a structured practice rating scale were used to assess knowledge and practices. Data were analyzed using SPSS.

**Results:** The findings revealed that the most common risk factors among the participants were stress, hirsutism, androgenic alopecia, and acne, which are recognized clinical indicators associated with PCOS<sup>4</sup>. Most of the participants were found to have more than one risk factor. Knowledge regarding PCOS showed a significant association with the mother's occupation, year of study, religion, and previous information about PCOS. Practices related to prevention and management were significantly associated with the stream of study, family income, father's educational status, and alopecia ( $p < 0.05$ ). Stress levels were significantly associated with type of family and family history of menstrual irregularity, infertility, and obesity.

**Conclusion:** These findings highlight the importance of early identification of risk factors and awareness programs among young women for effective prevention and management of PCOS.

**Keywords:** Polycystic Ovary Syndrome, Lifestyle Risk Factors, Reproductive Health, College Students, Cross-Sectional Study



## Introduction

India has one of the largest and fastest-growing youth populations in the world, with adolescent girls constituting nearly one-fourth of this population<sup>5</sup>. Adolescence and early adulthood represent important transitional stages in a woman's life characterized by several physiological and reproductive changes. The development of secondary sexual characteristics, the establishment of regular menstrual cycles, and the attainment of reproductive capability are important milestones during this period. Any disturbance in these processes may lead to physiological, psychological, and social stress in a woman's life<sup>6</sup>.

Recently, rapid lifestyle changes such as unhealthy dietary habits, physical inactivity, increasing academic stress, and sedentary behavior have significantly influenced the reproductive health of young women. One of the major health conditions associated with these lifestyle changes is Polycystic Ovary Syndrome (PCOS), a common endocrine and metabolic disorder affecting women of reproductive age. PCOS is characterized by hyperandrogenism, ovulatory dysfunction, and the presence of polycystic ovaries. Although the exact etiology of PCOS is not fully understood, genetic predisposition, obesity, insulin resistance, and increased body mass index (BMI) have been identified as important contributing factors<sup>7</sup>.

PCOS is associated with several short-term and long-term health consequences. Women with PCOS are at increased risk of developing metabolic abnormalities such as insulin resistance, type 2 diabetes mellitus, metabolic syndrome, and cardiovascular diseases.<sup>4,8</sup> Furthermore, ovulatory dysfunction associated with PCOS contributes significantly to infertility and reproductive complications later in life.<sup>9</sup> Studies conducted in different parts of India have reported varying prevalence rates of PCOS. For instance, research from South India and Maharashtra reported prevalence rates of 9.13% and 22.5%, respectively, based on the Rotterdam diagnostic criteria<sup>7</sup>. Recent reports also indicate a rising trend of PCOS among young women in India, highlighting the growing public health burden of the condition.

The onset of PCOS may occur during adolescence, particularly among girls experiencing early pubertal changes such as pubarche and thelarche (onset of breast development in girls). However, lack of awareness, inadequate knowledge, and unhealthy lifestyle behaviors among young women contribute to delayed diagnosis and management of the condition. Early identification of lifestyle and reproductive risk factors is therefore essential for timely prevention and management of PCOS<sup>10</sup>. Although many adolescents seek medical attention mainly for cosmetic concerns such as acne, hirsutism, or menstrual irregularities, untreated PCOS

may lead to serious long-term complications, including infertility, metabolic syndrome, and diabetes.<sup>11</sup>

College students are particularly vulnerable to PCOS-related risk factors due to lifestyle transitions, academic stress, irregular dietary habits, and reduced physical activity. Therefore, the present cross-sectional study was conducted to assess the lifestyle and reproductive risk factors associated with PCOS among college students

## Objectives

1. To describe the demographic and family characteristics of undergraduate college girls.
2. To identify the lifestyle and reproductive risk factors associated with PCOS among undergraduate college girls.
3. To assess the level of stress among undergraduate college girls using the Perceived Stress Scale.
4. To determine the association between selected demographic variables and the lifestyle risk factors, knowledge, and practices related to PCOS.

## Materials And Methods

After obtaining administrative permission and ethical clearance from MMS College, Kerala, the study was conducted from 7 February 2022 to 17 February 2022. A total of 108 undergraduate college girls were selected using a stratified random sampling technique, with the stream of study considered a stratum.

Data were collected using three research tools designed to assess the lifestyle and reproductive risk factors, knowledge, and practices related to the prevention and management of polycystic ovary syndrome (PCOS) among undergraduate college students. The tools were validated by experts and were found to be reliable, clear, and feasible for data collection. The description, purpose, and technique of the tools used in the study are presented in Table 1.

**Table 1. Data Collection Tools and Techniques**

S NO	Tools	Purpose	Technique
1	TOOL-1 Risk Factor Assessment Proforma Section I Demographic data Section II PCOS risk factor assessment	To assess the background information of the subject To assess the risk factors of PCOS Part A - History taking Part B - Perceived stress assessment Part C – Physical examination	Questioning   Physical Assessment

2	TOOL 2 Structured Knowledge Questionnaire	To assess the knowledge regarding prevention and management of PCOS	Questioning
3	TOOL 3 Practice rating scale	To assess the practice regarding prevention and management of PCOS	Questioning

## Description of Risk Factor Assessment (Tool I)

### Part A: Personal and Family History

This section consisted of 11 items related to the personal and family history of the participants. Information was collected regarding factors such as family history of PCOS, infertility, menstrual irregularities, metabolic disorders, and obesity in the family.

### Part B: Assessment of Stress

This section consisted of 10 items used to assess the level of stress among the participants using the standardized Perceived Stress Scale (PSS). The total score ranges from 0 to 40, where a higher score indicates a higher level of perceived stress.

The stress levels were categorized as follows:

- 0–13: Low perceived stress
- 14–26: Moderate perceived stress
- 27–40: High perceived stress

### Part C: Physical Examination and Biophysical Measurements

This section consisted of 11 items designed to identify the risk factors of PCOS among undergraduate college girls. Physical examination and anthropometric measurements were conducted by the researcher, and the findings were recorded in the structured questionnaire.

The physical assessment included the following measurements:

- Height, measured using a height scale
- Weight, measured using a weighing machine
- Body Mass Index (BMI), calculated using height and weight measurements
- Waist circumference, measured using a measuring tape
- Hip circumference, measured using a measuring tape
- Waist–hip ratio, calculated from waist and hip circumference measurements
- Assessment of acne using Pillsbury Acne Grading System
- Assessment of hirsutism using the Modified Ferriman–Gallwey Hirsutism Scale

- Assessment of androgenic alopecia using the Ludwig Visual Score
- Assessment of menstrual irregularity based on the Rotterdam Criteria for irregular menstrual cycles among adolescents

### Data collection

Data were collected after obtaining written informed consent from the participants and assuring confidentiality and anonymity. Anthropometric measurements, including height, weight, waist circumference, and hip circumference, were recorded using appropriate instruments. PCOS risk factors were assessed using the Risk Factor Assessment Proforma, while knowledge and practices regarding PCOS prevention and management were assessed using the Structured Knowledge Questionnaire and Practice Rating Scale. The collected data were coded, organized, and analyzed using descriptive and inferential statistics according to the study objectives and hypotheses.

### Results

The percentage distribution of demographic characteristics of undergraduate college girls showed that the majority of students (57.40%) were in the age group of 19–20 years, followed by 26.90% in the age group of 17–18 years. An equal proportion of students (33.3% each) were selected from arts, commerce, and science streams and from first, second, and third year, using the stream of study as strata. The majority (94.5%) of the students were non-vegetarian.

Regarding lifestyle and reproductive risk factors, 62.96% of the students had central obesity, 41.67% were physically inactive, 33.33% were overweight or obese, and 30.56% reported unhealthy eating habits. In addition, 24.07% had irregular menstrual cycles, 15.74% reported a family history of PCOS, and 11.11% had metabolic disorders such as diabetes.

Family characteristics revealed that 45.9% of the participants had a monthly family income of less than ₹10,000, whereas 27.50% had a family income of more than ₹31,000. The majority (82.60%) belonged to nuclear families. Most fathers (37.96%) and mothers (40.40%) had education up to the higher secondary level.

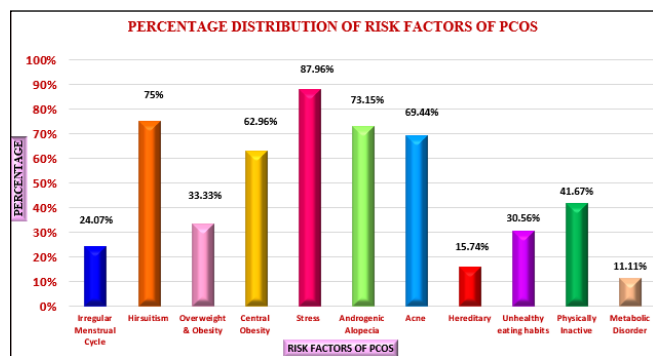
The distribution of risk factors showed that 87.96% of students experienced stress, 75% had hirsutism of varying degrees, 73.15% had androgenic alopecia, and 69.44% had acne in different grades. These findings indicate that the most common risk factors were stress, hirsutism, androgenic alopecia, and acne, and many students exhibited more than one risk factor.

Statistical analysis revealed that stress level was significantly associated with type of family ( $\chi^2=12.840$ ), family history of menstrual irregularity ( $\chi^2=10.573$ ), infertility ( $\chi^2=5.966$ ),

and obesity ( $\chi^2=6.965$ ). Central obesity showed a significant association with dietary pattern ( $\chi^2=9.930$ ) at  $p < 0.05$ . BMI was significantly associated with unhealthy eating habits ( $\chi^2=13.316$ ), hirsutism ( $\chi^2=40.959$ ), and central obesity ( $\chi^2=23.803$ ).

A significant association was also found between mother's educational status and family income ( $\chi^2 = 12.484$ ) and father's educational status ( $\chi^2 = 42.297$ ) at  $p < 0.05$ . Religion showed a significant association with family history of diabetes mellitus ( $\chi^2 = 11.090$ ) and alopecia ( $\chi^2 = 9.913$ ).

Knowledge regarding PCOS was significantly associated with religion ( $\chi^2=9.658$ ), mother's occupation ( $\chi^2=10.634$ ), year of study ( $\chi^2=9.272$ ), and previous information regarding PCOS ( $\chi^2=6.720$ ) at  $p < 0.05$ . Similarly, practices related to the prevention and management of PCOS showed a significant association with the stream of study ( $\chi^2=7.188$ ), family income ( $\chi^2=6.704$ ), father's educational status ( $\chi^2=7.956$ ), and alopecia ( $\chi^2=9.329$ ).



**Figure 1.** Column chart showing the percentage distribution of Undergraduate college girls according to the risk factors of PCOS

## Discussion

The present study aimed to identify the lifestyle and reproductive risk factors associated with Polycystic Ovary Syndrome (PCOS) among undergraduate college girls in a selected college in Kerala. The findings of the study revealed that the most common risk factors among the participants were stress, hirsutism, androgenic alopecia, and acne. In addition, many undergraduate college girls were found to have more than one or two risk factors, indicating an increased vulnerability to the development of PCOS. These findings highlight the growing impact of lifestyle-related factors and hormonal manifestations among young women.

The results of the present study are consistent with the findings reported by Youngwanichsetha et al., which indicated that unhealthy lifestyle behaviors such as poor dietary habits, physical inactivity, and psychological stress contribute significantly to overweight, obesity, insulin resistance, hyperinsulinemia, and hyperandrogenism, which are recognized risk factors for the development of

polycystic ovary syndrome among women.

Similarly, the findings of the present study are supported by the research conducted by Budharam and Veeramreddy et al. (2019), which reported that 26.9% of girls aged 16–20 years and 36.4% of girls aged 21–25 years exhibited symptoms suggestive of PCOS. This highlights the increasing occurrence of PCOS symptoms among adolescents and young women, emphasizing the importance of early identification and preventive measures.<sup>13</sup>

The presence of multiple lifestyle and reproductive risk factors among undergraduate college students indicates the need for early screening, increased awareness, and promotion of healthy lifestyle practices to reduce the risk of PCOS and its long-term complications.

## Conclusion

The findings of the present study highlight the need for increased awareness and education regarding Polycystic Ovary Syndrome (PCOS) among females of reproductive age, particularly for early identification of risk factors and timely management. PCOS is one of the most common endocrine disorders affecting women during their reproductive years, and the presence of multiple lifestyle and reproductive risk factors among undergraduate college girls indicates the growing magnitude of the problem. The study revealed that many participants had one or more risk factors associated with PCOS, such as stress, central obesity, unhealthy dietary habits, and menstrual irregularities. The results underscore the importance of preventive strategies focused on risk-factor identification and lifestyle modification among young women. Healthcare professionals, especially nurses working in gynecology and community health settings, have an important role in educating young women about lifestyle modification, prevention, and management of PCOS. Educational institutions such as schools and colleges can serve as effective platforms for promoting health awareness. Community health nurses can also organize health education programs and awareness campaigns to encourage early detection and healthy lifestyle behaviors among adolescents and young women.

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