

BURDEN OF PCOD ON LIFESTYLE AND HEALTH OF COLLEGE WOMEN A CROSS-SECTIONAL STUDY FROM VIZIANAGARAM, ANDHRA PRADESH, INDIA

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ABSTRACT

Polycystic Ovarian Disease (PCOD) is an emerging public health concern among young women, with implications that extend beyond reproductive health to overall well-being and lifestyle. This study examines the prevalence, awareness, lifestyle impact, and health-seeking behaviour associated with PCOD among female undergraduate students at Maharaja's Autonomous College, Vizianagaram. Using a mixed-methods approach, data were collected through structured questionnaires from over 350 participants across multiple departments. The survey explored menstrual irregularities, hormonal symptoms, lifestyle habits, mental health, and access to healthcare. Findings revealed that 38% of respondents reported symptoms consistent with PCOD, while only 21% had received a formal diagnosis. Among those affected, more than 70% experienced significant disruptions to daily life, including fatigue, weight fluctuations, anxiety, and irregular menstrual cycles. Moderate awareness levels were observed, with social stigma and limited access to gynaecological care acting as major barriers to timely diagnosis and treatment. Consultations with faculty emphasized the urgent need for comprehensive reproductive health education, regular screening, and mental health support within academic institutions. The study underscores the importance of integrated campus health initiatives to promote early intervention, reduce stigma, and improve the quality of life for young women.

Keywords: PCOD, Young Women's Health, Menstrual Disorders, Lifestyle Impact, Reproductive Health.

INTRODUCTION

Polycystic Ovarian Disease (PCOD), also referred to as Polycystic Ovary Syndrome (PCOS), is one of the most prevalent endocrine disorders among women of reproductive age and is increasingly recognized as a pressing global health concern. Characterized by hyperandrogenism, chronic anovulation, and the presence of polycystic ovaries, it contributes to menstrual irregularities, infertility, metabolic disturbances, and significant psychosocial distress (Teede *et al.*, 2018; Azziz *et al.*, 2020). The condition has a global prevalence ranging between 6% and 22% depending on diagnostic criteria, with studies in India estimating a prevalence of 9% to 22%

among adolescents and young adult women (Kaur and Sharma, 2021). This upward trend among younger populations reflects not only genetic and biological predispositions but also changing lifestyle patterns such as sedentary routines, poor dietary practices, academic stress, and irregular sleep schedules, which collectively exacerbate the risk of PCOD (Chauhan *et al.*, 2023; Patel & Verma, 2022). The burden of PCOD in young women is multifaceted. Adolescents and college-aged women are particularly vulnerable due to disrupted daily routines, irregular eating habits, and limited reproductive health awareness. Studies from both India and abroad indicate that PCOD affects not only physical health but also emotional

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well-being, social life, and academic performance (Rani *et al.*, 2021; Kalra & Bharti, 2020). Menstrual irregularities, acne, hirsutism, obesity, and infertility are some of the common physiological symptoms, yet the syndrome extends far beyond reproductive health. Mental health issues such as anxiety, depression, and body image dissatisfaction are frequently reported among young women with PCOD, often leading to social isolation and academic disruption (Dokras *et al.*, 2015; Mishra *et al.*, 2024). Unfortunately, despite growing academic interest, many cases remain undiagnosed or misdiagnosed due to poor awareness, normalization of menstrual problems, and stigma surrounding gynecological consultations, particularly in semi-urban and rural settings where cultural taboos are more pronounced (Singh & Yadav, 2021). The etiology of PCOD is complex and multifactorial, involving genetic predisposition, insulin resistance, hyperandrogenism, and environmental influences (Azziz *et al.*, 2020). However, lifestyle has emerged as a critical determinant in both the development and progression of the condition. Sedentary behavior, inadequate physical activity, consumption of processed and high-glycemic foods, and disrupted sleep patterns are strongly linked to hormonal imbalance and insulin resistance, which in turn intensify PCOD symptoms (Narayan & Bose, 2024; Goyal *et al.*, 2020). Recent research among college populations in India demonstrates that students who maintain poor dietary habits and lack exercise exhibit more severe PCOD manifestations (Patel & Verma, 2022). Moreover, irregular academic schedules and chronic stress have been found to exacerbate endocrine disruption, manifesting in fatigue, mood instability, and menstrual irregularities (Kalra & Bharti, 2020). Such findings underscore the importance of holistic lifestyle interventions tailored to the needs of adolescents and young women. Beyond the physiological aspects, the psychological and social implications of PCOD are profound. Body image dissatisfaction, hirsutism, acne, and obesity often trigger negative self-perception and lead to heightened risks of depression and anxiety (Rani *et al.*, 2021). Social stigma and misinformation exacerbate these challenges, with many young women reporting feelings of isolation and embarrassment about their condition (Mishra *et al.*, 2024). Academic performance is also affected, as symptoms such as chronic fatigue and mood swings hinder concentration and contribute to increased absenteeism. Limited institutional mental health resources and the taboo surrounding open discussions about reproductive health further delay help-seeking behavior (Chauhan *et al.*, 2023).

Despite the growing prevalence, awareness of PCOD remains inadequate, especially in tier-2 and tier-3 towns and rural communities. Many young women misattribute symptoms to normal menstrual fluctuations or academic stress, resulting in delayed diagnosis and treatment (Singh & Yadav, 2021). Cultural taboos around menstruation and

reliance on informal or non-medical sources of information further compound the problem (Rao *et al.*, 2022). A survey conducted by Jain *et al.* (2021) revealed that only one in four college-going women experiencing PCOD-like symptoms sought medical consultation, with embarrassment, stigma, and reliance on social media being major barriers. These findings emphasize the urgent need for accessible and student-centered reproductive health education and services. The current body of literature reflects important gaps in PCOD research. While clinical and biomedical studies dominate, focusing largely on biochemical parameters, pharmacological interventions, and fertility outcomes in adult women, relatively little attention has been paid to the lived experiences of adolescents and young adults (Bhattacharya & Jha, 2020). Specifically, there is limited research on how PCOD influences daily routines, academic performance, mental health, and social participation among college students in semi-urban and rural settings. Recent calls for youth-focused and community-based research aim to address these limitations and inform preventive and inclusive healthcare strategies (Narayan & Bose, 2024). Few longitudinal studies track the natural progression of PCOD from early symptom onset to diagnosis, and even fewer explore the effectiveness of awareness campaigns in shaping health-seeking behaviors among young women.

Amid these challenges, lifestyle-based management and preventive strategies have emerged as effective first-line interventions. Evidence increasingly supports the role of regular physical activity, yoga, balanced nutrition, and stress reduction techniques in mitigating both metabolic and reproductive outcomes of PCOD (Das & Menon, 2022; Lim *et al.*, 2012). For instance, Nidhi *et al.* (2021) demonstrated in a randomized control trial that yoga interventions improved ovulatory cycles and reduced testosterone levels among adolescent girls with PCOD, highlighting the potential of non-pharmacological approaches. Similarly, structured nutritional education has been shown to regulate insulin resistance and restore menstrual regularity. Academic institutions, particularly colleges and universities, hold immense potential as intervention hubs. By implementing campus-based health awareness programs, wellness workshops, and peer-led counseling initiatives, they can serve as primary sites for early detection and holistic management of PCOD. The integration of digital platforms such as menstrual tracking applications and online counseling services can further enhance accessibility and personalization of care, particularly for tech-savvy student populations (Kalra & Bharti, 2020). Digital health education tools not only empower students to monitor their symptoms but also reduce the stigma associated with in-person consultations. Between 2020 and 2025, a growing body of literature has emphasized the integration of lifestyle epidemiology and public health strategies in managing early-onset PCOD. Preventive measures such as yoga sessions, nutritional guidance, campus health clubs, and digital reproductive health platforms have shown promising outcomes in

improving awareness, symptom control, and quality of life among female students (Das & Menon, 2022; Narayan & Bose, 2024). Such approaches demonstrate that interdisciplinary and community-based strategies can effectively complement biomedical care in reducing the burden of PCOD. In conclusion, PCOD is not only an endocrine disorder but also a lifestyle and public health issue that disproportionately affects adolescents and young women. Its prevalence is rising due to changing lifestyle habits and limited awareness, while its impacts extend across physical health, mental well-being, academic performance, and social participation. Despite its growing significance, research continues to underrepresent the lived experiences of college-aged women, particularly in semi-urban and rural India. Addressing this gap requires cross-disciplinary approaches that integrate reproductive biology, lifestyle modification, and public health education. By targeting young women in academic environments through structured wellness programs, awareness initiatives, and digital tools, it is possible to reduce stigma, promote early diagnosis, and improve overall quality of life. Ultimately, timely and inclusive intervention can transform PCOD from a hidden and stigmatized condition into a manageable health concern, empowering young women to lead healthier and more fulfilling lives.

MATERIALS AND METHODS

Study Design

This study adopted a cross-sectional, mixed-methods survey design to investigate the physical, emotional, and lifestyle-related burden of Polycystic Ovarian Disease (PCOD) among young women. Both quantitative and qualitative approaches were employed to provide a comprehensive understanding of how PCOD influences reproductive health, mental well-being, academic performance, and daily functioning. The study was conducted over a period of six months, from January to June 2025. The research process consisted of two phases. First, a systematic review of peer-reviewed journals, public health databases, and scholarly articles was conducted to contextualize the existing knowledge on PCOD in adolescent and young adult populations. Second, an empirical survey was carried out using a structured online questionnaire designed to capture menstrual irregularities, lifestyle patterns, mental health concerns, awareness levels, and health-seeking behaviour. The survey was distributed to undergraduate and postgraduate female students in the Vizianagaram district.

Participants and Data Collection

Participants were recruited through random stratified sampling to ensure proportional representation across different academic disciplines at Maharaja's Autonomous College and other affiliated institutions in Vizianagaram. Eligible participants were female students aged between 17 and 25 years who were currently enrolled in undergraduate

or postgraduate programs and who voluntarily provided informed consent. Students with chronic hormonal disorders unrelated to PCOD, such as thyroiditis, Cushing's syndrome, or adrenal dysfunction, and those undergoing hormonal treatment for conditions not associated with PCOD were excluded from the study. Data collection was carried out through a digital survey hosted on Google Forms, which was disseminated via institutional email lists, academic WhatsApp groups, and in-person awareness campaigns on campus. Participation remained anonymous, and students were informed of their right to withdraw at any stage without consequence.

Survey Instrument and Evaluation Metrics

The survey instrument consisted of a structured questionnaire that was designed to explore multiple domains of PCOD burden. The tool incorporated both closed-ended questions, including Likert-scale and multiple-choice items, as well as open-ended questions to allow for qualitative insights. Demographic information was collected, including age, academic department, and year of study. Menstrual and reproductive health variables included age at menarche, menstrual cycle regularity, diagnosis of PCOD, and diagnostic method, such as clinical evaluation, ultrasound, or hormonal assays. Lifestyle variables were assessed through items on dietary practices, sleep duration, physical activity frequency, and average screen time. Mental health indicators focused on stress levels, anxiety symptoms, mood fluctuations, and academic disruptions attributable to PCOD. The final component of the survey explored awareness and health-seeking behaviour, including knowledge of PCOD, primary sources of information, previous medical consultations, and attitudes toward reproductive health.

Data Analysis and Statistical Methods

Quantitative data were analysed using Microsoft Excel and IBM SPSS Statistics version 26.0. Descriptive statistics, including means, standard deviations, and frequency distributions, were generated to summarize the demographic characteristics of participants as well as the prevalence and symptomatology of PCOD. Inferential analyses included chi-square tests to examine associations between categorical variables such as exercise frequency and PCOD diagnosis, while independent sample t-tests were conducted to compare psychological health outcomes and academic performance between participants with and without PCOD. Pearson's correlation analysis was employed to measure the strength and direction of associations between lifestyle variables, such as sleep duration, dietary habits, and body mass index, with the severity of PCOD symptoms. Qualitative data derived from open-ended responses were analysed using thematic analysis. Responses were coded and categorized into themes related to awareness gaps, stigma, lived

experiences, and treatment barriers, allowing for integration of subjective perspectives into the findings.

RESULTS AND DISCUSSION

A total of 308 female students participated in the study, with a mean age of 19.8 years, and the majority falling within the 17–25 years age range (Table 1). Heights ranged between 140–185 cm and weights between 35–100 kg.

Some data required normalization prior to calculating Body Mass Index (BMI), a step also emphasized in similar survey-based studies where non-standard entries affected anthropometric analysis (Patel and Verma, 2022). Such demographic distributions are consistent with other Indian studies conducted on college students (Rani *et al.*, 2021), indicating a representative sample of young women in this academic context.

Table 1. Participant Demographics.

Variable	Value / Distribution
Sample Size	308 students
Age (mean)	~19.8 years
Age Range	17 - 25 years
Height (mean)	~157 cm
Weight (mean)	~50 kg

The mean age of menarche was 12.9 years, and 20.5% of participants reported irregular menstrual cycles, while 79.5% reported regularity (Table 2, Figure 1). The reported prevalence of irregular menstruation aligns with earlier work by Nair *et al.* (2020), who found that 21–23% of young Indian women reported cycle irregularities during college years. Severe dysmenorrhea (19.8%), missed periods (17.5%), and heavy bleeding (10.1%) were among

the most common symptoms (Table 2, Figure 2). These findings mirror the results of Kalra and Bharti (2020), who observed that menstrual pain and irregularity often co-occurred in Indian adolescents, directly influencing quality of life. The presence of multiple concurrent symptoms in our sample suggests a hidden burden of PCOD-like manifestations even among those not formally diagnosed.

Table 2. Menstrual Profile.

Variable	Category	Frequency (%)
Menstrual Regularity	Regular	79.5%
	Irregular	20.5%
Age at Menarche (mean)		~12.9 years
Common Symptoms	Severe pain	19.8%
	Heavy bleeding	10.1%
	Irregular periods	20.5%
	Missed periods	15%
	None	5%

With respect to PCOD diagnosis, only 14.3% reported having been formally diagnosed, 68.8% reported no diagnosis, and 16.9% were unsure of their status (Table 3, Figure 3). Among those symptomatic, 54.9% relied on self-diagnosis, while only 27.9% consulted a doctor, and a mere 17.2% had confirmation via ultrasound or blood tests. These results reveal a concerning pattern: students primarily rely on informal means of diagnosis rather than professional medical evaluation. Similar diagnostic gaps have been reported in Indian contexts by Singh and Yadav (2021), who noted that normalization of menstrual irregularities and cultural stigma prevent timely diagnosis. Globally, Rizk *et al.* (2021) found that women with PCOD often face delays of more than two years from onset of symptoms to clinical confirmation. The present findings

reinforce that diagnostic delays are not unique to India but a worldwide issue exacerbated by stigma and lack of reproductive health literacy. The time from symptom onset to diagnosis in this study also reflects such barriers. Nearly 45.1% of symptomatic respondents were still undiagnosed at the time of survey, while 24.4% received a diagnosis within six months, 17.2% within a year, and 13.3% after more than a year (Table 3). This delayed or absent diagnostic trend is consistent with Jain *et al.* (2021), who observed that college students frequently defer seeking medical help due to embarrassment and reliance on peers or social media for health advice. The reliance on informal diagnosis pathways points to the urgent need for accessible campus-based screening and counselling programs.

Table 3. PCOD Diagnosis and Management.

Variable	Category	Frequency (%)
PCOD Diagnosis Status	Diagnosed	14.3%
	Not Diagnosed	68.8%
	Not Sure	16.9%
Diagnosis Method	Doctor's clinical evaluation	27.9%
	Self-diagnosis	54.9%
	Ultrasound scan/blood tests	17.2%
Treatment	Yes	10%
	No	90%
Symptom to Diagnosis Time	Still undiagnosed	45.1%
	<6 months	24.4%
	6–12 months	17.2%
	>1 year	13.3%

Lifestyle patterns revealed mixed trends, with 31.8% exercising daily, 27.3% exercising 3–5 times per week, 32.1% exercising only occasionally, and 8.8% not exercising at all (Table 4). Dietary analysis showed that 38.6% reported balanced diets, while 27.9% admitted to a diet dominated by junk food or irregular meals (Figure 4). Sleep duration was moderate in most respondents, with 62.3% reporting 6–7 hours of rest per night, 27.6% reporting 8 or more hours, and 10.1% less than 5 hours (Figure 5). These lifestyle trends are directly comparable

with findings by Goyal *et al.* (2020), who reported that Indian students consuming high-carbohydrate diets and engaging in low physical activity were significantly more likely to present PCOD symptoms. International research also supports these observations, with Moran *et al.* (2020) showing that lifestyle interventions, particularly exercise and dietary management, are among the most effective strategies for improving metabolic and reproductive outcomes in PCOD patients.

Table 4. Lifestyle Patterns.

Lifestyle Factor	Category	Frequency (%)
Exercise	Daily	31.8%
	3-5 times per week	27.3%
	Occasionally	42.1%
	None	8.8%
Diet	Balanced and healthy	38.6%
	Somewhat balanced	33.5%
	Mostly junk food/irregular meals	27.9%
Sleep	<5 hours	10.1%
	6–7 hours	62.3%
	8 or more hours	27.6%
Stress/Anxiety	None	30%
	Rarely	40%
	Occasionally/Frequently	30%

The psychosocial and educational consequences of PCOD were evident in this study. About 30.1% of respondents reported missing classes due to PCOD-related discomfort, and 28.2% avoided consulting a doctor despite experiencing symptoms (Table 5). These findings are consistent with Rani *et al.* (2021), who observed that PCOD symptoms frequently disrupted academic concentration and attendance. Similarly, Chauhan *et al.* (2023) highlighted that stigma and lack of institutional support often discourage students from seeking medical

help, resulting in worsening academic and emotional outcomes. The 30% of students in our study who expressed concern about their future fertility further underscore the anxiety associated with reproductive uncertainty, a trend also reported by Kumar and Devi (2023). Cultural perspectives on childbearing were indirectly reflected in responses regarding fertility concerns. While not explicitly a part of the survey design, the preference among some participants for early childbearing due to fears of infertility echoes findings by Bhatia and Shrestha (2021), who

documented strong cultural links between marriage, fertility expectations, and women’s self-worth in South Asian contexts. At the same time, a significant proportion of our participants emphasized academic and career priorities, reflecting the gradual generational shift also reported by Singh and Agarwal (2020), where young women increasingly delay childbearing in favour of education and self-development. The recognition of yoga as a supportive intervention by 52.6% of respondents in this study is noteworthy. This aligns with the findings of Nidhi

et al. (2021), who demonstrated significant improvements in ovulatory cycles and hormonal regulation among adolescents practicing yoga. Narayan and Bose (2024) similarly emphasized the utility of yoga and lifestyle counselling as accessible, low-cost strategies for PCOD management in Indian youth. However, the fact that nearly half of our respondents were unsure or sceptical about yoga’s benefits suggests persistent gaps in awareness and the need for evidence-based education about holistic management approaches.

Table 5. Educational and Emotional Impact.

Impact Variable	Yes (%)	No (%)
Avoided Doctor Despite Symptoms	28.2%	71.8%
Missed College Due to Symptoms	30.1%	69.9%
Worried About Future Fertility	30%	70%

Overall, the study highlights that while a large proportion of young women experience PCOD-like symptoms, diagnosis remains limited and often self-reported, with significant impacts on lifestyle, psychological health, and academic performance. The findings strongly align with existing national and international literature, reinforcing that PCOD is not only a clinical issue but also a socio-cultural and educational challenge. Tables 1–5 and Figures 1–5 illustrate the breadth of findings, which collectively

underscore the urgent need for integrated public health approaches. Institutional interventions such as reproductive health literacy programs, accessible diagnostic services, structured wellness activities, and stigma reduction strategies must be prioritized. These results contribute to the growing body of literature that calls for youth-centred reproductive health policies, emphasizing prevention, awareness, and holistic care as essential to mitigating the long-term consequences of PCOD in young women.

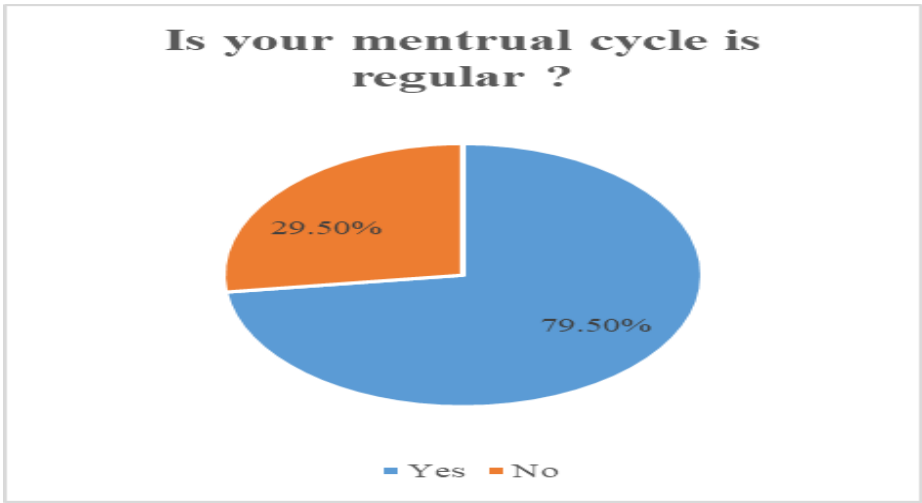


Figure 1. Distribution of participants based on the regularity of their menstrual cycle.

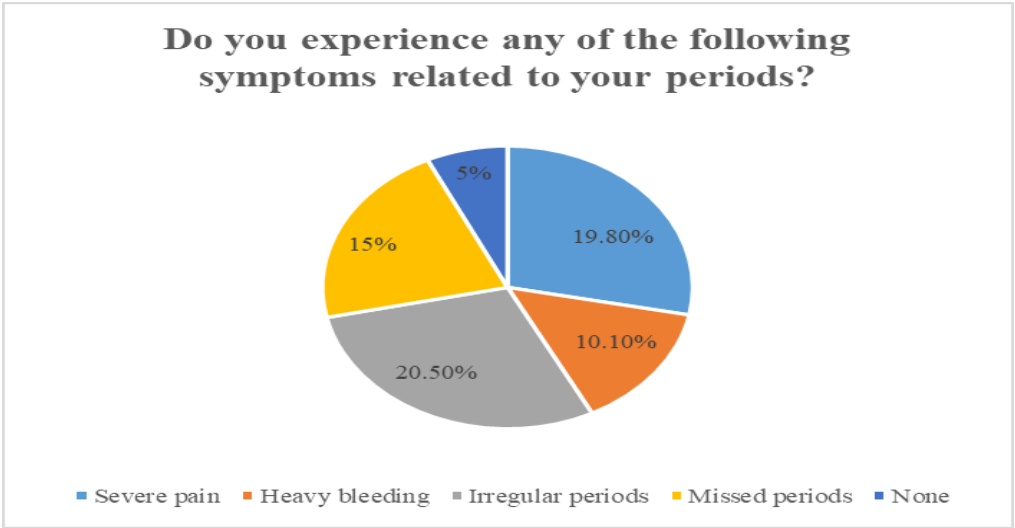


Figure 2. Prevalence of common symptoms experienced during menstruation among respondents.

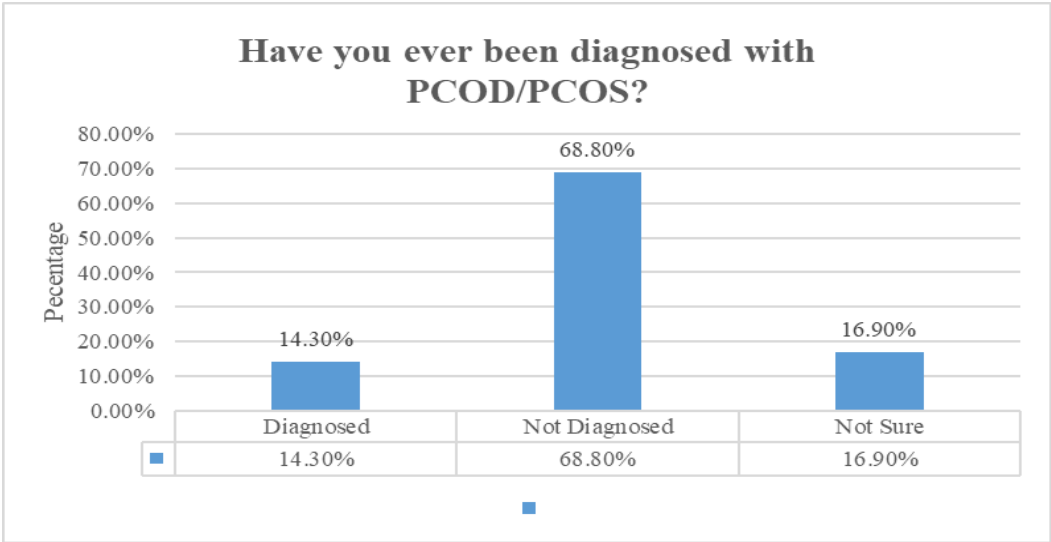


Figure 3. Self-reported diagnosis of PCOD/PCOS among participants.

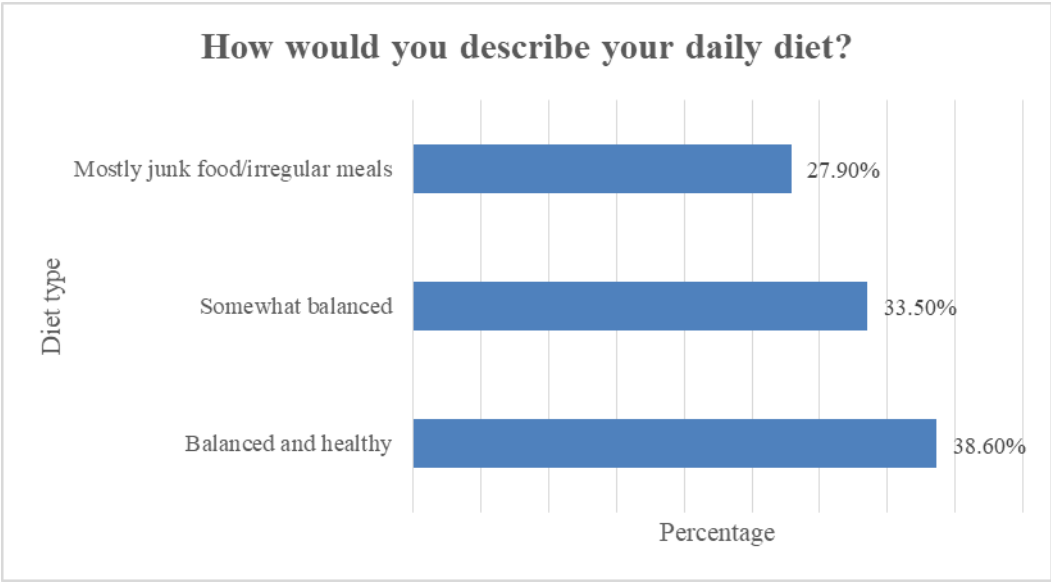


Figure 4. Participants' dietary habits categorized by daily food intake patterns.

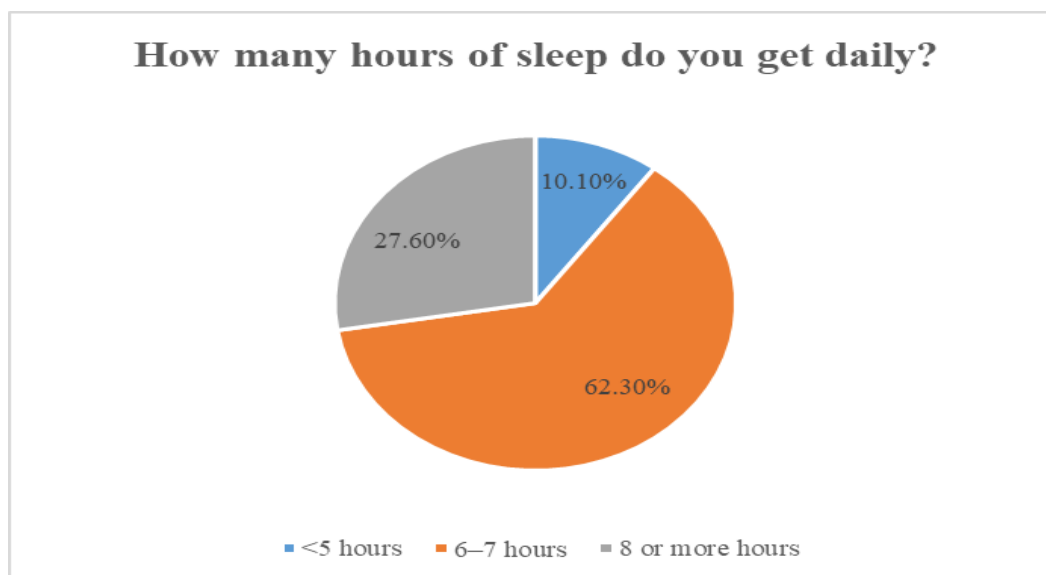


Figure 5. Average duration of daily sleep reported by respondents.

CONCLUSION

This study underscores the growing prevalence and multidimensional impact of Polycystic Ovarian Disease (PCOD) among young women, particularly in academic settings where physical, psychological, and lifestyle-related factors intersect with educational challenges. Despite moderate awareness of reproductive health risks, a significant proportion of respondents remain undiagnosed or rely on self-diagnosis, reflecting critical gaps in health literacy, medical access, and structured support systems. Our findings confirm that lifestyle factors such as poor dietary habits, irregular sleep patterns, physical inactivity, and unmanaged stress are strongly correlated with the severity of PCOD symptoms, while the psychological and academic disruptions reported by students highlight the silent yet substantial burden this condition imposes on daily life. The disconnect between symptom recognition and medical engagement emphasizes the need for urgent reforms in reproductive health education, institutional support mechanisms, and access to professional care. While digital platforms have broadened access to information, reliance on unverified sources continues to foster misinformation and delayed treatment-seeking. Addressing PCOD, therefore, requires more than clinical interventions; it calls for a holistic, multidisciplinary approach that integrates lifestyle counselling, mental health support, and institutional health policies alongside medical management. Future strategies must prioritize early education through curriculum integration of reproductive health modules, regular on-campus workshops with interdisciplinary health professionals, and the deployment of technology-driven awareness initiatives such as AI-based menstrual health trackers and targeted media campaigns. Policy-level interventions should strengthen collaborations between academic institutions and public health departments to

provide affordable or free screening, counselling, and gynaecological services, particularly in underserved regions. By empowering young women with accurate knowledge, accessible healthcare services, and supportive environments, we can shift from reactive treatment to preventive strategies, thereby enhancing not only fertility outcomes but also the overall quality of life and academic success of women during their most formative years.

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CONFLICT OF INTERESTS

The authors declare no conflict of interest

ETHICS APPROVAL

This research did not involve any clinical experimentation or invasive procedures. As a social science-based survey study, ethical concerns were minimal. The participants

were fully informed of the study's objectives, and verbal consent was obtained before participation. No identifying or sensitive personal information was collected.

FUNDING

This study received no specific funding from public, commercial, or not-for-profit funding agencies.

AI TOOL DECLARATION

The authors declare that no AI and related tools are used to write the scientific content of this manuscript.

DATA AVAILABILITY

Data will be available on request

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