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# Knowledge and awareness of polycystic ovarian syndrome among female undergraduates in a selected private university: A descriptive study

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## Abstract

**Objectives:** This study assessed the knowledge and awareness of polycystic ovary syndrome (PCOS) among female undergraduates at a selected private university in Nigeria.

**Method:** The study utilised a cross-sectional descriptive design. Multistage sampling was used to select the specific settings, resulting in 413 sampled respondents. A pretested instrument was used in collecting the data. Descriptive and inferential (Pearson correlation) statistics were used to analyse data at 5% level of significance.

**Results:** Findings revealed that 61.4% of respondents demonstrated average knowledge, and 63.4% showed high awareness of PCOS. A positive correlation was found between awareness and knowledge ( $r = 0.351$ ;  $p < 0.05$ ). There were significant differences in the level of knowledge between the social and health sciences students (Mean diff. = 2.609,  $p < 0.05$ ), and the level of awareness between 200-level and 500-level female undergraduates (Mean diff. = 0.44,  $p < 0.05$ ).

**Conclusion:** This study emphasises the importance of continuous health education, early intervention, and multidisciplinary collaboration to improve understanding, early diagnosis and management of PCOS among female undergraduates.

**Keywords:** Awareness, Knowledge, Female undergraduates, Polycystic Ovarian Syndrome

## Plain English Summary

This study explored how much female university students know about polycystic ovarian syndrome (PCOS), a common hormonal condition that affects women's health and fertility. The results showed that the students' course and level of study influenced their understanding of the disease.

Overall, the study shows that more information about PCOS is needed in all fields of study. Furthermore, improving awareness and understanding can help young women identify symptoms early, seek proper care, and live healthier lives.

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## Background

Polycystic Ovarian Syndrome (PCOS) has been recognised as one of the leading hormonal and metabolic disorders among adolescent girls and women of childbearing age. It is a complicated condition with multiple underlying causes manifesting as an accumulation of ovarian cysts, metabolic disorders, persistent anovulation, and excessive androgen production; primarily originating in the ovaries and linked to insulin resistance (1, 2).

Globally, PCOS affects approximately 8-13% women of reproductive age, defined as women between 15 and 49 years old (3). This condition is particularly significant for female undergraduates (women pursuing a bachelor's degree at a college or university) because they are a subset of the childbearing age population.

Globally, the prevalence of PCOS among female undergraduates is estimated at 2.2% and can be as high as 26% (4). In Nigeria, there is a paucity of data on the prevalence of PCOS among female undergraduates; although some studies have investigated PCOS in various demographic groups within the country. Among women of childbearing age, PCOS had a prevalence of 16.5% (n=200), especially between the ages of 27 and 31 years (5). A study involving 421 infertile premenopausal women in Benin City reported a prevalence rate of 16.9%, using the Rotterdam and AES criteria for diagnosis (6). According to Jahnavi et al (7) there is a rising incidence of PCOS among adolescents that is linked to obesity. Despite the rising incidence, there is little knowledge of the disease among the adolescents who are predominant in the university settings (8).

Studies have reported different degrees of knowledge and awareness around the world. A study conducted in Pune City, India, on the knowledge of PCOS among 100 undergraduate participants found that 73% of them had average knowledge, while another study in Mumbai involving 500 women aged 18 to 30 revealed that only 38% had heard of PCOS (9, 10). Similarly, a study conducted in an institution in Southwestern Nigeria showed that 56.8% of women between the ages of 21 and 25 had never heard of PCOS (11). The lack of knowledge is linked with the rapid increase in PCOS diagnoses in recent years, resulting in complications as it delays diagnosis and treatment (8), as knowledge is important to make health-seeking decisions.

It was important to focus on female undergraduates in the current study setting because of the prevalence of affluent students who may have lifestyle and eating habits that predispose them to

obesity (12). Furthermore, private universities operate open discussions about reproductive health and foster an environment where female students feel comfortable discussing and asking questions about PCOS. Affluent lifestyles, characterised by high-energy diets, reduced physical exertion, and screen-based leisure, have been shown to increase adiposity and metabolic dysregulation, thereby heightening susceptibility to PCOS (12). This makes private university settings an important focus for preventive education

Hence, this study assessed the knowledge and awareness of polycystic ovarian syndrome among female undergraduates in a private university in Nigeria. Specifically, the study objectives are:

1. to determine the level of knowledge of PCOS; and

2. to examine the level of awareness about PCOS

We hypothesised that there is no relationship between knowledge and awareness of PCOS among female undergraduates; that there is no difference in the level of awareness of PCOS among female undergraduates in their second year and final year; and that there is no difference in the level of knowledge of PCOS between female undergraduates in health sciences and those in social sciences.

## Materials and Methods

This study adopted a cross-sectional descriptive design. A self-structured questionnaire derived from a review of the literature was used to collect data. Ethical approval was granted by the Research Ethics Committee (BUHREC 765/24) of the institution. Data collection was done in two weeks, from October 14 to 28, 2024, in female hostels and student lounges during peak convenience hours.

The study population comprised female undergraduate students aged 18 to 25 who consented to participate. Inclusion criteria were students within the specified age range, currently enrolled, residing on campus, and willing to participate. Students were excluded if they lived off-campus or were in their first year (100 level), as the latter had not resumed at the time of data collection. The primary outcome was the level of knowledge and awareness of female undergraduates on PCOS. These were measured using a questionnaire that included items on symptoms, causes, risk factors, and management. The main exposure variable was prior awareness of PCOS, with other predictors including age, academic level, faculty, and previous diagnosis. Potential confounders such as health literacy and reproductive health education were considered,

with age group and course of study treated as effect modifiers.

Demographic data included age, faculty, department, and level of study. Knowledge was assessed using eight items, scored, and categorised into high (9–12), average (6–8), or low (<5) knowledge levels. Awareness was evaluated with 14 dichotomous items coded into binary values, yielding a total score between 14 and 28. Scores of 20 or above indicated high awareness. The measurement followed the nursing and midwifery standards, in which 50% is regarded as a pass and 70% or above is regarded as a high score. Instrument reliability was established using Cronbach's alpha after a pilot test involving 40 eligible participants, yielding a coefficient of 0.81, which reflects good internal consistency of the tool. To minimise bias, participants were sampled from various faculties and academic levels. Questionnaires were self-administered and anonymous, with confidentiality assured. A pilot study was conducted to improve instrument clarity and validity, reducing measurement bias. Furthermore, content validity was ensured and guided by the constructs of the health belief model. Using Slovin's formula, the calculated sample size was 375, drawn from an estimated population of 5,986 female undergraduates and a 5% margin of error. To account for non-response, 413 questionnaires were distributed, and 404 valid responses were analysed.

Quantitative variables included continuous (age) and discrete (knowledge and awareness scores) data, grouped for interpretability. Age was categorised into 18–21 and 22–25 years. Knowledge and awareness were categorised based on their scoring scales, enabling subgroup comparisons.

Descriptive statistics summarised respondents' characteristics and PCOS knowledge/awareness

levels. Pearson's correlation assessed the relationship between knowledge and awareness scores as well as differences in awareness between second-year and final-year students and in knowledge between faculties.

Sampling involved three stages: cluster sampling of seven selected schools, quota sampling within each school by academic level, and random sampling of participants within each quota. While no weighting was applied, this strategy ensured balanced representation.

## Results

A total of 404 questionnaires were properly completed and included in the final analysis, yielding a response rate of 97.8%. Nine questionnaires were excluded due to non-return or incomplete responses.

Participants were all full-time female undergraduates residing on campus, within the age range of 18 to 25 years. Among the 404 respondents analysed, 36 of them reported having a prior diagnosis of PCOS.

### Knowledge of PCOS

The study found that 61.4% had an average level of knowledge of PCOS. A total of 363 respondents (89.9%) recognised PCOS as a hormonal disorder affecting women of reproductive age, and 60.6% were aware of its link to irregular ovulation and potential fertility issues. While a majority correctly identified low sugar diet (76.2%) and regular exercise (73.5%) as effective management strategies, only 46.3% recognised increased androgen levels as a hormonal imbalance associated with PCOS. Additionally, 218 respondents (54%) correctly identified that bone disorder is not a typical long-term complication of untreated PCOS (Refer to Table 1).

**Table 1a: Knowledge of PCOS**

| Knowledge items                                           | List of options                                           | F =404; (%) |
|-----------------------------------------------------------|-----------------------------------------------------------|-------------|
| 1. PCOS is                                                | Type of cancer                                            | 35(8.7%)    |
|                                                           | **a hormonal disorder affecting women of reproductive age | 363(89.9%)  |
|                                                           | A chronic mental health disease                           | 2(0.5%)     |
|                                                           | An autoimmune disease                                     | 4(1%)       |
| 2. Which of the following is not a common symptom of PCOS | Acne                                                      | 33(8.2%)    |
|                                                           | **weight loss                                             | 285(70.5%)  |
|                                                           | Irregular menstrual cycles                                | 33(8.2%)    |
|                                                           | Excess hair growth in a masculine pattern                 | 53(13.1%)   |
| 3. How does PCOS affect fertility                         | It always leads to infertility                            | 121(30%)    |
|                                                           | It does not affect fertility                              | 33(8.2%)    |
|                                                           | It only affects older women                               | 5(1.2%)     |
|                                                           | **It causes irregular ovulation, which may affect         | 245(60.6%)  |

|                                                                                            |                                                      |            |            |
|--------------------------------------------------------------------------------------------|------------------------------------------------------|------------|------------|
| 4. What is a hormonal imbalance associated with PCOS (select all that apply)               | fertility                                            |            |            |
|                                                                                            | Options                                              | No         | Yes        |
|                                                                                            | **Elevated oestrogen levels                          | 171(42.3%) | 233(57.7%) |
|                                                                                            | low insulin levels                                   | 246(60.9%) | 158(38.1%) |
| 5 Which lifestyle factor is often recommended for managing PCOS? Select all that apply.    | **increased androgen levels                          | 217(53.7%) | 187(46.3%) |
|                                                                                            | **low progesterone                                   | 310(76.7%) | 94(23.3%)  |
|                                                                                            | Reduced physical activity                            | 348(86.1%) | 56(13.9%)  |
|                                                                                            | **Low sugar diet                                     | 96(23.8%)  | 308(76.2%) |
| 6. Who is at risk of having PCOS                                                           | **Regular exercise                                   | 107(26.5%) | 297(73.5%) |
|                                                                                            | Decreased water intake                               | 389(96.3%) | 15(3.7%)   |
|                                                                                            | **PCOS can affect any woman of reproductive age      | 282(69.8%) |            |
|                                                                                            | PCOS happens to women, but can also be seen in men   | 7(1.7%)    |            |
| 7. Which of these is not a potential long-term complication associated with untreated PCOS | Only women with a family history of PCOS are at risk | 99(24.5%)  |            |
|                                                                                            | Only women in their 20's                             | 16(4.0%)   |            |
|                                                                                            | Heart disease                                        | 81(20%)    |            |
|                                                                                            | **Bone disorder                                      | 218(54%)   |            |
| 8. These features are usually seen in PCOS diagnosis, except                               | Increased risk of endometriosis                      | 77(19.1%)  |            |
|                                                                                            | Greater likelihood of developing type 2 diabetes     | 28(6.9%)   |            |
|                                                                                            | Irregular or absent menstrual periods                | 30(7.4%)   |            |
|                                                                                            | **low levels of oestrogen                            | 272(67.3%) |            |
| Total                                                                                      | High levels of androgens (male hormones)             | 88(21.8%)  |            |
|                                                                                            | Polycystic ovaries seen on ultrasound                | 14(3.5%)   |            |
|                                                                                            |                                                      | 404(100%)  |            |

KEY: \*\*=Accurate answer

**Table 1b: Summary of Level of Knowledge of PCOS**

| Level Of Knowledge | F (%)       |
|--------------------|-------------|
| High knowledge     | 113 (28%)   |
| Average knowledge  | 248 (61.4%) |
| Low knowledge      | 43 (10.6%)  |
| Total              | 404 (100%)  |

[Max=12; min=2;  $\bar{x}$  =7.45  $\pm$ 2.10]**Awareness of PCOS**

The findings revealed a high level of awareness of PCOS, with 63.4% demonstrating high awareness. While 82.7% were familiar with PCOS, 97.5% recognised it as a significant health concern. Common symptoms such as weight gain and acne

were correctly identified (87.6%), and 86.6% acknowledged their impact on fertility. Additionally, 84.9% agreed that diet and lifestyle modifications can help manage symptoms. However, 79.2% reported not knowing where to find support groups for women with PCOS (Refer to Table 2).

**Table 2a: Awareness of PCOS**

| ITEMS                                                                                                                 | Yes<br>F (%) | No<br>F (%) |
|-----------------------------------------------------------------------------------------------------------------------|--------------|-------------|
| I am familiar with the term "polycystic ovarian syndrome (PCOS)."                                                     | 334(82.7%)   | 70(17.3%)   |
| I have been clinically diagnosed with PCOS                                                                            | 36(8.9%)     | 368(91.1%)  |
| PCOS is a significant health concern                                                                                  | 394(97.5%)   | 10(2.5%)    |
| All women diagnosed with PCOS have multiple cysts in their ovaries                                                    | 258(63.9%)   | 146(36.1%)  |
| Men can be diagnosed with PCOS                                                                                        | 34(8.4%)     | 370(91.6%)  |
| I have received information about PCOS from reliable sources (e.g., healthcare professionals, educational materials). | 244(60.4%)   | 160(39.6%)  |
| Weight gain and acne are common symptoms in women with PCOS                                                           | 354(87.6%)   | 50(12.4%)   |
| PCOS can lead to excess hair growth, e.g., on the face, neck, chest, chin, etc.                                       | 326(80.7%)   | 78(19.3%)   |
| PCOS is a chronic/lifelong disease                                                                                    | 251(62.1%)   | 153(37.9%)  |

|                                                                                  |            |            |
|----------------------------------------------------------------------------------|------------|------------|
| PCOS only affects reproductive health and has no other effects of health effects | 215(53.2%) | 189(46.8%) |
| I am aware that PCOS can affect fertility.                                       | 350(86.6%) | 54(13.4%)  |
| PCOS can affect the menstrual cycle.                                             | 363(89.9%) | 41(10.1%)  |
| Diet and lifestyle modifications significantly help to manage PCOS symptoms      | 343(84.9%) | 61(15.1%)  |
| I know where to find support groups or communities for women with PCOS.          | 84(20.8%)  | 320(79.2%) |
| Weighted mean                                                                    | 256.1      | 147.9      |

**Table 2b: Summary of Awareness Level of PCOS**

| Levels of awareness            | F (%)      |
|--------------------------------|------------|
| High Awareness                 | 256(63.4%) |
| Low Awareness                  | 148(36.6%) |
| Total                          | 404(100%)  |
| [Max=27; min=14; x=22.8 ±2.14] |            |

**Relationship between Knowledge and Awareness of PCOS**

The results in the table above indicate a positive and significant relationship between the level of awareness and knowledge of the female undergraduates ( $r = 0.351$ ;  $p < 0.05$ ). This means a higher knowledge of PCOS among the female

undergraduates is associated with higher awareness about the condition. Hence, the null hypothesis was rejected (Refer to Table 3a). Hypothesis 1: There is no significant relationship between knowledge and awareness of polycystic ovarian syndrome (PCOS) among female undergraduates.

**Table 3a: Relationship between Knowledge and Awareness of PCOS**

|           |                         | Knowledge | Remarks                    |
|-----------|-------------------------|-----------|----------------------------|
| Awareness | Pearson correlation     | 0.351**   | Reject the null hypothesis |
|           | Sig. (2-tailed) p-value | 0.000     |                            |
|           | N                       | 404       |                            |

\*. Correlation is significant at the 0.05 level (2-tailed).

**Difference in the level of awareness of PCOS between female undergraduates in their second year and those in their final year**

Findings indicated that there is a significant difference in the level of awareness of the female undergraduates in the 200 level and those in the

500 level (Mean diff. = 0.44,  $p < 0.05$ ) (Refer to Table 3b).

Hypothesis 2: There is no significant difference in the level of awareness of PCOS between female undergraduates in their second year and those in their final year.

**Table 3b: Difference in the level of awareness of PCOS between female undergraduates in their second year and those in their final year**

| Level of study     |           | N   | Mean ±SD   | Differences     |          |                 | Dec.        |
|--------------------|-----------|-----|------------|-----------------|----------|-----------------|-------------|
|                    |           |     |            | Mean difference | C.I L(U) | Std. error mean | [p-value]   |
| Level of Awareness | 200level  | 113 | 23.23±1.95 |                 | 0.17     |                 |             |
|                    | 500 level | 28  | 23.67±1.65 | 0.44            | (0.73)   | 0.13            | [0.000]     |
|                    |           |     |            |                 |          |                 | Significant |

**Difference in the level of knowledge of PCOS between female undergraduates in health sciences and those in social sciences**

The result indicates that there is a significant difference in the level of knowledge of female undergraduates in social sciences and those in

medical & health sciences (Mean diff. = 2.609,  $p < 0.05$ ) (Refer to Table 3c).

Hypothesis 3: There is no difference in the level of knowledge of PCOS between female undergraduates in health sciences and those in social sciences.

**Table 3c: Difference in level of knowledge of PCOS between female undergraduates in health sciences and those in social sciences**

|                    | School of study | N  | Mean $\pm$ SD    | Differences |          |                 | [p-value] | Dec.        |
|--------------------|-----------------|----|------------------|-------------|----------|-----------------|-----------|-------------|
|                    |                 |    |                  | Mean diff.  | C.I L(U) | Std. error mean |           |             |
| Level of Knowledge | Social science  | 58 | 5.724 $\pm$ 2.05 |             | 2.56     |                 |           |             |
|                    | Medical science | 54 | 8.333 $\pm$ 2.15 | 2.609       | (2.66)   | 0.024           | [0.000]   | Significant |

### Discussion

The study indicates that female undergraduates at the private Nigerian university displayed a relatively high level of awareness of PCOS alongside a moderate level of detailed knowledge about the condition. On the one hand, the majority of participants reported familiarity with the term PCOS, recognised common symptoms such as weight gain, acne, excess hair growth, acknowledged its relevance to fertility and menstrual disturbance, and appreciated that diet and lifestyle play a role in management. On the other hand, more detailed aspects such as hormonal imbalances (particularly elevated androgens), the full spectrum of diagnostic criteria, or the long-term metabolic implications were less well understood. In the study, many students incorrectly believed that all women with PCOS present with multiple ovarian cysts, or that PCOS exclusively affects reproductive health.

This pattern of high surface-level awareness but moderate depth of knowledge is consistent with findings in King Abdulaziz University, Saudi Arabia, where respondents were largely aware of PCOS but had moderate knowledge levels (4, 13). Furthermore, another study in the United Arab Emirates found that while a large proportion were familiar with PCOS, only a minority had sufficient in-depth awareness of the condition's details and implications (14). These studies suggest that awareness campaigns through social media and general exposure to PCOS may be reaching young women without a detailed comprehension of the condition, diagnosis, long-term risks and management appears weaker.

Moreover, PCOS is a multifaceted endocrine/metabolic disorder with reproductive, hormonal, dermatologic, metabolic and psychological dimensions. Understanding elevated androgens, ovarian morphology, insulin resistance, and long-term sequelae requires more scientific or medical background, which many undergraduates may lack. As one study noted, although risk factor knowledge was reasonable, knowledge of complications (e.g., metabolic syndrome, hypertension) was significantly lower (15, 16).

Similarly, the curriculum of study in different disciplines may influence the disparity in knowledge and awareness. For example, students in health sciences disciplines may receive more formal education about PCOS and related disorders, which students in non-health disciplines may not. Indeed, studies show better knowledge among medical/paramedical students compared to non-medical students (14, 16). A difference in knowledge between social sciences and health sciences in this current study supports this notion. Also, reliance on informal sources such as mass media or peer discussion often emphasises the more visible symptoms (e.g., weight gain, acne, hair growth) and the label "PCOS", with less emphasis on the underlying biology, diagnostic nuance, or long-term health implications. Consequently, more attention is given to the more visible manifestations of PCOS rather than less visible but important aspects concerns such as insulin resistance, cardiovascular risk, or the fact that not all women present with ovarian cysts, leading to "partial knowledge". Thus, the high awareness but moderate knowledge scenario suggests that while the condition is recognised, the depth of understanding required for informed decision-making, early detection, and appropriate management is suboptimal. This gap has implications in terms of health behaviour. Knowing the name and recognising a symptom is helpful, but deeper knowledge underlies timely health-seeking, lifestyle adjustment and engagement with supportive services.

These findings highlight several critical points. First, the relatively good awareness provides a foundation on which to build. The fact that many young women know about PCOS and recognise major symptoms means that health education initiatives may have fertile ground. Second, the moderate knowledge indicates an urgent need for more structured, targeted education programmes that deepen understanding of PCOS. Educational interventions should integrate PCOS topics into university health promotion programmes, reproductive health curricula and on-campus wellness campaigns, emphasising both immediate symptom recognition and the importance of early

lifestyle and medical interventions. Enhancing access to reliable information, encouraging timely health-seeking behaviour, and linking young women to support groups and services will help reduce delays in diagnosis and mitigate long-term sequelae such as infertility, type 2 diabetes, cardiovascular disease and psychological distress (17, 18). Moreover, given the interdisciplinary nature of PCOS, public health strategies should adopt a multidisciplinary approach, collaborating across departments (e.g., student health services, nutrition/dietetics, mental health, gynaecology) (19) to offer holistic care. Finally, because universities represent a key setting for reaching young women at a formative stage, leveraging campus-based screening or awareness events (including peer-education, digital media, workshops) could help convert awareness into actionable knowledge, thereby contributing to earlier diagnosis, better self-management and ultimately reduced public health burden. Beyond academic exposure, social and cultural attitudes toward reproductive health play a vital role in shaping awareness and knowledge. In many Nigerian settings, menstrual and fertility disorders remain sensitive topics, often discussed in private or avoided altogether. However, the relatively open environment of private universities may encourage freer dialogue and peer learning about PCOS, partially explaining the higher awareness observed

#### *Limitations*

Findings of this study were limited due to the non-inclusion of students residing off-campus, a single-site design, and self-reporting bias.

#### **Conclusion**

The findings of this study underscore the crucial role of knowledge and awareness in shaping the understanding and management of PCOS among female undergraduates. While an average level of knowledge was observed, particularly regarding the hormonal nature and reproductive implications of PCOS, notable gaps remain in recognising its broader metabolic manifestations, such as insulin resistance and hormonal imbalances. These deficiencies highlight the need for more inclusive and interdisciplinary educational approaches that integrate reproductive health into the curricula of both health and non-health disciplines.

The high level of awareness demonstrated by participants suggests that public discourse and digital media exposure are instrumental in increasing recognition of PCOS.

Integrating PCOS education into university health promotion activities and national adolescent

reproductive health policies could strengthen early diagnosis, lifestyle modification, and long-term prevention strategies for women of reproductive age.

#### **List of abbreviations**

PCOS: Polycystic Ovarian Syndrome

#### **Declarations**

##### *Ethics approval and consent to participate*

The Babcock University Health Research Ethics Committee (BUHREC) approved the conduct of the study.

##### *Consent for publication*

All authors consented to the publication of the research findings

##### *Availability of data and materials*

The datasets generated and/or analysed during the current study are available from the corresponding author on reasonable request.

##### *Competing interests*

The authors declare that they have no known competing interests, either financial or personal, that could have appeared to influence the work reported in this paper.

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##### *Author contribution*

AAO: literature search, manuscript writing, analysis  
OOO: supervision, validation, review, analysis, discussion, manuscript editing  
ARA and OEA: manuscript editing

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