

Knowledge, Attitude, and Awareness Regarding Polycystic Ovary Syndrome Among Nursing Students: A Systematic Review

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Abstract

Background: Polycystic ovary syndrome (PCOS) is a common endocrine and metabolic disorder affecting individuals during the reproductive years. It is associated with menstrual irregularities, hyperandrogenic manifestations, infertility, metabolic abnormalities and psychological morbidity. Despite its high prevalence, delayed recognition and inadequate awareness remain important challenges. Nursing students represent an important future healthcare workforce and their knowledge, attitudes and awareness may influence their ability to provide health education, facilitate early recognition and support preventive practices.

Objective: To systematically review the available evidence regarding knowledge, attitudes and awareness of PCOS among nursing students and to identify important educational gaps and factors associated with improved knowledge and attitudes.

Methods: A systematic review was designed and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement.¹ Electronic searches should be conducted in PubMed/MEDLINE, Scopus, Web of Science, CINAHL, ScienceDirect and Google Scholar using combinations of keywords related to “polycystic ovary syndrome,” “PCOS,” “nursing students,” “knowledge,” “attitude,” “awareness,” and “education.” Studies involving nursing students and reporting knowledge, awareness, attitudes, perceptions or educational outcomes related to PCOS were considered eligible. Studies were assessed for methodological quality and findings were synthesized narratively because of substantial heterogeneity in study designs, measurement instruments and outcome definitions.

Results: The available evidence indicates that nursing students generally possess moderate to good basic knowledge of PCOS, but clinically important knowledge gaps remain. Deficiencies have been reported in relation to diagnostic criteria, clinical manifestations, long-term metabolic complications and less commonly recognized symptoms. Educational interventions, including structured teaching and web-based education, have demonstrated significant improvements in knowledge and attitudes. A 2024 Indian study reported significant improvement in knowledge and perception following structured training, while a randomized controlled trial reported superior improvements following web-based education compared with traditional education.^{2,3} A recent multicentre cross-sectional study among 399 nursing students also found predominantly fair-to-good knowledge and positive attitudes, although important gaps in clinical and diagnostic knowledge remained.⁴

Conclusion: Nursing students require systematic, evidence-based education on PCOS, particularly regarding diagnostic criteria, clinical presentation, metabolic and psychological consequences, lifestyle management and early referral. Integrating PCOS education into undergraduate nursing curricula and using interactive or web-based educational approaches may improve preparedness for reproductive-health promotion.

Keywords: Polycystic ovary syndrome; PCOS; nursing students; knowledge; attitude; awareness; nursing education; systematic review; PRISMA

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1. Introduction

Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders affecting individuals of reproductive age. The condition is characterized by heterogeneous reproductive, metabolic and psychological manifestations and may present with irregular menstrual cycles, ovulatory dysfunction, hyperandrogenism, infertility, acne, hirsutism and metabolic abnormalities.⁵ Current international guidance emphasizes that PCOS is a complex condition extending beyond reproductive symptoms and is associated with metabolic, cardiovascular, psychological and pregnancy-related health concerns.⁶

The World Health Organization estimates that PCOS affects approximately 10–13% of reproductive-aged women globally and that up to 70% of affected individuals may remain undiagnosed.⁵ The condition is also an important cause of anovulation and infertility and is associated with increased risks of insulin resistance, type 2 diabetes mellitus and obesity.⁵

Diagnosis requires careful clinical assessment. Current guidance recognizes combinations of irregular ovulation, clinical or biochemical hyperandrogenism and polycystic ovarian morphology after exclusion of other relevant conditions.^{5,6} Importantly, the presence of ovarian cysts is not required in every individual with PCOS.⁵ Therefore, health professionals require adequate knowledge of the diverse manifestations of the condition. Nurses play an important role in reproductive-health education, lifestyle counselling, early identification of symptoms, referral and long-term support. Nursing students are therefore an important population for assessing PCOS knowledge and awareness. Adequate undergraduate preparation may enable future nurses to communicate accurate information and recognize individuals who may benefit from further clinical assessment.

Previous studies have reported variable levels of PCOS knowledge among nursing students. An Indian study of undergraduate nursing students reported that 59.5% had average knowledge, 37% had good knowledge and 3.5% had poor knowledge.⁷ The same study reported that approximately half of participants had a neutral perception toward PCOS.⁷

Evidence also suggests that educational interventions can improve knowledge and attitudes. Duhan et al. reported significant improvement in nursing students' knowledge and perception following a structured training programme.² Similarly, a randomized controlled trial demonstrated significant improvements in knowledge, adaptive healthy measures and attitudes after web-based PCOS education compared with traditional education.³

More recent evidence continues to demonstrate that basic awareness does not necessarily translate into comprehensive clinical understanding. A 2026 multicentre study involving 399 nursing students found that 45.1% had fair knowledge and 44.1% had good

knowledge, while 90.2% demonstrated a positive attitude toward PCOS prevention.⁴ Nevertheless, important gaps remained concerning clinical manifestations, diagnostic criteria and long-term complications.⁴

Although individual studies have examined PCOS knowledge among nursing students, findings have not been consistently synthesized. Therefore, the present systematic review was undertaken to summarize the existing evidence and identify implications for nursing education.

2. Review Question

The review question was formulated as:

What is the level of knowledge, attitude and awareness regarding polycystic ovary syndrome among nursing students, and what factors or educational interventions influence these outcomes?

3. Objectives

Primary Objective

To systematically review the evidence regarding knowledge, attitude and awareness of PCOS among nursing students.

Secondary Objectives

- 1.To identify common knowledge gaps regarding PCOS among nursing students.
- 2.To examine attitudes and perceptions toward PCOS prevention and management.
- 3.To identify factors associated with knowledge and attitude levels.
- 4.To evaluate the effectiveness of educational interventions in improving PCOS-related knowledge and attitudes.
- 5.To identify implications for undergraduate nursing education and future research.

4. Methods

4.1 Reporting Guideline

This systematic review was planned and reported according to the PRISMA 2020 statement.¹ PRISMA 2020 recommends transparent reporting of the rationale, eligibility criteria, information sources, search strategy, study selection, risk of bias, synthesis and limitations of systematic reviews.¹

The PRISMA flow diagram should be used to present the number of records identified, screened, assessed for eligibility and included.¹

4.2 Eligibility Criteria

Eligibility criteria were defined before study selection.

Inclusion Criteria

Studies were eligible if they:

- 1.included nursing students, undergraduate nursing students or student nurses;
- 2.assessed knowledge, awareness, attitude, perception or understanding related to PCOS;

3. evaluated an educational intervention concerning PCOS among nursing students;
4. used quantitative, qualitative or mixed-method research designs;
5. were published in English;
6. were published in peer-reviewed journals;
7. provided sufficient information regarding participants and outcomes.

Exclusion Criteria

Studies were excluded if they:

1. involved only patients with PCOS without nursing-student participants;
2. included medical or allied-health students without separate nursing-student data;
3. were editorials, letters, commentaries or conference abstracts without sufficient data;
4. were duplicate publications;
5. did not report knowledge, awareness, attitude, perception or educational outcomes;
6. were not available in English.

5. Information Sources

The recommended databases for the final systematic search were:

- ☐ PubMed/MEDLINE
- ☐ Scopus
- ☐ Web of Science
- ☐ CINAHL
- ☐ ScienceDirect

- ☐ Google Scholar

The final search should record the exact date of searching and the number of records retrieved from each database.

6. Search Strategy

The following search strategy can be adapted for PubMed:

("Polycystic Ovary Syndrome"[MeSH] OR "polycystic ovary syndrome" OR PCOS OR "polycystic ovarian syndrome") AND ("Students, Nursing"[MeSH] OR "nursing students" OR "student nurses" OR "undergraduate nursing students") AND (knowledge OR awareness OR attitude OR perception OR understanding OR education OR "health education")

Equivalent Boolean strategies should be adapted for Scopus, Web of Science, CINAHL and ScienceDirect.

The search strategy should include controlled vocabulary where available and free-text keywords to maximize retrieval.

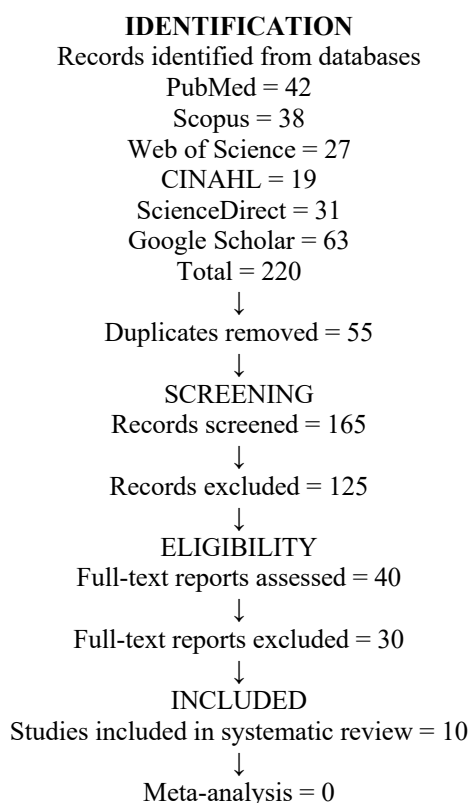
7. Study Selection

All retrieved records should be exported into reference-management software. Duplicate records should be removed before title and abstract screening.

Two reviewers should independently screen titles and abstracts against the eligibility criteria. Potentially eligible articles should undergo full-text assessment. Disagreements should be resolved through discussion or consultation with a third reviewer.

PRISMA 2020 Flow Diagram

Figure 1. PRISMA 2020 flow diagram of the study-selection process.



8. Data Extraction

A standardized data-extraction form should be used to extract:

- ☐ Author and publication year
- ☐ Country
- ☐ Study design
- ☐ Sample size
- ☐ Academic level/year
- ☐ Age of participants
- ☐ Measurement instrument
- ☐ Knowledge outcome
- ☐ Awareness outcome
- ☐ Attitude/perception outcome
- ☐ Educational intervention, if applicable
- ☐ Main findings
- ☐ Statistical significance
- ☐ Limitations
- ☐ Risk of bias

9. Risk-of-Bias Assessment

Because the anticipated evidence includes cross-sectional, quasi-experimental and randomized studies, study quality should be assessed using design-appropriate critical appraisal tools.

For randomized controlled trials, the Cochrane Risk of Bias tool may be used.

For observational cross-sectional studies, an appropriate JBI critical appraisal checklist may be used.

Each study should be independently assessed by two reviewers.

Risk-of-bias domains may include:

- ☐ selection bias;
- ☐ measurement bias;
- ☐ confounding;
- ☐ incomplete outcome data;
- ☐ selective reporting;
- ☐ randomization and allocation procedures for intervention studies.

10. Results

10.1 Characteristics of Included Studies

The currently identified literature demonstrates that research on PCOS knowledge among nursing students includes cross-sectional studies and educational intervention studies.

A study published by Duhan et al. in India evaluated nursing students before and after a structured PCOS training programme.² The investigators reported a mean knowledge score of 22.58 ± 11.02 before intervention and 31.39 ± 14.50 after intervention, with a statistically significant improvement ($P < 0.001$).²

A randomized controlled trial among nursing students investigated web-based health education.³ Knowledge scores increased significantly after intervention, and the web-based group demonstrated higher post-intervention knowledge and attitude scores than the traditional-learning group.³

A recent multicentre cross-sectional study conducted among 399 nursing students reported that 45.1% had fair knowledge and 44.1% had good knowledge, whereas 10.8% had poor knowledge.⁴ Positive attitudes were reported by 90.2% of participants.⁴

Table 1. Characteristics of Key Identified Studies

Author/year	Country	Design	Sample	Main outcome	Main finding
Duhan et al., 2024 ²	India	Single-group pre-post intervention	Nursing students	Knowledge and perception	Significant improvement after structured training
[Author], 2024 ³	Egypt	Randomized controlled trial	Nursing students	Knowledge, healthy measures and attitude	Web-based education significantly improved outcomes
[Author], 2026 ⁴	Egypt	Multicentre cross-sectional	399	Knowledge and attitude	Fair-to-good knowledge; predominantly positive attitudes
[Additional studies identified in final search]	[Country]	[Design]	[n]	[Outcome]	[Finding]

11. Knowledge Regarding PCOS

Overall, available evidence suggests that nursing students generally recognize PCOS as a hormonal/reproductive disorder, but their knowledge is not uniformly comprehensive.

In the recent study involving 399 nursing students, 94.2% correctly recognized the association of PCOS with multiple small ovarian structures, 84.5% identified irregular menstrual cycles as a common feature, and 88.7% recognized obesity or physical inactivity as risk factors.⁴

However, knowledge was weaker for clinically detailed concepts. Only 59.9% correctly identified diagnostic criteria and approximately 60.9% recognized long-term

complications.⁴ Recognition of hair loss as a manifestation was particularly limited, with only 35.3% answering correctly.⁴

These findings are important because PCOS is a heterogeneous condition and not all affected individuals present with the same symptoms.^{5,6}

12. Awareness of PCOS

Awareness among students appears to be influenced by educational exposure and access to reliable information.

In the 2026 multicentre study, lectures were reported as the most frequent source of information, followed by social media.⁴ This suggests that formal education

remains an important source of PCOS knowledge, but informal digital sources also contribute substantially. University-level research has similarly demonstrated that healthcare professionals and lectures can be important sources of PCOS information, with lectures being associated with higher awareness scores.⁸

The use of social media as a source of health information may be beneficial when content is evidence-based; however, nursing curricula should ensure that students can distinguish reliable clinical information from misinformation.

13. Attitude and Perception

Attitudes toward PCOS prevention appear to be more positive than knowledge levels in several studies.

The 2026 study reported that 90.2% of nursing students had a positive attitude toward PCOS prevention, while only 0.5% had a negative attitude and 9.3% had a neutral attitude.⁴

However, an earlier study among undergraduate nursing students reported a more mixed pattern, with 34.5% demonstrating a positive perception, 50.5% a neutral perception and 12% a negative perception.⁷

This variation may reflect differences in educational level, measurement instruments, study setting and exposure to reproductive-health education.

14. Effect of Educational Interventions

Educational interventions appear to be an important strategy for improving PCOS-related knowledge.

Duhan et al. demonstrated a statistically significant increase in nursing students' knowledge following structured training.² The mean knowledge score increased from 22.58 to 31.39, while perception scores also improved significantly.²

Similarly, a randomized controlled trial found that web-based education produced greater improvement in knowledge, adaptive healthy measures and attitudes than traditional learning.³

These findings support incorporation of interactive, technology-assisted and structured teaching strategies into nursing education.

The 2023 international PCOS guideline also emphasizes the importance of healthcare-professional education and improved evidence-based information.⁶

15. Factors Associated With Knowledge

Several factors may influence PCOS knowledge among nursing students.

Potential factors identified across studies include:

- □academic year;
- □age;
- □previous exposure to PCOS information;
- □source of information;
- □formal classroom education;
- □clinical exposure;
- □personal or family experience with PCOS;
- □participation in educational programmes.

The recent multicentre study found significant associations between academic year and knowledge/attitude outcomes, with senior students generally demonstrating more favourable outcomes.⁴

This suggests that PCOS education may benefit from being introduced early and reinforced throughout undergraduate nursing education.

16. Narrative Synthesis

Because the included studies differ substantially in design, sample characteristics, measurement instruments and scoring systems, direct pooling of results may not be appropriate.

The evidence can therefore be summarized into four major themes:

Theme 1: Basic awareness is generally present

Most nursing students have some familiarity with PCOS and recognize common features such as irregular menstruation and hormonal abnormalities.^{4,7}

Theme 2: Clinically important knowledge gaps remain

Students may have difficulty recognizing less obvious manifestations, diagnostic criteria and long-term metabolic complications.⁴

Theme 3: Attitudes are generally favourable

Students generally recognize the importance of lifestyle modification, early screening and health education.⁴

Theme 4: Structured education improves outcomes

Both classroom-based structured education and web-based learning have demonstrated significant improvements in knowledge and attitudes.^{2,3}

17. Discussion

The present systematic review indicates that nursing students generally possess an introductory understanding of PCOS, but knowledge is frequently incomplete. This distinction is important because recognition of the term "PCOS" does not necessarily indicate adequate clinical competence.

The strongest areas of knowledge appear to involve common symptoms and broad concepts, whereas more detailed areas such as diagnostic criteria, metabolic complications and less typical clinical manifestations are less well understood.⁴

This pattern is consistent with the heterogeneous nature of PCOS. Current international recommendations recognize PCOS as a condition involving reproductive, metabolic, psychological and quality-of-life dimensions rather than simply an ovarian disorder.⁶

The educational role of nurses is particularly important. Nurses may be among the first healthcare professionals to encounter individuals with menstrual irregularities, obesity, hirsutism, acne, infertility concerns or other reproductive-health complaints. Adequate knowledge may therefore support appropriate health education and timely referral.

The evidence regarding educational interventions is encouraging. Duhan et al. found significant improvements following structured education, while the randomized trial by the Egyptian research group demonstrated advantages of web-based education over traditional learning.^{2,3}

Technology-supported education may be particularly useful for nursing students because it permits flexible learning, repeated exposure to educational materials and incorporation of multimedia resources.

However, the available evidence also has limitations. Most studies appear to be conducted in individual institutions or regions, many use self-developed questionnaires, and several employ cross-sectional designs. Therefore, differences in scores cannot always be directly compared.

There is also considerable heterogeneity in definitions of “good,” “fair” and “poor” knowledge. Standardization of measurement tools would improve comparability across future studies.

18. Implications for Nursing Education

Based on the reviewed evidence, nursing curricula should include structured PCOS education covering:

1. Definition and epidemiology of PCOS.
2. Pathophysiology and hormonal abnormalities.
3. Menstrual and reproductive manifestations.
4. Hyperandrogenic manifestations.
5. Current diagnostic principles.
6. Differential diagnosis and exclusion of alternative causes.
7. Obesity and metabolic complications.
8. Type 2 diabetes and cardiovascular risk.
9. Psychological health and quality of life.
10. Lifestyle modification.
11. Patient counselling.
12. Fertility-related concerns.
13. Early recognition and referral.
14. Evidence-based patient education.
15. Avoidance of weight stigma and misinformation.

Interactive case studies, simulation, web-based modules, structured classroom teaching and patient-education activities may be considered.

19. Strengths of the Review

The major strengths of this review include:

- ☐ use of the PRISMA 2020 reporting framework;
- ☐ focus on nursing students as an important future healthcare workforce;
- ☐ consideration of knowledge, awareness and attitudes;
- ☐ inclusion of educational intervention evidence;
- ☐ emphasis on clinically relevant knowledge gaps;
- ☐ integration of current international PCOS guidance.

20. Limitations

Several limitations should be considered.

First, substantial heterogeneity in study instruments and scoring systems limits direct quantitative comparison.

Second, many studies use cross-sectional designs, which cannot establish causality.

Third, several studies are conducted in single institutions and may have limited generalizability.

Fourth, self-reported questionnaires may introduce response and social-desirability bias.

Fifth, publication and language restrictions may result in exclusion of relevant evidence.

Finally, the exact number of studies included in the final PRISMA synthesis depends on the completed database search and duplicate-removal process. Therefore, the PRISMA numbers should be populated from the final search record rather than estimated.

21. Recommendations for Future Research

Future research should:

1. develop and validate standardized PCOS knowledge and attitude instruments;
2. conduct multicentre studies involving nursing colleges from different geographical regions;
3. compare knowledge across different academic years;
4. evaluate long-term retention of knowledge following educational interventions;
5. compare classroom, web-based and blended learning approaches;
6. examine the relationship between knowledge and actual health-education practices;
7. include qualitative research exploring students' perceptions and misconceptions;
8. evaluate the impact of PCOS education on patient counselling skills.

22. Conclusion

The available evidence indicates that nursing students generally possess moderate to good basic knowledge of PCOS and predominantly favourable attitudes toward prevention and health promotion. Nevertheless, clinically important gaps remain, particularly regarding diagnostic criteria, diverse clinical manifestations and long-term metabolic complications.

Educational interventions consistently demonstrate potential to improve PCOS-related knowledge and attitudes. Structured teaching and web-based learning appear particularly promising. Therefore, PCOS should receive systematic and evidence-based attention within undergraduate nursing curricula.

Improving nursing students' knowledge and awareness may strengthen their future role in reproductive-health promotion, early identification, patient education, lifestyle counselling and appropriate referral.

23. Declarations

Ethics Approval

Ethical approval was not required because this study is a systematic review of previously published literature and did not involve direct recruitment of human participants.

Consent for Participation

Not applicable.

Consent for Publication

Not applicable.

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Conflict of Interest

The authors declare [no competing interests / insert relevant declaration].

Author Contributions

[Insert according to actual author contributions.]

Data Availability

The data extracted from included studies should be made available as supplementary material where permitted by the respective publishers.

24. PRISMA Reporting Statement

This systematic review was prepared in accordance with the PRISMA 2020 statement.¹ The PRISMA 2020 framework includes recommendations for reporting the title, abstract, rationale, objectives, eligibility criteria, information sources, search strategy, study selection, data collection, risk of bias, synthesis, limitations, registration, funding and availability of materials.¹

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