



Research Article

Copyright© Emmanuel M Akwuruoha

Evaluation of Causes, Diagnosis and Management of Polycystic Ovarian Syndrome by Healthcare Providers in Nigeria: A Mixed-Method

Emmanuel M Akwuruoha^{1*} and Augustine I Airaodion²

¹Department of Obstetrics and Gynaecology, Abia State University Teaching Hospital, Aba, Nigeria

²Department of Biochemistry, Lead City University, Ibadan, Oyo State, Nigeria

***Corresponding author:** Emmanuel M Akwuruoha, Department of Obstetrics and Gynaecology, Abia State University Teaching Hospital, Aba, Nigeria.

To Cite This Article: Emmanuel M Akwuruoha*, Evaluation of Causes, Diagnosis and Management of Polycystic Ovarian Syndrome by Healthcare Providers in Nigeria: A Mixed-Method. Am J Biomed Sci & Res. 2025 28(6) AJBSR.MS.ID.003748, DOI: [10.34297/AJBSR.2025.28.003748](https://doi.org/10.34297/AJBSR.2025.28.003748)

Received: 📅 October 23, 2025; **Published:** 📅 November 03, 2025

Abstract

Background: Polycystic Ovarian Syndrome (PCOS) is one of the most common endocrine and reproductive disorders among women of reproductive age. In Nigeria, limited awareness, lack of standardized diagnostic practices, and fragmented management strategies present significant challenges. Evaluating healthcare providers' knowledge, diagnostic practices, and management approaches is essential for strengthening clinical capacity and improving patient outcomes.

Objective: This study aimed to evaluate the causes, diagnostic practices, and management strategies of PCOS among healthcare providers in Nigeria using a mixed-method approach.

Materials and Methods: A mixed-method design was adopted, combining a quantitative cross-sectional survey and qualitative interviews. The study was conducted at Abia State University Teaching Hospital, Aba, Nigeria, with 275 healthcare providers recruited through multistage sampling. Quantitative data were collected using structured questionnaires and analyzed with SPSS version 26.0 for descriptive and inferential statistics, while qualitative data from in-depth interviews (n=20) and focus group discussions (n=21) were thematically analyzed using NVivo 12.

Results: The majority of respondents were nurses/midwives (36.0%) and resident doctors (20.7%), with 56.0% being female. Awareness of the Rotterdam criteria was highest (74.2%), while only 31.3% were aware of the Androgen Excess Society criteria. Routine use of pelvic ultrasound (60.7%) and lifestyle counselling (80.4%) were common, but advanced biochemical testing (44.7%) and multidisciplinary clinics (25.8%) were underutilized. Key challenges included limited access to diagnostic tests (65.1%), patients' delayed presentation (55.3%), and inadequate institutional protocols (35.3%). Knowledge scores were significantly associated with cadre, years of practice, and number of PCOS patients seen per month ($p < 0.05$). Logistic regression showed that being a consultant (OR=2.84, 95% CI: 1.43-5.64), having >10 years of practice (OR=1.78, 95% CI: 1.06-2.98), and managing ≥ 5 PCOS patients monthly (OR=2.11, 95% CI: 1.22-3.64) predicted higher knowledge. Qualitative findings revealed themes of diagnostic challenges, management gaps, inadequate training, and patient-related barriers.

Conclusion: Healthcare providers in Nigeria demonstrate moderate awareness of PCOS, but significant gaps remain in advanced diagnostic testing, guideline use, and multidisciplinary care. Continuous professional training, improved access to diagnostic facilities, and development of standardized local guidelines are needed to enhance PCOS care.

Keywords: Polycystic ovarian syndrome, Healthcare providers, Diagnosis, Management, Knowledge

Introduction

Polycystic Ovary Syndrome (PCOS) is a common, heterogeneous endocrine disorder of reproductive-aged people that manifests with a spectrum of reproductive, metabolic, and psychological features, and poses a substantial burden to individual health and to health systems worldwide. PCOS commonly presents with menstrual irregularity, hyperandrogenism (clinical or biochemical), and polycystic ovarian morphology, but presentation varies widely across individuals and populations; because of its heterogeneity, the condition is best conceptualized as a syndrome rather than a single disease entity. This heterogeneity complicates case detection, clinical classification, and epidemiologic estimates, and contributes to variable reported prevalence across studies and settings [1]. Although the precise aetiology of PCOS is not fully resolved, a substantial body of evidence indicates a multifactorial origin in which genetic predisposition interacts with environmental and metabolic exposures. Insulin resistance, hyperinsulinaemia, and adiposity are central pathogenic drivers of the common phenotypes, which foster ovarian androgen excess and anovulation. Meanwhile, inflammatory pathways, in utero programming, and lifestyle factors (including diet, physical inactivity, and weight gain) modify the phenotypic expression. Because causation is complex and partially overlapping, management ideally targets both reproductive features and cardiometabolic risk across the life course [1].

Diagnosis remains a clinical challenge internationally because several sets of diagnostic criteria exist (for example, the Rotterdam and NIH criteria), and features such as polycystic ovarian morphology on ultrasound are age- and technology-dependent, and may be absent in some phenotypes. International evidence-based guidelines emphasize a careful clinical assessment (menstrual history, signs of hyperandrogenism, metabolic screening) and recommend individualized use of biochemical tests and imaging, while warning against over-reliance on ultrasound findings alone. These guideline recommendations also highlight gaps in the evidence base and call for improved clinician education and systems that support holistic, long-term care (reproductive, metabolic and psychosocial) [2]. In Nigeria, available hospital-based and regional data suggest that PCOS is an important contributor to infertility and menstrual disorders seen in gynecologic and endocrine services, but prevalence and clinical profiles differ between settings and are influenced by the diagnostic criteria and the populations recruited (community versus tertiary-care or infertility clinics). Several Nigerian studies and hospital audits report substantial representation of PCOS among women presenting with infertility and menstrual complaints; however, underdiagnosis and delayed diagnosis have been reported, reflecting limitations in awareness, variable use of diagnostic protocols, and resource constraints for laboratory and imaging investigations in some clinical contexts. These local realities underscore the importance of examining how healthcare providers in Nigeria understand, diagnose, and manage PCOS [3].

Management of PCOS requires a multi-component approach that includes lifestyle modification (weight management, diet and physical activity), targeted pharmacotherapy for menstrual regulation, fertility treatment when indicated, and screening/treatment for metabolic comorbidities; international guidance also stresses person-centred care and attention to mental-health needs [4]. Nevertheless, real-world delivery of these interventions depends on provider knowledge, attitudes, available diagnostics and treatments, referral pathways, and system-level supports. Recent studies from diverse settings reveal important gaps in healthcare providers' knowledge and practice regarding PCOS, particularly in primary care and non-specialist settings, suggesting a need for improved training, standardized diagnostic pathways, and context-appropriate management algorithms. For Nigeria, where care is delivered across a mix of tertiary centres, general hospitals, and primary care clinics, understanding provider behaviour and system constraints is essential to designing interventions that improve timely diagnosis and comprehensive management [5,6]. Given PCOS's clinical heterogeneity, psychosocial consequences, and long-term cardiometabolic risks, generating locally relevant evidence on causes (as perceived and encountered clinically), diagnostic strategies in routine practice, and management approaches used by Nigerian healthcare providers will inform practical improvements in training, guidelines implementation, and service delivery. A mixed-method design that combines quantitative assessment of provider knowledge and practices with qualitative exploration of provider perspectives, diagnostic reasoning and system barriers is especially well-suited to illuminate both the measurable scope of practice gaps and the contextual drivers of those gaps. The findings will be valuable for policymakers, professional bodies, and educators seeking to adapt international guidance to the Nigerian health system and to promote person-centred, evidence-based PCOS care across levels of service.

Materials and Methods

Study Design

This study adopted a mixed-method design, combining both quantitative and qualitative approaches to provide a comprehensive evaluation of healthcare providers' knowledge, diagnostic practices, and management strategies for Polycystic Ovarian Syndrome (PCOS). The quantitative arm employed a cross-sectional survey using structured questionnaires, while the qualitative arm utilized In-Depth Interviews (IDIs) and Focus Group Discussions (FGDs) to explore perceptions, challenges, and experiences related to PCOS management.

Study Area

The research was conducted at Abia State University Teaching Hospital (ABSUTH), Aba, Abia State, Nigeria, a tertiary healthcare facility that serves as a referral centre for the southeastern region of Nigeria. The hospital is equipped with specialized departments,

including Obstetrics and Gynaecology, Internal Medicine, Family Medicine, and Endocrinology, which provide diagnostic and treatment services for reproductive and metabolic disorders, including PCOS.

Study Population

The target population comprised Healthcare Providers (HCPs) involved in the diagnosis, counselling, and management of women with reproductive and endocrine disorders. This included: Consultant physicians (Obstetricians/Gynaecologists, Endocrinologists, Family Physicians), Resident doctors in relevant specialties, Nurses and midwives working in the gynaecology and reproductive health units and Laboratory scientists involved in hormonal and metabolic testing

Inclusion Criteria

Healthcare providers working in ABSUTH with at least six months of clinical experience in relevant departments.

Willingness to participate and provide informed consent.

Exclusion Criteria

Providers on leave or not actively engaged in clinical duties at the time of the study.

Interns or trainees without independent patient management responsibilities.

Sample Size Determination

The sample size was determined using Cochran's formula for estimating population proportions, as outlined by *Akwuruoha, et al.*, [7]:

$$n = \frac{Z^2(Pq)}{e^2}$$

The formula components are defined as follows:

- 1) n represents the minimum required sample size.
- 2) Z is set at 1.96, corresponding to a 95% confidence level.
- 3) P denotes the proportion of healthcare providers knowledgeable about PCOS
- 4) e signifies the allowable margin of error, fixed at 5% (0.05).

$$q = 1 - p$$

A recent study conducted by *Erku, et al.*, [5] reported the proportion of healthcare providers knowledgeable about PCOS as 20.5%

$$P = 20.5\% = 0.205$$

$$q = 1 - 0.205$$

$$= 0.795$$

$$n = \frac{(1.96)^2 (0.205 \times 0.795)}{(0.05)^2}$$

$$n = \frac{3.8416 \times (0.16298)}{0.0025}$$

$$n = \frac{0.6261}{0.0025} = 250.43$$

The minimum sample size was 250, but it was adjusted to 275 to account for a 10% non-response rate.

Sampling Technique

A multistage sampling technique was employed:

- 1) Departments relevant to PCOS care were purposively selected.
- 2) Within departments, eligible healthcare providers were identified.
- 3) Participants were then recruited using systematic random sampling for the quantitative arm.
- 4) For qualitative interviews, purposive sampling ensured inclusion of providers with varied roles and years of experience.

Data Collection Instruments

Quantitative Survey

A structured, self-administered questionnaire was developed based on a review of relevant literature, WHO guidelines on reproductive health, and diagnostic criteria for PCOS (Rotterdam criteria, NIH, and Androgen Excess Society). The instrument was divided into five sections:

- 1) Socio-demographic characteristics (age, gender, cadre, years of practice).
- 2) Knowledge of causes and risk factors of PCOS.
- 3) Awareness and use of diagnostic criteria (clinical, biochemical, imaging).
- 4) Management practices (pharmacological, lifestyle modification, counselling, referral patterns).
- 5) Challenges in diagnosis and management.

Qualitative Instruments

- 1) In-Depth Interview (IDI) Guide: Semi-structured questions explored providers' experiences with PCOS diagnosis and management, perceived barriers, and recommendations.
- 2) Focus Group Discussion (FGD) Guide: Explored group perspectives on challenges and institutional practices in PCOS care. Discussions were audio-recorded with consent.

Validity and Reliability

The questionnaire was subjected to content and face validation by experts in reproductive endocrinology and public health. A pilot study was conducted with 30 healthcare providers from the General Hospital, Aba, to refine clarity and consistency. Cronbach's alpha reliability coefficient was computed to assess internal consistency, with a value of 0.82, indicating good reliability.

Data Collection Procedure

Trained research assistants administered questionnaires during departmental meetings and duty hours. Completed forms were collected immediately to minimize non-response. IDIs and FGDs were conducted in quiet, private hospital offices. Each session lasted 30-60 minutes and was conducted in English. Field notes and audio recordings were transcribed verbatim.

Data Analysis

Quantitative Data

Data were coded and entered into IBM SPSS version 26.0 for analysis. Descriptive statistics (frequencies, percentages, means, and standard deviations) summarized demographic characteristics, knowledge, and practices. Inferential statistics (Chi-square test, independent t-test, and logistic regression) were used to determine associations between socio-demographic characteristics and knowledge/practice levels. Statistical significance was set at $p < 0.05$.

0.05.

Qualitative Data

Transcribed data were imported into NVivo 12 for thematic analysis. Thematic coding followed Braun and Clarke's six-step framework: familiarization, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and writing up. Triangulation of quantitative and qualitative findings enhanced validity.

Ethical Considerations

Permission to conduct the study was granted by departmental heads. Informed consent was obtained from each participant, confidentiality was maintained, and identifiers were excluded from data analysis. Participation was voluntary, with the right to withdraw at any stage without consequences.

Results

The socio-demographic distribution of respondents (Table 1) showed that the majority were between 25-34 years (33.5%), with more females (56.0%) than males (44.0%). Nurses/midwives formed the largest cadre (36.0%), followed by resident doctors (20.7%), while consultants made up 9.5%. Most participants had 6-10 years (32.0%) or more than 15 years (25.1%) of clinical practice.

Table 1: Socio-demographic Characteristics of Participants.

Variable	Frequency	Percentage (%)
Age (years)		
15-24	49	17.82
25-34	92	33.45
35-44	71	25.82
45 and above	63	22.91
Gender		
Male	121	44
Female	154	56
Cadre		
Consultant (Ob/Gyn, Endo, Family Med)	26	9.45
Resident doctors	57	20.73
Nurse / Midwife	99	36
Laboratory scientist	28	10.18
Other (pharmacist, health officer, admin)	65	23.64
Years of clinical practice		
< 1 year	12	4.36
1-5 years	57	20.73

6-10 years	88	32
11-15 years	49	17.82
> 15 years	69	25.09

Awareness of diagnostic criteria and tests (Table 2) indicated that three-quarters (74.2%) were aware of the Rotterdam criteria, about half (50.6%) knew of the NIH criteria, while only 31.3% were aware of the Androgen Excess Society criteria. Pelvic ultrasound

was routinely used by 60.7% of respondents, while biochemical androgen profiling was ordered by less than half (44.7%). Screening with fasting glucose/OGTT was reported by 51.3%, whereas only 33.5% referred complex cases to endocrinologists.

Table 2: Awareness of Diagnostic Criteria and Commonly Used Diagnostic Tests.

Variable	Response	Frequency (n = 275)	Percentage (%)
Awareness of Rotterdam criteria (have heard/used)	Yes	204	74.18
	No	71	25.82
Awareness of NIH criteria	Yes	139	50.55
	No	136	49.45
Awareness of Androgen Excess Society criteria	Yes	86	31.27
	No	189	68.73
Routine use of pelvic ultrasound for suspected PCOS	Yes	167	60.73
	No	108	39.27
Routine ordering of biochemical androgen profile (testosterone/SHBG)	Yes	123	44.73
	No	152	55.27
Use of fasting glucose / OGTT for metabolic screening	Yes	141	51.27
	No	134	48.73
Referral of complex PCOS to Endocrinology	Yes	92	33.45
	No	183	66.55

Regarding management practices (Table 3), lifestyle counselling was widely adopted (80.4%), and two-thirds (66.9%) used combined oral contraceptives for menstrual regulation. About half

(50.6%) were prescribed metformin, while use of anti-androgens (17.5%), fertility referrals (19.3%), and multidisciplinary clinics (25.8%) remained low.

Table 3: Management approaches used for PCOS.0.

Management Approach	Response	Frequency (n=275)*	Percentage (%)
Lifestyle counselling (diet/exercise) routinely	Yes	221	80.36
	No	54	19.64
Metformin is prescribed for metabolic/ovulatory issues	Yes	139	50.55
	No	136	49.45
Combined oral contraceptives (COCs) are used for menstrual regulation	Yes	184	66.91
	No	91	33.09
Anti-androgen therapy (e.g., spironolactone) is used	Yes	48	17.45
	No	227	82.55
Referral for fertility treatment (IVF/ART) when indicated	Yes	53	19.27
	No	222	80.73
Use of multi-disciplinary clinic (Ob/Gyn + Endo + Nutrition)	Yes	71	25.82
	No	204	74.18

Challenges to diagnosis and management (Table 4) included limited access to biochemical tests (65.1%) and low patient awareness or delayed presentation (55.3%). Almost half (48.7%)

reported limited ultrasound access, while 44.0% cited inadequate training, and 35.3% highlighted the absence of clear local guidelines.

Table 4: Key perceived challenges to diagnosis and management of PCOS.

Challenge	Response (Yes)	Percentage (%)	Response (No)	Percentage (%)
Limited access to biochemical tests (cost/availability)	179	65.09	96	34.91
Limited access to pelvic ultrasound at the point of care	134	48.73	141	51.27
Patients' low awareness / delayed presentation	152	55.27	123	44.73
Inadequate training on PCOS among non-specialists	121	44	154	56
Lack of clear local protocols/guidelines	97	35.27	178	64.73

Knowledge and perception items (Table 5) revealed high agreement that PCOS has both reproductive and metabolic consequences (Mean=4.14±0.62) and that lifestyle modification is first-line therapy (Mean=4.06±0.59). Insulin resistance as a pathogenetic factor was also well recognized (Mean=3.92±0.74).

However, perceptions were more divided on the necessity of biochemical androgen testing (Mean=3.12±0.95), and institutional support was rated low (Mean=2.41±1.03). The composite knowledge score was 3.62±0.58.

Table 5: Knowledge and perception items on PCOS.

Statement	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	Mean ± SD
PCOS is primarily a reproductive disorder but has metabolic consequences	5 (2.0)	8 (3.2)	20 (8.0)	150 (60.0)	67 (26.8)	4.14 ± 0.62
Insulin resistance is a common pathogenetic factor in PCOS	7 (2.8)	15 (6.0)	40 (16.0)	135 (54.0)	53 (21.2)	3.92 ± 0.74
The Rotterdam criteria (2 of 3 features) are sufficient for diagnosis	12 (4.8)	42 (16.8)	68 (27.2)	92 (36.8)	36 (14.4)	3.48 ± 0.88
Biochemical androgen testing is essential for all suspected PCOS cases	20 (8.0)	55 (22.0)	75 (30.0)	72 (28.8)	28 (11.2)	3.12 ± 0.95
Lifestyle modification is first-line management for overweight PCOS cases	5 (2.0)	10 (4.0)	22 (8.8)	148 (59.2)	65 (26.0)	4.06 ± 0.59
Metformin is effective for metabolic and ovulatory dysfunction	10 (4.0)	35 (14.0)	55 (22.0)	110 (44.0)	40 (16.0)	3.54 ± 0.81
There is adequate institutional support to manage PCOS at our facility	55 (22.0)	70 (28.0)	65 (26.0)	45 (18.0)	15 (6.0)	2.41 ± 1.03
Continuing professional training on PCOS is needed	2 (0.8)	5 (2.0)	18 (7.2)	140 (56.0)	85 (34.0)	4.23 ± 0.55
Composite knowledge score						3.62 ± 0.58

Note*: (Responses coded: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree)

Correlation analysis (Table 6) showed that knowledge scores were positively correlated with years of practice ($r=0.34$, $p < 0.001$), age ($r=0.21$, $p=0.001$), number of PCOS patients seen monthly ($r=0.29$, $p < 0.001$), and professional cadre seniority ($r=0.37$, $p < 0.001$).

Associations between categorical variables (Table 7) demonstrated that knowledge adequacy significantly varied

across cadres ($\chi^2=18.45$, $p=0.001$) and years of practice with use of Rotterdam criteria ($\chi^2=12.37$, $p=0.015$), but not by gender ($p=0.159$). Logistic regression (Table 8) confirmed that consultants (AOR=2.84, $p=0.003$), clinicians with >10 years of practice (AOR=1.78, $p=0.029$), those aged >35 years (AOR=1.62, $p=0.045$), and those who saw ≥ 5 PCOS patients monthly (AOR=2.11, $p=0.007$) had higher odds of adequate knowledge.

Table 6: Correlation analysis (Pearson's r)-knowledge score vs selected variables.

Variable pair	Pearson r	p-value
Knowledge score-Years in practice (continuous)	0.34	< 0.001
Knowledge score-Age (years)	0.21	0.001
Knowledge score-Number of PCOS patients seen per month	0.29	< 0.001
Knowledge score-Cadre (ordinal: nurse < resident < consultant)	0.37	< 0.001

Table 7: Associations between Categorical Variables.

Comparison	Chi-square (χ^2)	df	p-value
Cadre (Consultant/Resident/Nurse/Lab/Other) vs adequate knowledge ($\geq$ median)	18.45	4	0.001
Years of practice category vs routine use of Rotterdam criteria (yes/no)	12.37	4	0.015
Gender vs routine biochemical testing (yes/no)	1.98	1	0.159

Table 8: Multivariable logistic regression: predictors of adequate knowledge

Predictor	Adjusted OR	95% CI	p-value
Age > 35 years	1.62	1.01 - 2.61	0.045
Consultant (vs others)	2.84	1.43 - 5.64	0.003
Years of practice > 10	1.78	1.06 - 2.98	0.029
≥ 5 PCOS patients/month	2.11	1.22 - 3.64	0.007

The qualitative findings (Tables 9 and 10) reinforced the quantitative results. Themes highlighted included variable understanding of PCOS as both a reproductive and metabolic disorder; diagnostic challenges due to cost and availability of

tests, gaps in management, such as lack of nutritionist support, and the need for continuing training and local guidelines. Patient-related barriers such as stigma, delayed presentation, and focus on infertility were also emphasized.

Table 9: Qualitative participant breakdown.

Participant group	Frequency	Percentage (%) of qualitative sample
In-Depth Interviews (IDI)	20	—
Consultants (Ob/Gyn, Endo)	8	40
Residents	6	30
Nurses / Midwives	4	20
Laboratory scientists	2	10
Focus Group Discussions (FGDs)	3 FGDs; total participants = 21	—
FGD 1 (Nurses)	6	28.57
FGD 2 (Residents)	8	38.1
FGD 3 (Mixed cadres)	7	33.33

Note*: (Total qualitative participants = 41 across IDIs + FGDs.)

Table 10: Thematic Summary.

Major theme	Sub-theme(s)	No. of participants referencing (n)	Illustrative quote (short)
Knowledge & conceptualization of PCOS	Understanding of reproductive vs metabolic aspects; etiological beliefs	34	"Most of us think PCOS is a reproductive issue, but we now see the metabolic link-insulin resistance is common." (Consultant, IDI-3)
Diagnostic challenges	Cost/availability of tests; non-standardized protocols; ultrasound access	29	"Many patients cannot afford androgen profiles, so we rely on ultrasound and clinical features." (Resident, FGD-2)
Management & treatment gaps	Emphasis on lifestyle; limited access to anti-obesity services; inconsistent drug choices	26	"We counsel on diet, but there is no nutritionist clinic to support long-term lifestyle change." (Nurse, IDI-8)
Training & capacity building	Need for CMEs, local guidelines, and interdisciplinary meetings	31	"We need regular training and a clear hospital guideline for PCOS management." (Lab scientist, IDI-12)
Patient factors	Stigma, delayed presentation, and fertility expectations	22	"Patients often present late when infertility becomes obvious-earlier education is needed." (Consultant, IDI-1)

Discussion

This mixed-methods study evaluated Nigerian healthcare providers' knowledge, diagnostic practices, and management approaches for Polycystic Ovary Syndrome (PCOS). A substantial majority (74.2%) of respondents reported awareness of the Rotterdam criteria, while far fewer reported familiarity with the NIH (50.6%) or Androgen Excess Society criteria (31.3%). The predominance of Rotterdam knowledge aligns with international practice trends: the Rotterdam consensus remains the most widely used set of diagnostic criteria and underpins recent evidence-based PCOS guidelines, which note that clinicians commonly rely on Rotterdam definitions in routine care [8]. Our finding that awareness falls progressively for NIH and AES criteria mirrors the literature showing variability in clinicians' familiarity with alternative definitions and the practical dominance of Rotterdam in many settings [8]. Although 60.7% of participants reported routine use of pelvic ultrasound, only 44.7% routinely ordered biochemical androgen profiles, and just over half (51.3%) used fasting glucose/OGTT for metabolic screening. These patterns reflect a pragmatic reliance on clinical assessment and ultrasound when biochemical assays are unavailable or unaffordable—a theme prominent in the qualitative data, where cost and test-availability were repeatedly raised as constraints. Several recent reviews and primary studies have documented exactly this tension: in resource-constrained environments, clinicians often depend on clinical and sonographic features because high-quality androgen assays and standardized labs are not universally accessible [9]. In particular, global examinations of diagnostic barriers emphasize that the limited availability of reliable androgen and AMH assays and variable ultrasound quality remain key obstacles to consistent, guideline-concordant diagnosis [9].

Comparison with regional studies supports these interpretations. Studies from other sub-Saharan and LMIC contexts

have similarly reported reliance on clinical/ultrasound findings, frequent inability to perform comprehensive biochemical testing, and delays in diagnosis driven by patient cost and limited local laboratory capacity. For example, multi-centre reports from nearby African settings and clinic-based Nigerian data emphasize ultrasound and clinical evaluation as the most practicable tools in many facilities [5]. Our study quantifies this phenomenon among a broad cross-section of cadres and confirms that access constraints (65.1% identifying limited biochemical test access as a challenge) are a major, system-level problem. Lifestyle counselling was the most commonly reported routine intervention (80.4%), which is broadly consistent with international recommendations that lifestyle modification be the first-line intervention for overweight and obese women with PCOS and with many local management frameworks [8]. The high uptake of lifestyle counselling in our sample is encouraging and aligns with both guideline emphasis and findings from other LMIC reports, where non-pharmacologic counselling is feasible even when advanced services are not. Nevertheless, qualitative comments and the low reported availability of nutrition services signal that counselling is often delivered without structured, long-term multidisciplinary support, a limitation noted in other low-resource studies [10].

Pharmacologic choices in our sample show that Combined Oral Contraceptives (COCs) are commonly used for menstrual regulation (66.9%) and that metformin is prescribed by roughly half (50.6%) of providers. This pattern resonates with systematic reviews showing the continued centrality of COCs for cycle control and the widespread use of metformin for metabolic and ovulatory indications, although the magnitude and indications for metformin vary by clinician and setting. Recent meta-analyses report that metformin has benefits for metabolic and ovulatory dysfunction in selected patients and remains commonly co-prescribed with hormonal therapy [11]. The relatively low use of anti-androgen agents (17.5%) and of referral pathways for fertility treatment

(19.3%) likely reflects both safety/contraindication considerations, accessibility/cost of specialist reproductive services, and variable clinician comfort with anti-androgen prescriptions—an observation consistent with prior reports from Nigeria and similar settings [10]. Only 25.8% reported use of multidisciplinary clinics (Ob/Gyn + Endo + Nutrition), and a majority (66.6%) did not routinely refer complex cases to endocrinology. International guidelines emphasise multidisciplinary, integrated care for PCOS, including endocrinology input for complex metabolic cases and nutrition support for lifestyle interventions; however, implementing such models in many LMIC contexts is constrained by workforce, infrastructure, and financing [8]. Our qualitative theme of training and capacity gaps, with frequent calls for CMEs and local protocols, supports the quantitative finding that multidisciplinary and referral pathways are underdeveloped and suggests concrete system targets for improvement.

Knowledge scores were positively correlated with years in practice, age, cadre seniority, and the number of PCOS patients seen per month, and consultants and those with >10 years practice had higher adjusted odds of adequate knowledge. These associations align with broader literature showing that specialty training, clinical experience, and frequent exposure to a condition predict higher knowledge and guideline-concordant practice. Studies of physician knowledge gaps in PCOS have repeatedly found that specialists (e.g., endocrinologists, reproductive endocrinologists, and senior Ob/Gyns) are more likely than generalists and early-career staff to use comprehensive diagnostic testing and to be familiar with the range of management options [12]. Our findings therefore confirm that targeted education of early-career clinicians and non-specialists could narrow knowledge gaps and improve adherence to evidence-based care. More than half the respondents identified low patient awareness and delayed presentation as impediments; qualitative data similarly highlighted stigma and fertility expectations as drivers of late care-seeking. These patient-level barriers are well documented: women frequently seek care only when infertility becomes a pressing issue, and dissatisfaction with healthcare experiences can drive alternative information-seeking. Addressing community awareness and reducing stigma are repeated recommendations in the PCOS literature, especially where sociocultural expectations about fertility shape help-seeking [13].

Conclusion

Healthcare providers in Nigeria demonstrate solid conceptual recognition that PCOS spans reproductive and metabolic domains and commonly employ lifestyle counselling and COCs. Yet diagnostic and management gaps remain, especially limited biochemical testing, suboptimal referral/multidisciplinary care, and uneven knowledge across cadres. Addressing these gaps will require pragmatic investments in diagnostics, structured CME and locally adapted guidelines, and system strategies to embed multidisciplinary support, measures that are consistent with international guidance and regional calls to action for LMICs.

Acknowledgements

None.

Conflict of Interest

None.

References

1. Singh S, Pal N, Shubham S, Sarma D K, Verma V, et al. (2023) Polycystic Ovary Syndrome: Etiology, Current Management, and Future Therapeutics. *Journal of Clinical Medicine* 12(4): 1454.
2. Teede HJ, Tay CT, Laven JJ, Dokras A, Moran LJ, et al. (2023) Recommendations From the 2023 International Evidence-based Guideline for the Assessment and Management of Polycystic Ovary Syndrome. *The Journal of Clinical Endocrinology & Metabolism* 108(10): 2447-2469.
3. Oladosu WO, Jimoh OS, Adeniyi WA, Alayo AM, Ahmed AO, (2022) Pattern of common hormonal disorders among patients with polycystic ovarian syndrome at a tertiary health facility in Nigeria. *Nigerian Journal of Medicine* 31(1): 92-97.
4. Erku EW, Yanni MM, Mohamed HM, Weldehawaria SF, Asfaw EM, et al. (2025) Knowledge, Attitude, and Practice of Polycystic Ovarian Syndrome Diagnosis among Health Care Providers in Addis Ababa, Ethiopia. *BMC women's health* 25(1): 414.
5. Teede HJ, Misso ML, Costello MF, Dokras A, Laven J, et al. (2018) Recommendations from the international evidence-based guideline for the assessment and management of polycystic ovary syndrome. *Human reproduction (Oxford, England)* 33(9): 1602-1618.
6. Anosike C, Okoye CO, Isiogugu NO, Anene Okeke CG, Ugochukwu EJ, et al. (2025) Impact of video-based educational intervention on knowledge and perception of polycystic ovarian syndrome among pharmacy students: A pre-post interventional study. *BMC Medical Education* 25: 758.
7. Akwuruoha EM, Ezirim EO, Amah CI, Onyemereze CO, Airaodion AI (2025) Prevalence and awareness of premature ovarian insufficiency among Nigerian women. *Journal of Women Health Care and Gynecology* 5(5): 1-8.
8. Christ JP, Cedars MI (2023) Current Guidelines for Diagnosing PCOS. *Diagnostics (Basel, Switzerland)* 13(6): 1113.
9. Joham AE, Tay CT, Laven J, Louwers YV, Azziz R (2025) Approach to the Patient: Diagnostic Challenges in the Workup for Polycystic Ovary Syndrome. *The Journal of clinical endocrinology and metabolism* 110(7): e2298-e2308.
10. Igwegbe AO, Eleje GU, Enechukwu CI (2013) Polycystic ovary syndrome: A review of management outcomes in a low resource setting. *Journal of Women's Health, Issues & Care* 2(3): 110.
11. Melin J, Forslund M, Alesi S, Piltonen T, Romualdi D, et al. (2024) Metformin and Combined Oral Contraceptive Pills in the Management of Polycystic Ovary Syndrome: A Systematic Review and Meta-analysis. *The Journal of clinical endocrinology and metabolism* 109(2): e817-e836.
12. Dokras A, Saini S, Gibson Helm M, Schulkin J, Cooney L, et al. (2017) Gaps in knowledge among physicians regarding diagnostic criteria and management of polycystic ovary syndrome. *Fertility and Sterility* 107(6): 1380-1386.e1.
13. Hoyos LR, Putra M, Armstrong AA, Cheng CY, Riestenberg CK, et al. (2020) Measures of patient dissatisfaction with health care in polycystic ovary syndrome: Retrospective analysis. *Journal of Medical Internet Research* 22(4): e16541.