



Diagnosis and Management of Polycystic Ovary Syndrome: A Survey of Physicians from the Middle East and Africa

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J Diabetes Endocrine Practice 2022;5:104–111.

Abstract

Keywords

- ▶ polycystic ovary syndrome
- ▶ clinical practices
- ▶ metabolic syndrome
- ▶ antiandrogens
- ▶ MENA region
- ▶ Africa

Background Studies from several regions examined the approach to diagnosing and managing polycystic ovary syndrome (PCOS). Limited data are available from the Middle East and Africa (MEA).

Objective The aim of this study was to understand the practice pattern for diagnosing and managing PCOS by relevant specialists across the MEA region.

Methods We used an online survey consisting of an established questionnaire. The questionnaire consisted of 25 questions grouped to capture information on (a) the characteristics of the respondents, (b) patients with PCOS seen by respondents, (c) the diagnostic criteria, (d) biochemical parameters for differential diagnosis of hyperandrogenism, (e) long-term concerns, and, finally (f) management choices.

Results A total of 190 questionnaires were available for final analysis; 73.7% of the respondents were senior physicians; 59.5% and 17.4% were endocrinologists and gynecologists, respectively. Menstrual irregularity was the most frequent criterion

DOI <https://doi.org/10.1055/s-0042-1759643>.
 ISSN 2772-7653.

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used for the diagnosis of PCOS (90.5%), followed by hirsutism (75.7%), and biochemical hyperandrogenism (71.4%). Dehydroepiandrosterone was the most frequent biochemical parameter used for the differential diagnosis of hyperandrogenism (52.4%) followed by total testosterone (45.4%). Obesity and type 2 diabetes mellitus were the principal long-term concerns for PCOS (45.1%), followed by infertility (29.9%). Metformin was the most commonly prescribed treatment (43.8%), followed by lifestyle modification (27.0%), and oral contraceptives (18.9%). Infertility treatments include metformin alone, clomiphene citrate alone, or their combination prescribed by 23.1, 9.9, or 52.7%, respectively, whereas only 3.8% contemplated ovulation induction. Some differences and similarities were observed in previous studies, including gynecologists and endocrinologists.

Conclusions This survey provides a baseline for the perspective in diagnosing and treating PCOS in the MEA region. Some deviation is observed from mainline recommended practices. More education on PCOS diagnostic criteria and treatment of PCOS is needed in line with the recently published evidence international guideline.

Introduction

Polycystic ovary syndrome (PCOS) is the most common endocrine–metabolic disorder in women of reproductive age.^{1,2} PCOS is characterized by clinical or biochemical hyperandrogenism, anovulation, and polycystic ovaries.^{1–3}

Women with PCOS are at increased risk of various metabolic, atherosclerotic, and gynecological disorders. Metabolic complications include impaired glucose tolerance, type 2 diabetes mellitus (T2DM), hepatic steatosis, hypertension, and dyslipidemia. Atherosclerotic complications include vascular thrombosis, cerebrovascular accidents, and ischemic heart disease. Gynecological complications include subfertility and a high risk of miscarriage, gestational diabetes, endometrial atypia or carcinoma, and possibly ovarian malignancy.^{1–4} Hence, it is critical that health care professionals understand the complexity of this condition and the need for accurate diagnosis, appropriate management, and coordinated care.

Evaluation of patients suspected of having PCOS includes clinical assessment for the presence of hirsutism, ovarian ultrasonography, and laboratory hormonal assessment to confirm hyperandrogenism and oligo-anovulation and to exclude other similar disorders.^{1–4} Traditionally, the treatment of patients with PCOS has focused on the relief of symptoms and is set according to the management goal: relief of hyperandrogenic symptoms, regulation of menstruation, and restoration of fertility.^{1–4} Despite significant progress in understanding the pathophysiology of PCOS over the past two decades, it remains underdiagnosed by many practitioners.¹ Management of PCOS is complex and should include the relief of symptoms and the screening and treatment of chronic metabolic, atherosclerotic, and gynecological complications.⁵

Due to the different phenotypes of women with PCOS and the different interests of expert groups, guidelines have pointed physicians in different directions to diagnose and manage PCOS.^{6–12} To ascertain the practice pattern of relevant physicians, several studies from Europe, Australia, and

North America have examined the awareness and management of PCOS among various groups of physicians.^{12–16} However, results from these studies may not be generalizable. Therefore, we surveyed to understand the common approach in diagnosing and managing PCOS by relevant specialists across the Middle East and Africa (MEA) region. We aimed to establish the baseline practice and identify areas for improvement and future research. Furthermore, we aimed to compare the results from the MEA region with those from European Society of Endocrinology (ESE) survey.¹³

Materials and Methods

Objectives

We aimed to document current practices in the general approach to diagnosing and managing PCOS by physicians from the MEA region in relevant specialities and also compare the practice in MEA with published guidelines.

Target Population

In the absence of a single MEA regional endocrine society with a membership list that can define a study population, the target population was identified from a list of electronic mails pooled from continuous professional development delegates, speakers, authors, or members of various scientific groups or forums in various parts of the MEA region in addition to personal contacts of the authors who are identified to practice in the target disciplines. Consequently, several questions were added to the PCOS survey to help define the demographic and professional profiles of the respondents and their practices, similar to our previously published surveys (17–20).

Survey Management

We used a web-based commercial survey management service (Survey Monkey, Palo Alto, California, United States). All participants received an initial email or a link that

explained the rationale of the survey and what was required from the consented respondents, followed by three subsequent reminder emails/messages during the study period. Each message included the principal investigator's full credentials and contact details and a unique email-specific electronic link to the questionnaire. The survey web site was open for 2 months from 1st February 2020 to 31st March 2020. Finally, survey responses were collected and stored electronically for an anonymous analysis.

Survey Questionnaire

The questionnaire was anonymous. The detailed questionnaire is included in the supplementary material (► **Supplementary Appendix 1**, available in the online version). The PCOS survey questions were adapted from ESE PCOS Special Interest Group's Questionnaire,¹³ also used in the Nordic survey.¹⁶ It included general information about respondents, respondents' general information about PCOS, diagnostic criteria for PCOS, clinical management, and long-term health implications.

Data Analysis

Responses from outside the target group (e.g., students, nurses, and those from outside the MEA regions) or substantially incomplete not including adequate information on the PCOS were excluded ($n=60$). The rest ($n=190$) were included. Summary statistics were prepared for responses to each question. Because not every participant answered all questions, the percentage of respondents providing a given answer was calculated individually for each question, using the number of respondents to that question as the denominator.

Results

General Characteristics of the Respondents

A total of 250 agreed to participate, and one-hundred ninety responses were included in the final analysis. No data were available on nonrespondents, and those with substantially incomplete questionnaires were excluded from the analysis. Most of the responses were from the Arabian Gulf (64.7%), followed by the rest of the Middle East (18.4%) and North Africa (10.5%) (► **Table 1**). However, most of the responses were from four countries: Saudi Arabia (59), Qatar (33), Iraq (33), and the United Arab Emirates (22). This was followed in decreasing order by Egypt (7), Sudan (6), South Africa (5), Libya (5), Bahrain (4), Nigeria (3), Lebanon (2), Morocco (2), Oman (2), Kenya (2), Kuwait (2), Mali (1), Uganda (1), and Zimbabwe (1). They were 105 males (55.3%) and 85 females (44.7%). The majority were between 41 to 50 and 31 to 40 (35.2 and 31.1%, respectively) (► **Table 1**). Most of the respondents (82.1%) work in public services in tertiary hospitals (69.5%). Endocrinologists were the most common specialty 113 (59.5%), followed by obstetrics and gynecology 33 (17.4%) (► **Table 1**).

Awareness of the PCOS Clinical, Psychosocial, and Lifestyle Management

Infertility was the most common reason for clinic attendance for PCOS. The second most common reason for clinic atten-

Table 1 The respondents' demographic and professional profiles

Questions and predetermined responses		Results ^a
Sex	Male	105 (55.3%)
	Female	85 (44.7%)
Age group	<30 years	28 (14.8%)
	31–40 years	59 (31.1%)
	41–50 years	67 (35.2%)
	51–60 years	39 (20.7%)
	> 60 years.	18 (9.5%)
Region of residence and practice	Arabian Gulf	123 (64.7%)
	Rest of the Middle East	35 (18.4%)
	North Africa	20 (10.5%)
	Sub-Saharan Africa	12 (6.3%)
Practice setting	University/tertiary hospital	132 (69.5%)
	Community hospital or nonteaching	35 (18.4%)
	Primary care	18 (9.5%)
	Special services	5 (2.6%)
Type of practice	Mainly public	158 (82.1%)
	Mainly private	34 (17.9%)
Specialty	Endocrinology	113 (59.5%)
	Obstetrics and gynecology	33 (17.4%)
	Family medicine/ General practice	16 (8.4%)
	General medicine and subbranches	15 (7.9%)
	Other	13 (6.8%)
Career stage (grade)	Senior	140 (73.7%)
	Mid-grade	50 (26.3%)
Sex	Male	55.3%105
	Female	44.7%85
Number of PCOS patients seen previous year	<25	86 (45.3%)
	25–50	60 (31.6%)
	50–100	21 (11.1%)
	101–200	15 (7.9%)
	>200	8 (4.2%)

Abbreviation: PCOS, polycystic ovary syndrome.

^aResponses are expressed as absolute frequency (numbers) and relative frequencies (%).

dance was obesity and T2DM (► **Table 2**). Scalp hair loss was the least reported feature of PCOS (► **Table 2**).

Tendency to gain weight and trouble losing weight in affected women was commonly recognized as well as the effect of weight loss and exercise on PCOS symptoms. The most common comorbidities were reduced fertility, T2DM, gestational diabetes, insulin resistance, and cardiovascular disease risk factors. Compared with other features related to PCOS, the reduction of psychosocial well-being in PCOS was

Table 2 The respondents' awareness of the clinical features, psychosocial well-being, and lifestyle management and comorbidities of PCOS

Questions and predetermined responses	Responses ^a
Frequency of symptoms and signs believed to be associated with PCOS?	
Irregular menstrual cycles/periods	185 (97.4%)
Excess hair growth	171 (90.0%)
Acne	155 (81.6%)
Increased tendency for weight gain	141 (74.2%)
Improvement of symptoms after weight loss	133 (70.0%)
Difficulty losing weight	125 (65.8%)
Scalp hair loss/male pattern-baldness	94 (49.5%)
Body image dissatisfaction	92 (48.4%)
Depression	91 (47.9%)
Reduced quality of life	68 (35.8%)
Improvement of symptoms with exercise	64 (33.7%)
Anxiety	64 (33.7%)
Improvement of symptoms with a low GI diet	58 (30.5%)
Premenstrual syndrome	15 (7.9%)
Migraines	10 (5.3%)
Which of the following consequences are associated with PCOS?	
Insulin resistance	180 (94.7%)
Reduced fertility	168 (88.4%)
Increased risk of type 2 diabetes	157 (82.6%)
Hormone imbalance	150 (78.9%)
High blood androgen levels	136 (71.6%)
Increased risk of gestational diabetes	109 (57.4%)
Increased risk of cardiovascular disease risk factors	106 (55.8%)
Infertility	100 (52.6%)
Cysts on ovaries	98 (51.6%)
Fatty liver	95 (50.0%)
Sleep apnea and snoring	70 (36.8%)
Endometrial cancer	59 (31.1%)
Complications of pregnancy	52 (27.4%)
Surgery for ovarian cysts	32 (16.8%)
Ovarian cancer	15 (7.9%)

Abbreviations: GI, glycemic index; PCOS, polycystic ovary syndrome.
^aResponses are expressed as absolute frequency (numbers) and relative frequencies (%).

less recognized by health professionals. Indeed, depression and especially anxiety were commonly ranked low in the context of psychosocial features of PCOS. Fatty liver, sleep apnea, pregnancy complications, and risk for endometrial cancer were less commonly known features. The doctors

Table 3 The respondents' views on the diagnosis of PCOS

Questions and predetermined responses	Responses ^a
The perceived age of diagnosis of PCOS	
20–30	155 (82.0%)
< 20	28 (14.8%)
> 30	6 (3.2%)
Criteria used to diagnose PCOS	
Rotterdam	118 (62.1%)
I don't know	30 (15.8%)
Original National Institutes of Medicine (NIH)	23 (12.1%)
Androgen excess and PCOS Society	17 (8.9%)
Other	2 (1.1%)
The most common reason for clinic attendance of patients who were diagnosed with PCOS	
Menstrual disturbances	79 (41.8%)
Hirsutism	63 (33.3%)
Infertility	25 (13.2%)
Obesity	16 (8.5%)
Metabolic disorders	6 (3.2%)
The biochemical parameters used in the differential diagnosis of hyperandrogenism? [185]	
Dehydroepiandrosterone sulfate (DHEAS)	97 (52.4%)
Total testosterone	84 (45.4%)
17-Hydroxyprogesterone (17-OHP)	64 (34.6%)
Free testosterone (direct measurement)	56(30.3%)
Prolactin	32(17.3%)
Androstenedione	25 (13.5%)
Free androgen index (FAI)	23 (12.4%)

Abbreviation: PCOS, polycystic ovary syndrome.

^aResponses are expressed as absolute frequency (numbers) and relative frequencies (%). Responses are reordered in decreasing frequencies.

were generally well informed that ovarian cancer is unrelated to PCOS. About 16.8% of the participants reported an association between surgery for ovarian cysts and PCOS (► **Table 2**). The patient's age at the first visit and diagnosis was less than 20 years for 14.8% of the respondents, between 20 and 30 years for 82.0%, and more than 30 years for the remainder. The irregular menstrual cycle was the most commonly reported clinical feature (► **Table 3**).

Diagnostic Criteria of PCOS

As summarized in ► **Table 4**, respondents selected menstrual irregularity as the most common and useful criterion for diagnosing PCOS (90.5%), followed by hirsutism and biochemical hyperandrogenism (75.7 and 71.4%, respectively). Ovarian ultrasonography was routinely used by 63.2% of the respondents. While anti-Müllerian hormone is not included in the diagnostic workup of PCOS by any professional recommendations, it was ordered "sometimes" or "often" by 29.5% of the respondents (► **Table 4**).

Table 4 Frequency in the use of categorical criteria to diagnose PCOS in the present study and the 2014 ESE survey

Criterion	Respondents		Responses (%)							
			Never		Rarely		Sometimes		Often	
	MEA	ESE	MEA	ESE	MEA	ESE	MEA	ESE	MEA	ESE
Hirsutism	189	351	2.6%	1.7%	1.1%	4.3%	20.6%	23.6%	75.7%	70.4%
Menstrual disturbances	190	352	0.5%	0.9%	0.0%	0.3%	8.9%	11.4%	90.5%	87.5%
Biochemical hyperandrogenism	189	354	0.0%	0.8%	5.3%	3.9%	23.3%	16.1%	71.4%	79.1%
Ovarian ultrasonography	190	350	1.1%	2.9%	9.5%	8.9%	26.3%	24.9%	63.2%	63.4%
Anti-Müllerian hormone	190	345	41.2%	56.8%	29.4%	25.5%	20.9%	12.2%	8.6%	5.2%

Abbreviations: PCOS, polycystic ovary syndrome; MEA, Middle East and Africa, Euro (European data (Conway et al 2014).

Differential Diagnosis of Hyperandrogenism

The question about the two most common biochemical indices to be used in the differential diagnosis of hyperandrogenism produced some heterogeneity in the responses, leading to wide different choices (►Table 3). However, respondents did not abide by selecting only two answers. The common three choices included dehydroepiandrosterone sulfate (DHEAS), total testosterone and 17 hydroxyprogesterone (17-OHP) in decreasing order (►Table 3). Notably, 56 (21.4%) of the respondents included direct measurement of free testosterone. In general, respondents chose the combination of DHEAS with total testosterone (25.7%) and DHEAS with 17-OHP (18.3%) and the combination of total testosterone and 17-OHP (13.1%) to perform the differential diagnosis of hyperandrogenism. Other combinations were less commonly recommended.

Burden and Concerns about PCOS

The prevalence in participants' countries was estimated as lower than 10% for 21.6% of the respondents, between 10 and 20% for 57.9% of them and, finally, as higher than 20% for the remainder (►Table 5). About 44.2% of participants thought PCOS is underdiagnosed, and 25.8% thought it is overdiagnosed. The majority (93.9%) replied that, in each patient, they enquired about a family history of PCOS and T2DM and cardiovascular disease (CVD). The number of patients with PCOS seen by the respondents in the previous year ranged from less than 25 in 45% of respondents, from 25 to 50 in 31.6% of cases, from 50 to 200 in 19.0% of cases, and more than 200 in the remainder (►Table 5). The results are shown for the present survey in ►Table 5 and in comparison with the ESE survey (14) and Nordic survey (17) in ►Fig. 1. Obesity and T2DM were the principal long-term concerns for PCOS (45.1%). Less concern was afforded to infertility (29.9%). The risk of CVDs was also taken into account by 12.0% of respondents. In contrast, very few respondents selected endometrial cancer or psychosocial problems as primary concerns (►Table 5, ►Fig. 1).

Treatment Choices

The reported treatment choices are shown for the present survey in ►Table 6 and in comparison with the ESE survey (14) and Nordic survey (17) in ►Fig. 2. For the overall treatment of PCOS, the respondents' first choice was metfor-

Table 5 The respondents' views on the burden and long-term concerns of PCOS

Questions and predetermined responses	Responses ^a
The prevalence of PCOS in your country	
11–20%	110 (57.9%)
0–10%	41 (21.6%)
21–30%	39 (20.5%)
Do you think that women with PCOS are correctly diagnosed?	
No, I think PCOS is under-diagnosed	84 (44.2%)
Yes, I think that PCOS is correctly diagnosed	49 (25.8%)
No, I think PCOS is over-diagnosed	49 (25.8%)
I don't know	8 (4.2%)
What is the most important long-term concern about PCOS? (184)	
Obesity a type 2 diabetes	83 (45.1%)
Infertility	55 (29.9%)
Cardiovascular diseases	22 (12.0%)
Endometrial cancer	16 (8.7%)
Psychosocial problems	4 (2.2%)
Other	4 (2.2%)
Enquiring from patients about family history of diabetes, cardiovascular disease, and/or PCOS? (185)	
Yes	172 (93.0%)
No	13 (7.0%)
Importance of training in managing PCOS? (184)	
Very important	124 (67.4%)
Important	53 (28.8%)
Neutral	6 (3.3%)
Unimportant	0 (0.0%)
Very unimportant	1 (0.5%)

Abbreviation: PCOS, polycystic ovary syndrome.

^aResults are expressed as frequency (Percentage) in decreasing order whenever appropriate.

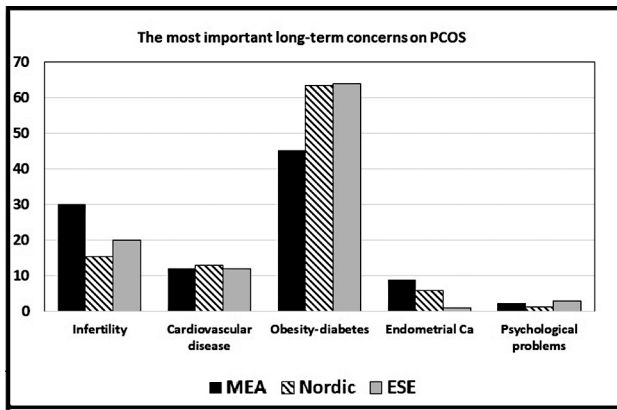


Fig. 1 Comparison between the present study (Middle East and Africa, MEA), the Nordic polycystic ovary syndrome (PCOS) survey (Nordic) the 2014 ESE European survey (ESE) for the perceived important long-term complications of PCOS.

Table 6 The respondents' views on the long-term concerns and the management of PCOS

Questions and predetermined responses	Responses ^a
Treatments prescribed for patients with PCOS (not specifically for fertility)? (185)	
Metformin	81 (43.8%)
Lifestyle	50 (27.0%)
Oral contraceptives	35(18.9%)
Antiandrogens	19(10.3%)
Laser depilation	0 (0.0%)
Treatments prescribed for patients with PCOS regarding fertility? (182)	
Clomiphene citrate + metformin	96 (52.7%)
Metformin	42 (23.1%)
Lifestyle modifications	19 (10.4%)
Clomiphene citrate	18 (9.9%)
Ovulation inductors	7(3.8%)

Abbreviation: PCOS, polycystic ovary syndrome.

^aResults are expressed as frequency (Percentage) in decreasing order whenever appropriate.

min (43.8%), followed by lifestyle modification (27.0%) and oral contraceptives (18.9%). Antiandrogens were prescribed by 10.3%, and none of the respondents chose cosmetic procedures for hirsutism (►Table 6). Metformin with clomiphene citrate or metformin was chosen as a first-line intervention for fertility problems by 52.7 and 23.1% of respondents, respectively. Lifestyle modification and clomiphene only were used less often (10.4 and 9.9%, respectively). Only 3.8% used other methods for ovulation induction (►Table 6). However, most respondents selected multiple treatments for each of the two questions. ►Fig. 2 shows the comparison of the present study, the Nordic PCOS Survey, and the 2014 European survey for the general treatment of PCOS regardless of fertility and treatment for fertility

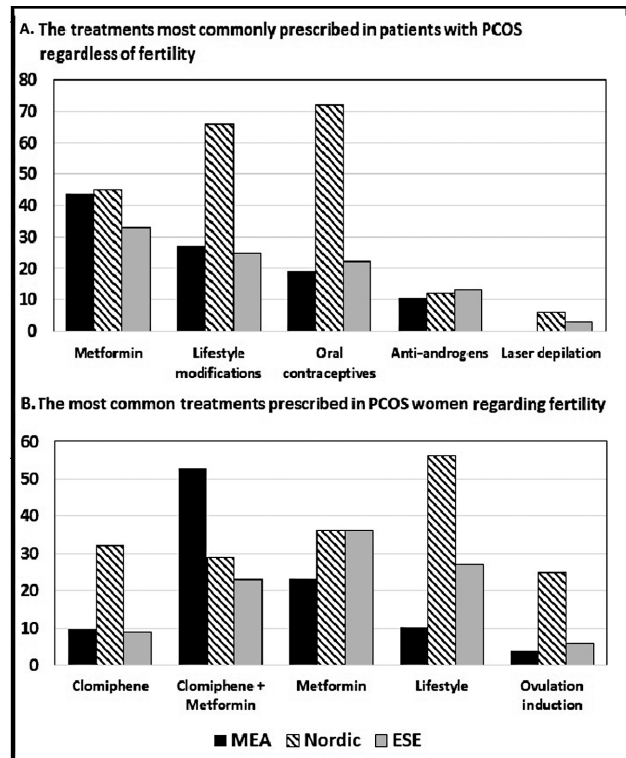


Fig. 2 Comparison between the present study (Middle East and Africa, MEA), the Nordic polycystic ovary syndrome (PCOS) survey (Nordic) the 2014 ESE European survey (ESE) for the general treatment of PCOS regardless of fertility (A) and treatment for fertility (B).

Discussion

Worldwide, there is an increasing interest among doctors in disorders characterized by androgen excess in women and specifically PCOS. Gynecologists retain a major interest in the subject, as documented by the major diagnostic consensus on PCOS. On the other hand, androgen excess per se and related metabolic issues are typical areas of endocrinological interest. The current survey by an endocrine group reflects the interest of endocrinologists in the MEA region in the field.

Irregular menstrual cycle and clinical hyperandrogenism were the commonest symptoms and signs in the present survey, similar to the ESE survey's finding of PCOS by specialists across Europe.¹⁴ This is plausible since the prevalence of PCOS is the most common cause of hirsutism in women of Arab descent.¹⁷ Although the general prevalence of PCOS in MEA is not widely studied, the perception of the prevalence of the condition in the majority of the participants is 20% consistent with some published data¹⁸ Therefore, treating physicians should be conversant with the updated diagnostic and management guidelines. Nonetheless, the international guidelines have a wide gap in knowledge about the diagnostic criteria and the recommended biochemical and radiological investigations.

The various surveys of PCOS included different proportions of gynecologists and endocrinologists. For instance, in the present survey, most respondents were endocrinologists, similar to the ESE study¹³ in North America.¹⁴ However, the majority (70.2%) were ObGyn, and nearly two-thirds (64.4%)

were females, similar to the Nordic study.¹⁵ Most of the North American survey respondents reported a prevalence of 10 to 20%, which is similar to the prevalence reported by most of our respondents. Regarding diagnostic criteria of PCOS, Rotterdam criteria were used by 65.6% in the Dokras study and by 90% of the respondents in our survey. However, as Dokras et al focused on comparing gynecologists and endocrinologists throughout the paper, thus we could not make a direct comparison with their findings. On the other hand, the use of an identical survey instrument allowed comparison of the results of the present study with those of the ESE and the Nordic surveys, as illustrated in **–Figs. 1 and 2.**^{13,15} First, the present study did not follow the consensus on the recommendations of the diagnostic criteria of PCOS. In contrast, National Institute of Health (NIH) guidelines were followed by the European respondents, and Rotterdam criteria were predominantly used in the Nordic study. Second, the management of PCOS patients, regardless of fertility, was prescribed Metformin in the present study. On the other hand, Nordic physicians often recommended lifestyle modification and oral contraceptive pill. Concerning fertility issues in PCOS patients, physicians from the MEA region recommended clomiphene combination with metformin, while European physicians still preferred lifestyle modification primarily to clomiphene and metformin therapy. These are some of the marked differences identified in diagnosing and managing PCOS between the MEA and European studies. Possible explanations for these differences may be linked to cultural barriers in managing fertility issues or environmental barriers in suggesting lifestyle management. However, further research is recommended to identify the rationale and the potential reasons for these differences. Nevertheless, the current study found similarities in the context of long-term consequences related to obesity, diabetes, and infertility as the top three comorbidities and long-term effects of PCOS. However, there was a considerable difference in the prevalence of the comorbidities. Obesity and diabetes were lesser in the MEA region compared with the European region, while infertility was higher in patients with PCOS in MEA.

The study is limited by its survey nature of what respondents state rather than a true quality assurance exercise assessing true practices. Yet, physicians' surveys do provide new information when applied to new settings.^{19–21} The relatively small sample size also limits the survey. However, it remains a valid exploratory exercise to scope the perception of an important clinical condition in our region.^{17,18} Furthermore, the sample is imbalanced, with more endocrinologists than gynecologists. The latter was also in the ESE survey¹³ in contrast to the Nordic survey.¹⁶ However, all three surveys provide complementary information. Nonetheless, a comparison between endocrinologists and gynecologists was not the primary objective of the present study, and it has been specifically addressed in previous studies.^{22–24} Other limitations include introducing a selection bias as only those interested in PCOS could have attempted the survey. It is worth noting that the low response rate may have been attributed to the study period, which coincided with the initial outbreak of the coronavirus disease 2019

pandemic and the generally reduced attention to research activities beyond the pandemic. Furthermore, the wide difference in the responses concerning the ultrasound criteria can be attributed to the potential phrasing ambiguity in identifying PCO morphology by ultrasound by transabdominal versus transvaginal approaches.

Conclusion

This survey provides a baseline for the perspective in diagnosing and treating PCOS in the MEA region. This study emphasizes some heterogeneity in managing PCOS by endocrinologists across the MEA region. It underscores the uncertainties regarding diagnosis and therapeutic approaches to this common but multifaceted condition. Furthermore, the survey produced some useful information. It is noteworthy that a substantial majority of the MEA endocrinologists think they are following the Rotterdam criteria for diagnosing and managing PCOS. In contrast, their actual practice is not consistently so. In addition, the long-term metabolic risks for obesity and T2DM have been well recognized. The popularity of metformin-associated lifestyle intervention may reflect endocrinologists' appreciation of these long-term risks. Finally, although there was an imbalance in the sample with fewer gynecologists than endocrinologists in this study, the findings support previous reports that practice patterns differ by specialty, which might support practice-specific diagnostic criteria for PCOS. Some deviation is observed from internationally recommended practices. More education on PCOS diagnostic criteria and treatment of PCOS is in line with the recently published evidence international guideline. There is also a need for more collaboration among gynecologists and endocrinologists to homogenize and standardize the treatment practices in the MEA.

Authors' Contributions

The named authors meet the International Committee of Medical Journal Editors (ICMJE) criteria for authorship of this manuscript (conception, data collection, and drafting/revision of the article). They take responsibility for the integrity of the work and have given final approval for the version of the manuscript.

Compliance with Ethical Principles

The study was approved by the Institutional Review Board of Sheikh Khalifa Medical City, Abu Dhabi, UAE. Informed consent was received from the participants before they take the questionnaire.

Funding and Sponsorship

No funding was received in the publication of this study.

Conflict of Interest

None declared.

Acknowledgment

The authors are most grateful to all colleagues who participated in the survey.

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