

Community Awareness of Polycystic Ovary Syndrome and Preferences for Video-based Tele-education among Women in Eastern Province, Saudi Arabia

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ABSTRACT

Background: Polycystic ovary syndrome (PCOS) affects 10-16% of Saudi women of reproductive age. Limited awareness and a lack of evidence-based information contribute to delayed diagnosis. Understanding regional health literacy and preferred educational strategies is essential for improving awareness and promoting early diagnosis.

Objectives: To assess awareness and knowledge of PCOS, examine the relationship between sociodemographic factors and PCOS knowledge, and identify preferred methods for delivering PCOS-related health information.

Materials and methods: A community-based cross-sectional study was conducted in the Eastern Province of Saudi Arabia. Using convenience and snowball sampling, 335 women completed a self-administered Arabic questionnaire assessing sociodemographic data, PCOS awareness, knowledge (score range 0–26), and educational preferences. Descriptive statistics and Kruskal-Wallis tests were used for analysis, with epsilon-squared (ϵ^2) used to estimate effect sizes.

Results: Overall PCOS awareness was 83.3% ($n = 279$), with a mean knowledge score of 13.1 ± 5.02 . Age ($\chi^2 = 24.9$, P -value < 0.001 , $\epsilon^2 = 0.0746$) and education level ($\chi^2 = 8.03$, P -value $= 0.045$, $\epsilon^2 = 0.0240$) were significantly associated with knowledge scores, with younger women (18–24 years) achieving higher scores. Social media/internet (38.8%) was the most common information source, followed by family/friends (26.3%) and healthcare providers (21.2%). Video-based internet education was preferred by 57.9% of participants, and 60.3% rated it as highly effective. Traditional lectures and printed materials were less favored.

Conclusion: Older and less educated women demonstrated lower PCOS awareness. The strong preference for video-based education highlights the potential value of culturally tailored tele-education programs in improving PCOS knowledge, encourage earlier diagnosis, and support reproductive health initiatives.

Keywords: Polycystic ovary syndrome; Telehealth; Health awareness; Women's health.

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INTRODUCTION

Polycystic ovary syndrome (PCOS) is the most prevalent endocrine disorder among women of reproductive age in the world, ranging from 5% to 26% prevalence, depending on the diagnostic cri-

teria and population [1]. PCOS is a multifaceted and diverse condition with reproductive, metabolic, and psychological consequences that can have a profound impact on a woman's health and quality of life [2]. However, PCOS is a significant public health problem in the Middle East. The prevalence of PCOS is estimated to be 10% to 16% among women of reproductive age in Saudi Arabia [3]. Women with PCOS are at about three times the risk of developing type 2 diabetes, and they suffer from high rates of psychological distress, which also negatively impacts quality of life [4]. Al-

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though PCOS is quite common and a severe health challenge, it is very underdiagnosed at the global level. Many women complain of being dissatisfied with the diagnostic process and lacking education on treatment and lifestyle modifications. This delay in diagnosis delays the start of lifestyle changes, which are key components of PCOS management and are crucial to avoid long-term health effects and improve quality of life [5–7].

There are multiple factors that can result in delayed diagnosis of PCOS and suboptimal management. Symptom variation and the fact that sometimes symptoms are not present at all, cause women to visit more than one specialist (dermatologist, gynecologist, endocrinologist, mental health specialist) without a coordinating approach that takes PCOS, as a multisystem disorder, into account. Furthermore, there are physician training issues and a lack of consistency in diagnostic criteria, especially in the primary care setting, which also results in a delay of diagnosis [8].

Women with PCOS often experience gaps in information and struggle to access culturally available education resources. This is especially alarming because lifestyle modification (including weight control, diet and exercise) is the first line of treatment in the management of PCOS and should be informed, with patients engaged in treatment [9, 10].

According to a recent study [11] Saudi Arabia has one of the highest social media penetration rates in the world, with close to 79.3% of the population using some type of social media, mainly through their cell phone. Some of the most popular platforms are WhatsApp, YouTube, and Twitter/X [12]. Social media is also a shaping factor in health decision-making, as many users will inform themselves about health before they seek advice from healthcare providers [13]. These platforms provide great opportunities for health education but also raise awareness about the potential for misinformation and poor content quality, which underscores the importance of evidence-based digital interventions [14–16].

Video is a very promising digital modality for health education. Videos are more engaging, accessible to people with low literacy, and can be easily disseminated to scale compared to text-based materials [17]. The evidence indicates that video interventions can increase health knowledge, foster positive health behaviors and increase patient satisfaction especially in reproductive health settings. Telehealth and video-based education are also proven to be feasible and accepted due to the coronavirus disease of 2019 (COVID-19) pandemic [18]. Video-based tele-education could be a private and culturally appropriate way for women in conservative societies to receive health information [19, 20]. Although there is a high prevalence of the use of social media in Saudi Arabia, the literature still lacks a study on the preferences of the community for the video-based education of PCOS. However, knowing these preferences is essential in creating effective, culturally relevant interventions that reflect dominant health-seeking practices.

Since PCOS is highly prevalent in Saudi Arabia, the delays in the diagnosis are indicated, and the digitalization of health, an immediate necessity is to evaluate the current awareness and knowledge of the community towards PCOS and define the most favored forms of education to promote health based on evidence.

It is an important gap in the literature as this study fills critical gaps in PCOS awareness, level of knowledge, and educational preferences among women in Eastern Province, Saudi Arabia. The results will be used to design specific, culturally sensitive health programs based on preferred educational

methods to promote awareness of PCOS, support early diagnosis, and improve health outcomes among women in the area.

MATERIALS AND METHODS

The research will be a community-based cross-sectional study undertaken in Eastern Province in Saudi Arabia. Women who visited the shopping malls in the cities of Dammam, Khobar, and Qatif, during the period from January 2025 to March 2025, were enrolled in the current study.

The target population was the women living in the Eastern Province who had reached puberty. We sampled the community using snowball and convenience sampling techniques to recruit members through various channels (social media). A formal sample size calculation was not performed because the study was exploratory in nature, but the obtained sample size of 335 participants is sufficient to carry out statistical analyses and comparisons between groups.

The inclusion criteria encompassed female sex, residence in Dammam, Khobar, or Qatif at the time of study, ability to read and understand Arabic, and willingness to provide informed consent. The exclusion criteria included pre-pubertal females, males, and the inability to complete the questionnaire due to language barriers or cognitive impairment.

A self-administered questionnaire was developed by the research team based on the thorough analysis of the source materials on the topic of PCOS awareness, knowledge assessment, and health education preferences [9, 21]. The questionnaire was constructed in Arabic, the native language of Saudi Arabia, to be effective and culturally appropriate. The questionnaire comprised with five sections: Sociodemographic information included participants' age, height, weight (used to calculate body mass index [BMI]), marital status, educational level, level of physical activity (categorized as activity exercise, at least 75 minutes per week and moderate activity, at least 150 minutes per week), and city of residence, menstrual and gynecological history, PCOS awareness, participants' knowledge of PCOS and their preferences for education methods. In addition, preferences for video-based tele-education were evaluated using a 5-point Likert scale to determine perceived effectiveness. Responses were categorized as follows: a score of 5 indicated "highly effective," 4 indicated "very effective," 3 indicated "moderately effective," 2 indicated "mildly effective," and 1 indicated "not effective."

There were 5 content experts in women's health, public health and health education who read the questionnaire and validated it. A pilot test with 30 women was done to determine the questionnaire clarity, understanding, and time taken to complete the questionnaires. According to the pilot feedback, some minor changes were implemented to enhance the clarity of the questions and the time taken to complete the questionnaires (about 10-15 minutes). Data was collected using both paper-based (hard copy) and electronic methods in the shopping malls to maximize participation and reach diverse population groups. In parallel, an electronic version of the questionnaire was created using Google Forms and distributed through social media platforms (WhatsApp, Instagram, and X), university email lists, and community forums. Participation was anonymous, no personal identifying information was collected, and respondents were informed that the survey would take approximately 10-15 minutes to complete.

IBM SPSS (Statistical Package for the Social Sciences) Statistics version 29.0 (IBM Corporation, Armonk, NY, USA)

was used in data entry and statistical analysis. Before analysis, data were cleaned and verified as complete and no outliers and errors of entries. The lack of data was also insignificant, as the field validations required in the digital questionnaire were established, and paper questionnaires were reviewed thoroughly. Descriptive statistics: Continuous variables (age, knowledge scores) were characterized by means, standard deviations, medians, and ranges. Continuous variables were examined to assess normality using the Shapiro-Wilk test. The frequencies and percentages were used to describe categorical variables (marital status, education level, physical activity, menstrual regularity, PCOS diagnosis history based on women's statements, awareness, information sources, and educational preferences). Inferential statistics: Since the scores of PCOS knowledge are non-normal (Shapiro-Wilk $W=0.971$, $P\text{-value} < 0.001$), the non-parametric tests were used. To determine the differences in PCOS knowledge scores among age groups and educational levels, the Kruskal-Wallis H test was used. Effect sizes were determined based on epsilon-squared (ϵ^2), and $\epsilon^2 = 0.01$ represents a small effect, $\epsilon^2 = 0.06$ represents a medium effect, and $\epsilon^2 = 0.14$ represents a large effect. There were no post-hoc pairwise comparisons because the study was done in an exploratory fashion and the main interest was in the overall differences between the groups. All analyses were to have a statistical significance of $P\text{-value} < 0.05$. Tables and narrative descriptions have been used to present the results, making them easy to understand and interpret.

RESULTS

The number of women taking part in the study was 335, and they were incorporated in the ultimate analysis. Most participants were aged 18-24 years ($n=142$, 42.4%). More than half of the participants were married ($n=184$, 54.9%). Most respondents held a bachelor's degree ($n=198$, 59.1%). Almost half of the participants (46.9%, $n=157$) had moderate levels of physical activity. Most subjects reported regular menstrual cycles (72.8%, $n=244$). Almost one quarter (23.3%, $n=78$) had been previously diagnosed with PCOS (Table 1).

The key sources of information were varied among those participants who were informed of PCOS ($n=279$). Social media/internet/TV: 38.8% ($n=130$) referred to digital and broadcast media as the primary source of information, the most substantial single category. Family/friends: 26.3% ($n=88$) got PCOS information via personal networks. Healthcare providers: As the main source of information, only 21.2% ($n=71$) reported this. Awareness campaigns: 8.1% ($n=27$) were aware of PCOS due to health department campaigns. Other sources: 5.7% ($n=19$) mentioned newspapers, conferences, workshops or other sources. It is also interesting to note that healthcare providers were placed third as a source of information, after social media/internet and family/friends. When asked about the preferred modalities of receiving health information, the participants showed clear preferences regarding the preferred forms of education: Video through the internet: 57.9% ($n=194$) preferred to use video through the internet as a method of education, making it the overwhelming majority choice. Brochure/book: 16.7% ($n=56$) liked printed teaching material. Lecture: 13.4% ($n=45$), these had a preference towards traditional lectures. Other approaches: 11.9% ($n=40$) preferred using other educational approaches. Education based on videos was rated by 78.5% participants (4 and 5 in one) as effective or very effective, which is a solid argument in favor of this method of education (Table 2).

Table 1. Sociodemographic features of the study population. PCOS: Polycystic ovary syndrome.

Variable	Category	Count	%
Age	18-24	142	42.4
	25-34	79	23.6
	35-44	56	16.7
	45-54	47	14.0
	More than 55	11	3.3
Marital status	Married	184	54.9
	Single	136	40.6
	Divorced	12	3.6
	Widow	3	0.9
Education level	Middle school	40	11.9
	High school	80	23.9
	Bachelor	198	59.1
	Postgraduate	17	5.1
Physical activity	Active exercise	76	22.7
	Moderate activity	157	46.9
	Little exercise	102	30.4
Menstrual cycle regularity	Regular	244	72.8
	Irregular	91	27.2
Have PCOS diagnosis	Yes	78	23.3
	No	257	76.7

Table 2. Participants' awareness and preferred methods of learning about polycystic ovary syndrome (PCOS).

Category	Count	%
Source of information about PCOS		
Family/friends	88	26.3
Media/social media/internet/TV/etc	130	38.8
Others(Newspaper/Conference/Workshop etc.)	19	5.7
Health care providers	71	21.2
Awareness Campaign	27	8.1
Which methods are preferred by participants to get information?		
Video on the internet	194	57.9
Brochure/book	56	16.7
Lecture	45	13.4
Others	40	11.9
Rate the video strategy		
5 (Highly effective)	202	60.3
3 (Moderately effective)	47	14.0
4 (Very effective)	61	18.2
2 (Mildly effective)	12	3.6
1 (Not effective)	13	3.9

Table 3 presents that participants' knowledge about PCOS has a mean score of 13.1, with a median of 13, indicating moderate understanding. The standard deviation of 5.02 reflects variability in knowledge levels. Scores range from 5 to 26, showing a broad range of knowledge among the 335 participants.

Table 4 reveals the following:

1. Participants' knowledge per age group:

$$\chi^2 = 24.9, df = 4, p < 0.001, \epsilon^2 = 0.0746$$

The P-value (0.001) indicates significant differences in

Table 3. Participants' knowledge about polycystic ovary syndrome (PCOS)*.

Participants Knowledge	
N	335
Missing	0
Mean	13.1
Median	13
Standard deviation	5.02
Minimum	5
Maximum	26
Shapiro-Wilk W	0.971
Shapiro-Wilk p	<0.001

* The Shapiro-Wilk test ** Correlation is significant at the P-value < 0.05.

participants' knowledge across age groups. The effect size ($\epsilon^2 = 0.0746$) suggests a moderate impact of age on knowledge variation. Therefore, age plays a meaningful role in determining knowledge levels about PCOS.

2. Participants' knowledge per education level:

$\chi^2 = 8.03$, $df = 3$, $p = 0.045$, $\epsilon^2 = 0.0240$

The P-value of 0.045 indicates a significant difference in knowledge levels based on education levels. The smaller

Table 4. Comparison of participants' knowledge among age and education level groups*.

Kruskal–Wallis test		χ^2	df	P-value	ε^2
Participants’ knowledge per age		24.9	4	0.001	0.0746
Participants’ knowledge of education levels		8.03	3	0.045	0.0240
Pairwise comparisons - participants’ knowledge per age groups					
			W	P-value	
18–24	More than 55		-5.311	0.002	
18–24	35–44		-5.418	0.001	
18–24	25–34		-2.250	0.503	
18–24	45–54		-1.849	0.687	
More than 55	35–44		3.468	0.102	
More than 55	25–34		4.301	0.020	
More than 55	45–54		3.857	0.050	
35–44	25–34		2.718	0.306	
35–44	45–54		2.181	0.535	
25–34	45–54		-0.100	1.000	
Pairwise comparisons - participants’ knowledge per education level					
Bachelor	Postgraduate Studies		-3.514	0.062	
Bachelor	Student		-0.699	0.960	
Bachelor	High School		-2.306	0.362	
Postgraduate Studies	Student		2.885	0.173	
Postgraduate Studies	High School		2.286	0.369	
Student	High School		-1.077	0.872	

* The Shapiro-Wilk test ** Correlation is significant at the P-value < 0.05.

effect size ($\epsilon^2 = 0.0240$) suggests that, while education level does influence knowledge, the effect is relatively small.

Table 5 shows that participants aged 18-24 had the highest median knowledge score (14.5), while those over 55 had the lowest (7), indicating a decline in knowledge with age. Participants holding bachelor's degrees had the mean knowledge score representing the highest score (13.5), followed by middle school (13.0) and high school graduates (13.0). Suggestively, postgraduate-educated people scored the lowest in median knowledge (9).

DISCUSSION

The high level of awareness of women with PCOS in the Eastern Province of Saudi Arabia (83.3%) that was found in our study suggests that PCOS is well recognized in this population. This awareness is higher than several international studies that reported awareness at this level and is similar to the results from urban populations in the Middle East, where reproductive health education and social media exposure are relatively high [22].

Although this is a positive level of awareness, overall knowledge remained moderate, with a mean score of 13.1 out of 26 (50.4%). These findings reveal a substantial gap between awareness and detailed knowledge as women know what PCOS means, but do not have a detailed understanding of PCOS symptoms, risk factors, PCOS complications and the way PCOS can be managed. Such inconsistencies have also been reported in other regional and/or global studies. Alessa et al., 2017, Saudi Arabia: Reported that 56.7% of Saudi women knew about PCOS and information obtained from the internet, which was the most common source of information, while detailed information about the condition, causes, and complications was limited [23].

Table 5. Participants' knowledge among age and education level groups.

		Age	Participants Knowledge
N	18-24		142
	25-34		79
	35-44		56
	45-54		47
	More than 55		11
Median	18-24		14.5
	25-34		13.0
	35-44		12.0
	45-54		13.0
	More than 55		7.0
		Level of education	
N	Bachelor		198
	Postgraduate studies		17
	Middle school student		40
	High school		80
Median	Bachelor		13.5
	Postgraduate studies		9.0
	Middle school student		13.0
	High school		13.0

Awareness can start information seeking, but accurate knowledge is crucial for identifying symptoms, seeking healthcare on time and managing oneself well. The lack of knowledge can be a factor in delayed diagnosis, which is a common complaint of those with PCOS, and frequently includes a long diagnostic period and multiple health system visits. These delays have been linked to poor patient satisfaction, and it may impact patient health. Human reproduction (2021), Fernandez et al., ("Diagnosis delayed: health profile differences between women with and without PCOS diagnoses"): Demonstrates that despite symptoms, the majority of women with PCOS are not diagnosed until later in life, and when diagnosed, women often have significant fertility issues and need medical intervention, suggesting that late diagnosis may have adverse reproductive consequences [24].

The predominance of information sources could account for some of the knowledge gaps. The top sources for PCOS information were social media and the internet (38.8%), followed by healthcare providers (21.2%). It is also noteworthy that healthcare providers ranked third as a source of information, behind social media/internet and family/friends, which may reflect the minimal use of information healthcare professionals provided by when seeking information on reproduction. Digital platforms offer greater access but also have problems with misinformation, and evidence-based materials are lacking [25]. Research in Saudi Arabia and other Middle Eastern countries has noted that social media use for health information is very common, but most users of social media do not possess the capabilities of digital health literacy to critically assess the quality of the information [11].

The results indicated significantly higher knowledge levels among younger women, possibly due to greater digital engagement and familiarity with online health resources. This has been found in regional studies time and time again [11]. However, the low knowledge score for women aged more than 35 years highlights the importance of targeted education for women of this age, as this may be a time when metabolic and psychological complications of PCOS can continue.

There was no linear association between education level and knowledge of PCOS. The knowledge scores were highest among bachelor's degree holders but lower among postgraduate holders, possibly due to a low number of participants and apparently non-health-related backgrounds. Non-significant differences between each educational level indicate that general education is not enough, emphasizing the need for condition-specific health education programs. One interesting finding is that video-based education is preferred by many participants, and almost everyone considers it highly effective. Video-based learning helps to process information in multiple ways, improves retention, and facilitates self-directed learning [17]. Additionally, it provides privacy and cultural sensitivity, which are salient for reproductive health issues in conservative environments [20].

The results are aligned with the use of evidence-based digital education in the health sector. Healthcare professionals should create culturally relevant video materials about PCOS in Arabic, which can be accessed in popular platforms like YouTube and Instagram. During consultations, healthcare providers are encouraged to actively recommend them as a tool to support clinical counselling. The approaches are in line with the Saudi Vision 2030 concepts that focus on digital health transformation and health promotion [26].

There are certain limitations of the current study. Convenience and snowball sampling may be biased, as they lead

to disproportionate representation of urban, educated, digitally active women (59.1% hold a bachelor's degree), which may not be representative of the general Saudi female population. This rules out the use of the results in rural areas, among less educated or aged women in Eastern Province or Saudi Arabia. Self-selection likely resulted in the selection of health-conscious subjects. Cross-sectional design: It provides a snapshot view of knowledge and preferences without the ability to make causality or temporal changes. To determine whether education or video preferences drive engagement, longitudinal or interventional research is needed. Knowledge assessment instrument: The questionnaire, developed based on literature and professional feedback, has not been formally validated (e.g., test-retest reliability). The dichotomous scoring method ignores incomplete knowledge or false perceptions, and scores could be indicative of recall bias or guesswork; and their relationship to behaviors/outcomes is unclear. Self-reported: Liable to social desirability bias, recall or reporting bias; e.g., overestimated knowledge, or unconfirmed diagnosis of PCOS (23.3% prevalence), risk of false positives. Inadequate SoEPs: Tested video instead of other opportunities and a lack of detail about video, including length, style (animation/live), platforms, content, etc., which can be used to tailor the intervention.

CONCLUSION

In this cross-sectional study of 335 women in the Eastern Province of Saudi Arabia, PCOS awareness was high, but overall knowledge was moderate with significant differences among older women and less educated women. Healthcare providers were not the most common source of information about PCOS, with social media and internet channels being the most common, suggesting contemporary health information-seeking behaviors, and concerns were raised regarding the quality of information. The preference for video-based learning and high perceived effectiveness suggests that culturally appropriate, evidence-based video-based tele-education could be a useful and scalable way to enhance education about PCOS, facilitate informed health decision making, and encourage early symptom recognition and treatment seeking. Randomized controlled trials comparing the effectiveness of video-based PCOS education on knowledge scores, health behaviors, and clinical outcomes are needed to further study the impact of such an intervention, and to compare it to other forms of education.

ETHICAL DECLARATIONS

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Ethics Approval and Consent to Participate

The research was done in compliance with the Declaration of Helsinki principles and was ethically approved by the Institutional Review Board (IRB) of Mohammed Al-Mana College of Medical Sciences, Dammam, Saudi Arabia (IRB Approval Number: SR/RP/202). Informed consent was obtained from every participant in the study.

Consent for Publication

Not applicable.

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Availability of Data and Material

Data generated during this study are available from the corresponding author upon reasonable request.

Use of Artificial Intelligence

The authors used artificial intelligence for minor language editing; all scientific content and interpretation were done by the author.

Competing Interests

The authors declare that there is no conflict of interest.

Authors' Contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work. The authors have read and approved the final version of the manuscript.

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