

# Do Health Literacy and Awareness of Polycystic Ovary Syndrome Predict the Lifestyle Choices of Arabic-Speaking Female University Students

## Abstract

**Background:** Considering the increasing prevalence of Polycystic Ovarian Syndrome (PCOS) and its related complications—such as obesity, cardiovascular diseases, and infertility—in the Middle East, it is imperative to create sufficient public awareness about this issue. Accordingly, the potential link between PCOS awareness and health literacy level with the lifestyle choices of Arabic-speaking female university students was examined in this cross-sectional study. **Materials and Methods:** This research was conducted in the Sultanate of Oman and involved 446 Arabic-speaking female university students, who completed a self-administered online questionnaire, Single Item Literacy Screener, and PCOS Awareness Tool. **Results:** The findings showed that, while 53.50% of the study participants had inadequate health literacy, 79.80% demonstrated an acceptable level of PCOS awareness. However, this did not seem to influence their lifestyle, given that 59.20% of the respondents were physically inactive and 83.30% regularly consumed fast food. Regression analysis results nonetheless revealed that health literacy and PCOS awareness were significant predictors of lifestyle choices ( $F_{2,44} = 5.98, p < 0.05, 95\% \text{ CI } [4.44-5.35]$ ). **Conclusions:** The Arabic-speaking female university students' health literacy level and PCOS awareness are significant predictors of their lifestyle choices. Thus, the policymakers in the Arab region need to develop effective strategies aimed at PCOS prevention, focusing specifically on raising public awareness about PCOS and its negative consequences on female reproductive health. In addition, university administrators should ensure the availability of healthy food choices at their campuses as well as opportunities for physical activity to promote healthy lifestyle among all students.

**Keywords:** Awareness, health behavior, health literacy, polycystic ovarian syndrome

## Introduction

Polycystic Ovary Syndrome (PCOS) is an endocrine disorder that predominantly affects women aged from 12 to 45 years.<sup>[1]</sup> Globally, the prevalence of PCOS in this population varies between 8% and 21% depending on the ethnic group and the diagnostic criteria applied.<sup>[1,2]</sup> In the last three decades, the PCOS prevalence in the Middle East increased by 37.90%.<sup>[3,4]</sup> Therefore, as PCOS is becoming a serious public health concern in this region, urgent action is required to mitigate the implications of this condition for women's reproductive, metabolic, and psychological health. An ample body of evidence indicates that women suffering from PCOS have a higher risk of developing significant health issues, such as type 2 diabetes, high blood pressure, dyslipidemia, cardiovascular diseases, and uterine cancer.<sup>[5]</sup> In the Middle Eastern countries, cardiovascular diseases

are already the leading cause of mortality for women. Thus, conditions such as PCOS will only exacerbate the already challenging situation.<sup>[6]</sup> Further, published data shows that over 50% of the women living with PCOS seek treatment for infertility<sup>[7]</sup> and exhibit anxiety symptoms,<sup>[8]</sup> while in 27.3% of those cases this condition leads to depression.<sup>[8]</sup> At the societal level, PCOS has just as devastating consequences, given that it causes a substantial economic burden on the healthcare system, as treatment for infertility and the management of other metabolic symptoms is costly.<sup>[9]</sup> The results of a recent review conducted by Riestenberg and colleagues indicate that, globally, around 7.9 billion USD is spent each year on treating PCOS and its related complications.<sup>[9]</sup> To mitigate this growing issue, focus is increasingly given to preventive measures such as lifestyle modifications—in the form of diet changes,

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exercise, and weight reduction—particularly in patients with excess body weight. This approach is guided by a growing body of evidence linking obesity and unhealthy lifestyle behaviors (such as consumption of fast food, sugar-containing drinks, and physical inactivity) with the worsening of PCOS symptoms and the development of its related complications.<sup>[5,10-12]</sup> According to the systematic review and meta-analysis conducted by Okati-Aliabad and colleagues, obesity (21.17%) and overweight status (33.14%) are highly prevalent among women in the Middle East, suggesting that lifestyle modifications would be recommended in this context.<sup>[13]</sup> Given that Al-Ruthia *et al.*<sup>[14]</sup> found that obese women were 10% less likely to have a high level of health literacy than those of normal weight, strategies aimed at improving health literacy among these women may have a beneficial effect on their body weight and may eventually lead to a better quality of life. In the Middle Eastern countries, low levels of awareness about PCOS are also likely to contribute to its prevalence, given that 14.30% was reported in the United Arab Emirates<sup>[15]</sup> while in Oman this figure is even lower (11%).<sup>[16]</sup> As many issues related to female reproductive health, including PCOS, remain undiagnosed and untreated, it is essential to improve awareness among women in this region.<sup>[15]</sup>

However, this might be challenging, given that in conservative societies, especially in Arabic countries, women are reluctant to discuss reproductive issues—such as irregular menstruation, excessive body hair, or low libido—with their family members and friends, but also with health professionals. Therefore, given the magnitude and implications of PCOS, alternative strategies are needed to improve PCOS awareness among young women to ensure timely detection and treatment. As thus far PCOS awareness has mostly been evaluated in Western countries, employing narrow inclusion criteria or homogenous samples (such as those including only women already diagnosed with PCOS), further research is needed to examine this issue in the Middle East.<sup>[14,15,17,18]</sup> At present, the health literacy, lifestyle choices, and PCOS awareness (as well as their inter-relationships) among Arabic-speaking females remain unknown. This gap in extant knowledge has motivated the present study, as a part of which the capacity for health literacy and PCOS awareness to serve as significant predictors of lifestyle choices among Arabic-speaking female university students was evaluated. For this purpose, the data on lifestyle choices, PCOS awareness, and health literacy level were gathered from the study participants. The findings yielded by analyzing this information may inform policymakers in the Middle East, allowing them to design effective and culturally sensitive educational programs to curb PCOS and its serious sequelae.

## Materials and Methods

This cross-sectional study was conducted between March 15, 2022 and April 15, 2022 and involved 446

Arabic-speaking female university students attending major governmental and private universities in Sultanate of Oman, such as Sultan Qaboos University (SQU), Sohar University, Nizwa University, Al Buraimi University, and the University of Technology and Applied Sciences. As these universities mostly attract Arabic-speaking individuals who come from various regions of Oman, Gulf countries, and other Middle East countries, they provide an ideal setting for the current study.

The participants for this research were recruited using a convenience sampling technique. Only Arabic-speaking (i.e., capable of reading and writing in the Arabic language) female students enrolled at one of the listed universities aged between 18 and 25 years old were eligible for participation. As participation was voluntary, those that were not willing to participate were excluded, as were female students with psychological illness or inadequate Arabic language proficiency. Based on Slovin's formula,<sup>[19]</sup> 385 participants were sufficient to achieve the 95% confidence level, 5% margin of error, and 80% power, considering that the accessible population is equivalent to 10,000 female university students. Based on the anticipated 20% attrition rate, the minimum sample size was set at 405.

Following the ethical approval of the study, the recruitment process was coordinated with the aforementioned universities through Dean's office of the College of Nursing (CON) at SQU, where the study authors are working. Official letters were sent from the CON Dean's office to the administration offices of the other universities to obtain permission for data collection from the potential participants. Universities that granted permission for data collection were asked to share a list of the email addresses of all Arabic-speaking female students that were enrolled at their institution during the study period. Potential study participants were subsequently approached through their university email accounts, inviting them to take part in the study, and providing them with an information sheet explaining the study aims as well as the nature of their involvement. Participants who expressed their willingness to take part in this study were contacted by email by the study author and were provided an online link to the study questionnaire, which was uploaded to Google Forms in the Arabic language. Study participants were asked not to share the online link with their relatives or friends and each participant had the chance to submit one response. The online link was active for four weeks, that is, from March 15, 2022 to April 15, 2022. At the end of the data collection period, responses from the study participants were exported from Google Forms to an Excel sheet which was later copied to the Statistical Packages for Social Sciences (SPSS), version 24, (Armonk, New York, United States). At this stage, individuals diagnosed with psychological illness were eliminated. Those that remained were asked to complete the Single Item Literacy Screener (SILS) and the PCOS awareness tool. While SILS is freely available

for non-commercial use, permission to use the PCOS awareness tool was obtained from the developers.

The main aim of the PCOS awareness tool is to measure an individual's lifestyle choices and PCOS awareness. This tool was developed by a researcher from Zayed University in the United Arab Emirates in consultation with a gynecologist, student counselor, and statistician.<sup>[15]</sup> This tool comprises 34 dichotomous and multiple-choice questions that are divided into six sections, respectively, eliciting personal information (8 items—university, academic year, age, height, weight, marital status, have children, required medical help for having children), lifestyle choices (6 items), knowledge of basic reproductive biology (2 items), knowledge of PCOS symptoms (10 items), medical history (5 items), and general knowledge (3 items). An example of a question under the Lifestyle Choices category is: “What type of physical activities do you perform every day?” As the section related to the knowledge of basic reproductive biology is not applicable to the current study, only five sections were retained from the original instrument. Initially, scores on the “Lifestyle Choices” and “Knowledge of PCOS” subscales were converted from dichotomous to Likert scale. For the “Lifestyle Choices” section, we calculated the sum of all possible points for items 1, 3, 5, and 6, which led to a score in the 3–12 range, where a higher score indicates a greater propensity for unhealthy lifestyle behaviors. For the “Knowledge of PCOS Symptoms” section, we calculated the sum of the possible points that could be awarded for items 1 and 9, resulting in a score in the 2–5 range, where a higher score implies a lower level of awareness about PCOS. The self-reported SILS tool measures an individual's reading difficulty of health-related information<sup>[20]</sup> whereby responses are provided on a 5-point Likert scale (1 = never, 2 = rarely, 3 = sometimes, 4 = often, and 5 = always), and a score above two indicates a low level of health literacy. This tool has been shown to be valid and reliable and was thus chosen to assess the level of health literacy in the present study.<sup>[20]</sup>

The SPSS software version 23 was used for data analysis.<sup>[21]</sup> To ensure the accuracy of input, the computerized data related to each research instrument was compared with the existing data. For this purpose, investigators focused on consistency and eradicated any mistakes. Frequencies and percentages were used to depict sample characteristics, prevalence, awareness, healthy choices, and health literacy. Pearson correlation and multiple regression were used to examine the relationship between participants' lifestyle choices and PCOS awareness and health literacy level. Assumptions of multiple regression were checked and amended appropriately, while statistical significance was set at  $p < 0.05$ .

### Ethical considerations

The study was approved by the Ethics Committee of the College of Nursing at Sultan Qaboos University (CON/GP/2022/8) and written informed consent was obtained from all participants. All study procedures were

performed in accordance with the Helsinki Declaration of 1975, as revised in 2000.

## Results

### Participants' demographic characteristic

All individuals that were initially recruited for the study completed all data collection instruments, resulting in a sample size of 446. Their age was mostly in the 18–25 range (80.50%), and 34.30% of the sample weighed between 50 and 60 kg, while 33.90% weighed <50 kg, and only 12.10% of the participating students weighed more than 70 kg. In terms of the academic year, the largest percentage of respondents (23.30%) was in their fifth year, while 16.40%, 15.20%, and 15.50% were in their fourth, third, and second year, respectively. While only 13.20% of the respondents were married, 44.40% of this group did not have children and 3.10% required some medical intervention to conceive [Table 1].

### Participants' lifestyle choices

Almost all of the study participants (99.60%) were nonsmokers and 59.20% of the sample reported dedicating five hours or less per week to physical activity, while 13.70% were not doing any physical activity, and only 20.90% reported exercising for 5–10 hours on a weekly basis. When asked about their favorite physical activity, 32.30% of the respondents chose walking or jogging. In addition, 83.30% of the sample reported consuming fast food less than five times per week, while the remaining 14.30% and 1.30% indicated consumption 5–10 times and 10+ times a week, respectively. Further, 28.50% of the respondents indicated that they consume one to three soft drinks per week and only 0.20% consumed more than six soft drinks in an average week [Table 2].

### Participants' awareness of PCOS

When responding to the questions regarding PCOS, 79.80% of the participants indicated that they have heard about this condition. They next responded to a series of questions pertaining to their prior experience of the major PCOS symptoms such as irregular menstrual bleeding (absent/excessive), acne, excessive hair growth, and thick dark patches on the skin. While four choices—“always,” “many times,” “few times,” and “never”—were used in the instrument, before the analyses, we grouped the student responses under “always” and “many times” together. Specifically, 59.90% of the students reported having abnormal menstrual bleeding, 54.10% indicated prior experience of excessive hair growth, 45.80% indicated having oily skin with acne, and 69.70% reported having dark and thick skin patches. Moreover, 17.90% of the sample reported having a PCOS diagnosis and 54.40% acknowledged knowing a family member or a friend with signs of PCOS. Further, 70.20% of the participants reported having normal menstrual period, but

**Table 1: Demographic Characteristics of the Study Participants**

Item	n=446, n* (%)
1. University	
Sultan Qaboos University	342 (54.50%)
University of Technology and Applied Sciences	85 (19.10%)
Sohar university	23 (5.20%)
Nizwa University	25 (5.60%)
Al Buraimi University	70 (15.70%)
2. Academic Year	
1 <sup>st</sup> year	60 (13.50%)
2 <sup>nd</sup> year	69 (15.50%)
3 <sup>rd</sup> year	68 (15.20%)
4 <sup>th</sup> year	73 (16.40%)
5 <sup>th</sup> year	104 (23.30%)
Higher than 5 <sup>th</sup> year	72 (16.10%)
3. Age	
Below 18 years	41 (9.20%)
18–21 years	168 (37.70%)
22–25 years	191 (42.80%)
Above 25 years	46 (10.30%)
4. Weight	
<50 kg	151 (33.90%)
50–60 kg	153 (34.30%)
60–70 kg	88 (19.70%)
>70 kg	54 (12.10%)
5. Married	
Yes	59 (13.20%)
No	387 (86.80%)
6. Has Children	
Yes	39 (8.70%)
No	198 (44.40%)
Not applicable	209 (46.90%)
7. Requires medical help for having children	
Yes	14 (3.10%)
No	145 (32.50%)
Not applicable	287 (64.30%)

\*Descriptive Statistics (frequency and percentage)

23.30% indicated having poly-menorrhea (menstrual period duration of 22 days or less) and 6.50% reported having oligo-menorrhea (menstrual period length >40 days). Moreover, 22.60% of the surveyed students stated that they had undergone hormone level tests and a further 28.90% reported having had an ultrasound investigation of their uterus or ovaries. Among those who had their hormones tested, 15.90% reported elevated androgen levels [Table 3]. Only 4.70% of the 446 participants involved in this study reported taking medications to treat PCOS, and 97.80% believed that it is important for girls to be aware of PCOS. Moreover, 59.40% indicated their preference of receiving more information about PCOS from health care providers,

**Table 2: Lifestyle Choices of the Study Participants**

Item	n=446 n* (%)
1. Smoker	
Yes	2 (0.40%)
No	444 (99.60%)
2. Type of physical activity performed daily	
Walking/jogging	144 (32.30%)
Cycling	4 (0.90%)
Housework/washing	48 (10.80%)
Dancing	14 (3.10%)
Shopping	13 (2.90%)
Other	162 (36.30%)
Does not exercise	61 (13.70%)
3. Time spent on different physical activities each week	
Not applicable	69 (15.50%)
<5 h per week	264 (59.20%)
5–10 h every week	93 (20.90%)
>10 h every week	20 (4.50%)
4. Types of preferred fast food	
French fries/wedges/crisps	29 (6.50%)
Burgers/sandwiches/subs	84 (18.80%)
Pizza	22 (4.90%)
Fried chicken	4 (0.90%)
Doughnuts, pastries, cakes	10 (2.20%)
Most of the fast food	297 (33.40%)
5. Frequency of fast food consumption in a typical week	
1–5 times a week	376 (83.30%)
5–10 times a week	64 (14.30%)
>10 times a week	6 (1.30%)
6. Typical consumption of soft drinks per week	
None	315 (70.60%)
1–3	127 (28.50%)
4–6	3 (0.70%)
>6	1 (0.20%)

Note. \*Descriptive Statistics (frequency and percentage)

while 25.60% preferred finding relevant information on the Internet [Table 3].

### Participants' health literacy

As only 17.90% of the study participants reported that they never ask help with reading and interpreting health-related information, the health literacy level among the female students included in this study was evidently low [Table 4].

### Relationship between participants' lifestyle choices and their PCOS awareness and health literacy level

The regression analysis results revealed that the overall model fit was  $R^2 = 0.162$ , indicating that 16.20% of the total variation in the lifestyle choices was explained by students'

**Table 3: Participants' Polycystic Ovary Syndrome (PCOS) Awareness**

Item	PCOS	n=446, n* (%)
1. Heard about PCOS		
Yes		356 (79.80%)
Not sure		45 (10.10%)
No		45 (10.10%)
2. Length of menstrual period		
<22 days		104 (23.30%)
Between 22 and 40 days		313 (70.20%)
More than 40 days		29 (6.50%)
3. Diagnosed with PCOS		
Yes		80 (17.90%)
No		366 (82.10%)
4. Has absent bleeding/excess bleeding		
Always		267 (59.90%)
Many times		58 (13.00%)
Few times		90 (20.20%)
Never		31 (7.0%)
5. Has excess hair growth on the face, chest, abdomen, and/or upper thighs		
Always		180 (40.40%)
Many times		61 (13.70%)
Few times		108 (24.20%)
Never		97 (21.70%)
6. Suffers from oily skin and pimples		
Always		90 (20.20%)
Many times		114 (25.60%)
Few times		122 (27.40%)
Never		120 (26.90%)
7. Has patches of thick dark skin		
Always		266 (59.60%)
Many times		45 (10.10%)
Few times		96 (21.50%)
Never		39 (8.70%)
8. Knows family member or a friend with PCOS signs		
Yes		244 (54.70%)
No		202 (45.30%)
9. Aware that diet, exercise, and medication can treat PCOS		
Yes		336 (75.30%)
No		110 (24.70%)
10. Had a hormone test in the past		
Yes		101 (22.60%)
No		323 (72.40%)

**Table 3: Contd...**

Medical History	
11. Had high androgen levels in blood in the past	
Yes	71 (15.90%)
No	341 (76.50%)
12. Had an ultrasound scan of the uterus or ovaries in the past	
Yes	129 (28.90%)
No	307 (68.80%)
Not sure	10 (2.20%)
13. Taking medications for high blood sugar	
Yes	19 (4.30%)
No	427 (95.70%)
13. Has a family member diagnosed with high blood sugar/diabetes	
Yes	326 (73.10%)
No	120 (26.90%)
15. Currently taking any medications for PCOS	
Yes	21 (4.70%)
No	425 (95.30%)
General	
16. Do you think it is important for girls of your age to know more about this disease?	
Yes	436 (97.80%)
No	8 (1.80%)
Not sure	2 (0.40%)
17. From what source would you prefer to get more information about Polycystic Ovary Syndrome (PCOS)?	
School/teachers	31 (7.00%)
Health center/Health professionals (doctor, nurse, pharmacist)	265 (59.40%)
Internet/self-directed research	114 (25.60%)
Media (television/radio/newspapers)	36 (8.10%)

\*Descriptive Statistics (frequency and percentage)

health literacy level ( $\beta_1 = 0.12, p < 0.05$ ) and PCOS awareness of ( $\beta_2 = 0.11, p < 0.05$ ). Although the overall relationship was significant—( $F_{2,44} = 5.98, p < 0.05, 95\%$  CI [4.44–5.35])—further analysis was performed using stepwise regression to exclude non-significant variables. The obtained findings provided two significant models of specific predictors (i.e., health literacy level and awareness of PCOS) with the  $R^2$  value in the 0.12–0.16 range [Table 5]. This finding shows that health literacy level and PCOS awareness significantly predict the lifestyle choices of study participants.

## Discussion

This prospective study was conducted to assess the PCOS awareness, health literacy, and lifestyle choices among 446 Arabic-speaking female university students of reproductive age from the Sultanate of Oman. Given that

Contd...

79.80% of the study participants have heard about PCOS, this finding concurs with the results reported by Shenoy and Brundha<sup>[22]</sup> and Tahir and colleagues.<sup>[23]</sup> In contrast, in the United Arab Emirates, a lower level of awareness about PCOS was noted by Pramodh.<sup>[15]</sup> Relatively high PCOS awareness among our study participants could be attributed to the fact that 54.70% of the sample knew family members with PCOS symptoms and about 17.90% of these female students were already diagnosed with PCOS. Similarly, Pramodh<sup>[15]</sup> found that 14.30% of Emirati female students have PCOS, while a much lower rate was reported for Pakistan and Spain.<sup>[24,25]</sup> PCOS is linked to the presence of key symptoms such as irregular menstrual cycles (absent or excessive bleeding), excessive hair growth (on the face, chest, abdomen, upper thighs), oily skin and acne, patches of thick dark skin, and large ovaries (exceeding 5 cm in length). In our study, 72.90% of the subjects reported frequently experiencing absent or excessive menstrual bleeding, 54.10% reported experiencing excessive hair growth, 45.80% reported having oily skin with acne, and 69.70% indicated having thick and dark skin patches. These findings are consistent with the percentages reported by the female participants in studies conducted in UAE, Qatar, and Iran.<sup>[15,26,27]</sup> However, in our study, higher incidence of poly-menorrhoea (23.30%) compared to oligo-menorrhoea (6.50%) was noted, countering the findings reported for UAE.<sup>[28]</sup> Overall,

the results yielded by this study strengthen the validity of the prevalent view that PCOS is diagnosed based on self-reported symptoms by patients and is rarely clinically tested. It is also worth noting that unhealthy behaviors, such as frequent consumption of fast food and sedentary lifestyle, exacerbate most metabolic diseases, including PCOS. While only 0.40% of the study participants reported smoking, 13.70% of our sample did not engage in any type of physical activity while a further 59.2% dedicated fewer than five hours per week to physical and recreational activities. These findings are in accordance with those reported for other Gulf countries, such as Saudi Arabia, UAE, and Qatar, where 58%, 62%, and 65% of the surveyed female students, respectively, indicated that they were not sufficiently physically active.<sup>[15,29,30]</sup> Among the study participants that were physically active, walking and jogging were preferred activities, whereas female students in Qatar favored walking and going to the gym.<sup>[30]</sup> The majority of our study participants also reported consuming fast food on a weekly basis, with 14.30% and 83.30% of the sample selecting 1–5 and 5–10 times per week as their response, respectively, concurring with 12% and 85% reported for Emirati students,<sup>[15]</sup> while being below the percentages noted in Bahrain and Saudi Arabia.<sup>[31,32]</sup> As 30.40% of the surveyed students stated that they consume at least one soft drink per week, this is an alarming finding, indicating that the policymakers in the Ministry of Higher Education and the Ministry of Health need to identify effective strategies to promote healthy behaviors among female university students. Still, it is encouraging to note that 97.80% of the study participants agreed that awareness about PCOS is very important for girls and women of reproductive age. As half of the surveyed female students prefer to receive health information from their healthcare providers, this should prompt the medical professionals in the primary care setting to start routinely discussing PCOS with female patients. This is highly relevant, given that 53.50% of the participants had a low level of literacy, indicating that they may need assistance with interpreting relevant information. As Al-Ruthia *et al.*<sup>[14]</sup> who also utilized the SILS reported a much higher health literacy

**Table 4: Health Literacy of the Study Participants**

Item	n=446, n*(%)
How often do you need to ask someone for help to interpret the instructions, pamphlets, or other written materials provided by your doctor and/or pharmacist?	
• Never	80 (17.90%)
• Rarely	127 (28.50%)
• Sometimes	170 (38.10%)
• Often	55 (12.30%)
• Always	14 (3.10%)

\*Descriptive Statistics (frequency and percentage)

**Table 5: Stepwise Regression Analysis for Predictors of Lifestyle Choices**

Model*	Unstandardized Coefficients		Standardized Beta	t	95.0% Confidence Interval for B		r <sup>2</sup>	p
	β	Std. Error			Lower	Upper		
1								
Constant	5.32	0.13		40.83	5.07	5.58	0.12	<0.001
Health Literacy	0.12	0.00	0.12	2.61	0.03	0.22		0.009
2								
Constant	4.89	0.23		21.12	4.44	5.35	0.16	<0.001
Health Literacy	0.12	0.47	0.12	2.57	0.03	0.22		0.010
Awareness of Polycystic Ovary Syndrome (PCOS)	0.12	0.05	0.11	2.25	0.02	0.023		0.025

\*Multiple Regression

rate (with only 16.54% of the respondents achieving low scores), it is evident that significant improvements are required in Sultanate of Oman, given the well-established link between lifestyle choices and the health literacy level among university students.<sup>[33,34]</sup> Although several authors have failed to establish such significant relationship, improving health literacy and discouraging unhealthy lifestyle are always advantageous for public health.<sup>[35,36]</sup> Given that healthcare providers are obligated by their professional role to promote the health status of all female patients, especially minority groups like Arabic-speaking women and girls, they play a crucial role in increasing the health literacy in developing countries.<sup>[37]</sup> In particular, all staff members working in gynecology units should provide comprehensive health education to young girls and their parents about various menstrual disorders and the importance of adhering to healthy lifestyle behaviors. Motivational health education interventions should be also considered in all healthcare settings to enhance compliance with healthy behaviors, as this is expected to improve the health status of young females and decrease the negative consequences of PCOS on their reproductive life.

The findings obtained in this study are important for maternal health professionals, as they can serve as a foundation for future studies examining PCOS among Arabic-speaking female students in the Middle East. The main strengths of the work presented here stem from its prospective design, use of validated instruments, multiple study settings, and having adequate sample size, all of which support the validity of the obtained results. Nonetheless, certain study limitations are inevitable and can be addressed in future research. Specifically, as the convenience sampling technique and sole focus on female university students from one country preclude generalizability beyond the current setting, in the future, larger and more heterogeneous samples should be included to verify the findings obtained here. In addition, online self-reporting surveys may lead to non-response bias; however, they are widely used as convenient and cost-effective data collection means.

## Conclusion

The current study indicates that PCOS symptoms are highly prevalent among Arabic-speaking female students from the Sultanate of Oman. Moreover, most of the study participants exhibited a low level of health literacy and followed an unhealthy lifestyle. As health literacy level and PCOS awareness emerged as significant predictors of lifestyle choices in our analyses, it is essential that policymakers in the Ministry of Higher Education and Ministry of Health develop effective preventive strategies. This may include organizing health campaigns in the universities in Arab countries to promote awareness about PCOS and its negative consequences on female reproductive health. In addition, administrators in universities in Arab countries should ensure the availability of healthy food choices on

their campuses, which should also offer a wide range of opportunities for regular physical activity.

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## Conflicts of interest

Nothing to declare.

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