

Prevalence and Knowledge of Polycystic Ovary Syndrome (PCOS) Among Female medical Students, King Khalid University

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ABSTRACT

Background: polycystic ovary syndrome is one of the most common endocrinopathies. PCOS is hormonal complex disorder affects many women globally. The incidence of PCOS will increase due to lifestyle change. PCOS had group of symptoms irregular menstrual cycles, excessive hair growth (hirsutism), insulin resistance. This study has been conducted to assess the prevalence and Knowledge of PCOS among female medical students in King Khalid University, Abha, Saudi Arabia.

Methodology: this is cross-sectional study, online questionnaire was sent to 200 female medical students in King Khalid University, Abha, Saudi Arabia, during the period from 10/8/2022 to 10/12/2022. The study targeted all female medical students in King Khalid University.

Result: the prevalence of self-reported was 26.5%. The most clinical presentation among the participants were oligomenorrhea, hirsutism, increase weight, acne and insulin resistance. Increase in weight and irregular physical activity show a relationship with PCOS, 79.5% of participants aware of PCOS.

Conclusion: This study was conducted among female students at King Khalid University and included a total of 200 participants. The most common age group was 20-23 years. This study revealed the prevalence of PCOS is about (26.5) % which considered low. The hair loss, lower abdominal pain and acne were the significant and dominant problems among the participants and they have an adequate knowledge about PCOS and it is complication.

Keywords: polycystic ovary syndrome, King Khalid University, medical students.

INTRODUCTION

Background

polycystic ovary syndrome is the most widespread endocrine and metabolic disorder in women of childbearing age (1), (2), (3), (4), (5), (6). Studies in different populations have suggested that PCOS affects at least four of fifteen women of the reproductive age(1), the prevalence rate was (55.6% in Egypt)(2), (7.1% in Iran)(4), (20%–25% in Italy)(1), (26% in Australia), (6% in Mexico), (2.2% in Southern China), (6.6% in Greek island of lesbos)(7), (52% in India)(15), (16% in middle east)(16), Saudi studies showed the prevalence was 16%(17) and 32.5% in Madinah(18).

PCOS can be diagnose in patients presenting with at least two of three features: clinical or biologic hyper-androgenism, chronic anovulation, and polycystic ovaries on sonogram (8), clinical signs such as hirsutism and acne are considered sufficient evidence of hyper-androgenism (2), (5).

PCOS reduces fertility due to associated endocrine, metabolic and gynecological abnormalities that impact the quality and function of the ovary (2). Many studies showed strong relationship between the occurrence of PCOS and increase waist circumference (8), sedentary life, and unhealthy food habits, so lifestyle modification as healthy food and exercise play important role in the prevention of PCOS and decrease the risks of cardiovascular diseases and diabetes mellitus type 2(9), (10), (11), (12), also many studies showed that the PCOS patient most likely to develop depression, stress, anxiety and eating disorders (13,14).

Gap of literature

There is no study in south Saudi region conducted to establish the prevalence and knowledge of PCOS among medical students at King Khalid University.

Aim

The aim of this study was to assess the prevalence and knowledge of PCOS among medical students at King Khalid University. Other objectives, included exploring any associated risk factors of PCOS among medical students at King Khalid University.

METHOD

Study design

- A cross-sectional study of medical students at King Khalid University. Data was collected electronically utilizing a questionnaire divided into several sections.

Study duration

- Data collection occurred from 10/8/2022 to 10/12/2022.

Sample size estimation

- The number of female medical students at King Khalid University is 544 , this study involved 200 participants of them .

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Inclusion criteria

- Female medical students at King Khalid University and who were willing to participate.

Exclusion criteria

- Female non medical students at King Khalid University and who were not willing to participate.

Ethics

- The study was approved by The Research Ethics Committee at King Khalid University . The researchers used consent from the participants before answering the questionnaire.

Questionnaire

- The data was collected by an Arabic and a close-ended questionnaire. The questionnaire was divided into two sections; The first section was about socio-demographic characteristics (age, weight, height, marital status). The second section assessed PCOS. In this section participants was ask about the presence of signs and symptoms of PCOS, awareness about PCOS, the impact of family history, exercise, diet and stress.

Recruitment

- The participants engaged in the study was medical students at King Khalid University, participants was invited to participate in an electronic survey distributed by social media like Twitter, Telegram, and WhatsApp.

Data Analysis

- The statistical analysis was performed using SPSS (version 26). The primary outcomes was the presence of PCOS as mean with standard deviations. The chi-square test was apply to assess the association between categorical variables and the Mann–Whitney test for continuous variables. The statistical significance was set at $p \leq 0.05$.

RESULTS

1. Sociodemographic characteristic of study participants:

This study was conducted among female students at King Khalid University and included a total of 200 participants. The most common age group was 20-23 years (34%) followed by 18-20 years (31.5%). Majority of participants weighed 50-59 Kg (31.5%) and have a height of 160-164 cm (28%). More than two thirds of female students in this study were single (84.5%) (Table 1).

Table 1. Sociodemographic characteristic of study participants, King Khalid University, (N= 200).

Variable	Frequency	Percentage
University		
King Khalid university	200	100.0
Age		
18-20 years	63	31.5
21-23 years	68	34.0
24-26 years	50	25.0
27-29 years	19	9.5
Weight		
40-49 kg	36	18.0

50-59 kg	63	31.5
60-69 kg	37	18.5
70-79 kg	28	14.0
80-89 kg	15	7.5
90-99 kg	8	4.0
100-109 kg	10	5.0
110-119 kg	1	.5
120-129 kg	2	1.0
Height		
145-149 cm	13	6.5
150-154 cm	50	25.0
155-159 cm	51	25.5
160-164 cm	56	28.0
165-169 cm	24	12.0
170-174 cm	4	2.0
175-179 cm	2	1.0
Social status		
Single	169	84.5
Married	28	14.0
Divorced	3	1.5

2. Signs and symptoms of PCOS:

(71.5%) have a normal length of menstrual cycle (21-35 days), while only (23%) have an excessive hair growth on their faces and chest. More than one third (43.5%) complain of increasing in weight. A percentage of (75.5%) have hair loss. Half of participants (53.5%) have acne. (41%) have dark discoloration in neck and under arm. (7.5%) had difficulties in getting pregnant, and (7%) underwent medical intervention to get pregnant. (4%) were diabetic and (10%) prediabetic as illustrated in (Table 2).

Table 2. Signs and symptoms of PCOS among participants, King Khalid University, (N= 200).

Signs and Symptoms	Answer	Frequency	Percentage
How long is the usual duration of time between 2 periods?	Normal (21-35 days)	143	71.5
	Oligomenorrhea	46	23.0
	Menorrhagia	11	5.5
Do you have excessive hair growth on face or chest?	Yes	46	23.0
	No	154	77.0
Do you complain of increase in weight?	Yes	87	43.5
	No	113	56.5
Do you have hair loss?	Yes	151	75.5
	No	49	24.5
Do you have acne?	Yes	107	53.5
	No	93	46.5
Do you have black discoloration in the neck or under arm?	Yes	82	41.0
	No	118	59.0
If you are married, do you have difficulty in getting pregnant?	Yes	15	7.5
	No	17	8.5
If you are married, did you undergo any medical intervention to get pregnant?	Unmarried	168	84.0
	Yes	14	7.0
Do you have Diabetes Mellitus?	No	19	9.5
	Unmarried	167	83.5
Do you have Diabetes Mellitus?	Yes	8	4.0
	No	172	86.0
	Prediabetic	20	10.0

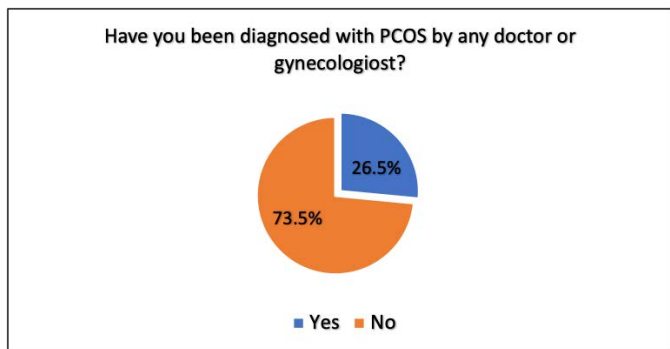


Figure 1. percentage of students who know the term “poly cystic ovary disease”, King Khalid University, (N= 200).

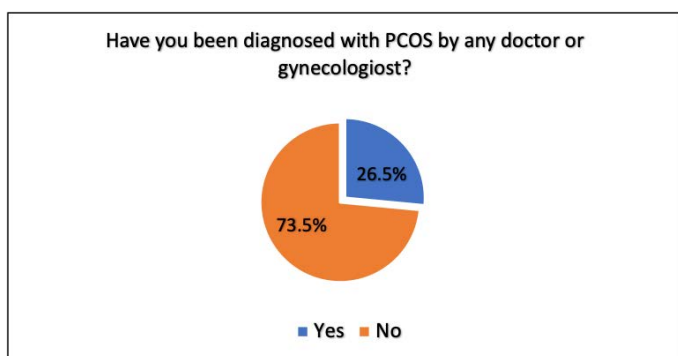


Figure 2. prevalence of PCOS among female students at King Khalid University, (N= 200).

3. Participants past history and hormonal profile:

(79.5%) know the term poly cystic ovary disease. The prevalence of PCOS was found to be (26.5%). About one third (31%) underwent ovaries examination with ultrasound. In (24.5%) ultrasound results pointed to PCOCS. (43%) did the fasting blood glucose test before, and it was normal in majority of them (34.5%). Only (12%) have drugs for diabetes. About one half of respondents (47%) have a positive family history of PCOS symptoms (Table 3).

The most common hormonal tests which participants underwent were TSH (27%), prolactin (21%), and Testosterone (20.5%). Results showed normal hormonal profile in majority of cases, but prolactin (14.7%) and testosterone (8.6%) were the most common abnormal hormones.

Table 3. Participants past history, King Khalid University, (N= 200).

Statement	Answer	Frequency	Percentage
Did you undergo ovaries examination with ultrasound	Yes	62	31.0
	No	138	69.0
If the answer was yes, did the ultrasound results pointed to PCOS?	Yes	49	24.5
	No	23	11.5
	I didn't do it	128	64.0
Did you underwent oral glucose tolerance test or fasting blood glucose test before?	Yes	86	43.0
	No	114	57.0
If the answer was yes, was it normal or abnormal?	Normal	69	34.5
	Abnormal	20	10.0
	I didn't do it	111	55.5

Do you take any drugs for diabetes?	Yes	24	12.0
	No	176	88.0
Do you have any women in your family with PCOS symptoms or above mentioned symptoms?	Yes	94	47.0
	No	106	53.0

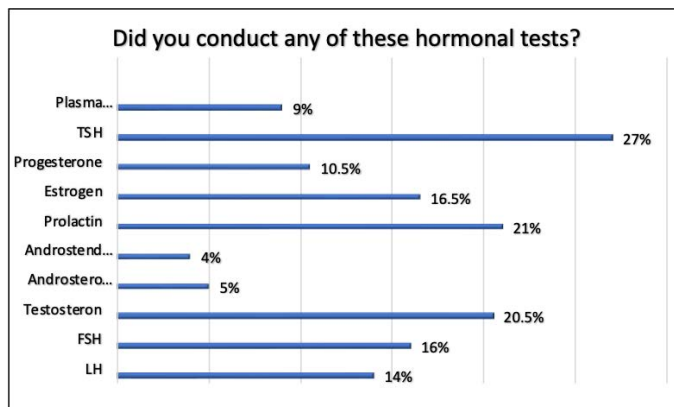


Figure 3. hormonal tests which participants did, King Khalid University.

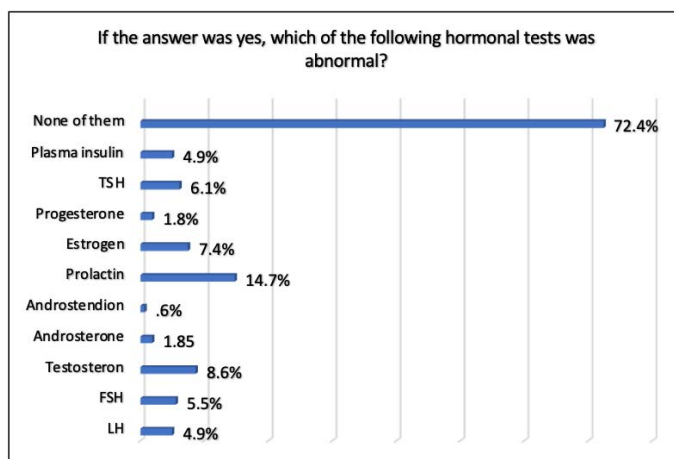


Figure 4. results of hormonal tests which participants did, King Khalid University.

4. Life style of participants:

Majority of students (35%) had a duration of physical activity of less than 5 hours per week. Walking was the most popular (66%) form of physical activity among participants. (65%) are consuming fast food less than 5 times per week, and (46%) take soft drinks 1-3 times per week.

Table 4. life style of study participants, King Khalid University, (N= 200).

Statement	Answer	Frequency	Percentage
What is the duration of your physical activity?	< 5 hours/ week	70	35.0
	5-10 hours/ week	56	28.0
	> 10hours/ week	19	9.5
	I have no physical activity	55	27.5

What is the usual physical activity that you are practice in most of the time?	Walking	132	66.0
	Running	16	8.0
	Cycling	5	2.5
	Swimming	5	2.5
	Sports club	14	7.0
	Exercise in home	48	24.0
How many times do you take fast food during the week?	I have no activities	48	24.0
	< 5 times/ week	130	65.0
	5-10 times/ week	33	16.5
	> 10 times/ week	2	1.0
How many times do you take soft drinks during the week?	I don't eat fast food	35	17.5
	1-3 times/ week	92	46.0
	3-6 times/ week	33	16.5
	> 6 times/ week	12	6.0
	I don't drink soft drinks	63	31.5

5. Knowledge about PCOS and it is complications:

(89.5%) knows that PCOS can be controlled with eating a healthy diet and exercise, a slightly lesser percentage (87.5%) knows weight loss can decrease PCOS symptoms and signs, (62.5%) knows that PCOS can leads to Diabetes, (54.5%) knows that it can leads to heart diseases and hypertension, almost all students (92%) knows PCOS makes women complain of psychological stress, and (68%) knows it can lead to breast and uterine cancer (Table 5).

Table 5. knowledge about PCOS and its complications, King Khalid University, (N= 200).

Statement	Yes		No	
	N	%	N	%
Do you think that PCOS can be controlled with eating a healthy diet and exercise?	179	89.5	21	10.5
Do you think that weight loss can decrease PCOS symptoms and signs?	175	87.5	25	12.5
Do you think PCOCS can leads to Diabetes?	125	62.5	75	37.5
Do you think that PCOS can leads to heart diseases and hypertension?	109	54.5	91	45.5
Do you think PCOS makes women complain of psychological stress?	184	92	15	7.5
Do you think that PCOS can leads to breast cancer and uterine cancer?	136	68	64	32

6. Association between PCOS signs and symptoms and prevalence of it:

Results showed that duration of the cycle is significantly associated with diagnosis of students with PCOS. Also excessive hair growth, increase in the weight, abdominal pain, black discoloration in neck and armpits, and diabetes were also associated with PCOS (P< .005) (Table 6).

Table 6. Association between PCOS signs and symptoms and prevalence of it, King Khalid University, (N= 200).

Signs and Symptoms	Answers	Have you been diagnosed with PCOS?		
		Yes	No	P value
How long is the usual duration of time between 2 periods?	Normal	21	122	< .001
	Oligomenorrhea	27	19	
	Menorrhagia	5	6	
Do you have excessive hair growth on face or breast?	Yes	26	20	< .001
	No	27	127	
Do you complain of increase in weight?	Yes	43	44	< .001
	No	10	103	
Do you have hair loss	Yes	40	111	.9
	No	13	36	
Do you have pain in the lower abdomen	Yes	47	74	< .001
	No	6	73	
Do you have acne?	Yes	33	74	.1
	No	20	73	
Do you have black discoloration in the neck or armpit?	Yes	31	51	.003
	No	22	96	
Do you have Diabetes Mellitus	Yes	4	4	< .001
	No	36	136	
	Prediabetic	13	7	

Discussion

The findings from our study showed that 26.5% of the study participants diagnosed as PCOS. In this study the level of PCOS was lower compare to Saudi study conducted among young unmarried female students of Taibah University Almadinah Almunawwarah 53.7% (19) and another Saudi study in Madinah concluded that the prevalence of PCOS is 32.5% (18), also the finding of this study was higher compare to Saudi study conducted among female students studying pharmacy at Princess Nourah University in Riyadh 16% (17) and another Saudi study conducted in Jeddah 11.70% (20).

In this study we measured the clinical presentation among the participants, most of the participants had oligomenorrhea around 23%, hirsutism around 23%, increase in weight 43.3%, acne around 53.5%, acanthosis nigricans around 41%, fertility problem around 7%, hair loss around 75.5%, also there was hormonal disturbance such as increase in prolactin around 14.7% , increase in FSH around 5.5%, LH around 4.9%, increase in estrogen around 7.4% and increase in testosterone around 8.6%, this finding is in line with another Saudi studies (17)(21).

A study done in Saudi Arabia on 100 students showed a relationship between PCOS and increase BMI, where 19.4% were overweight and 6.1% were obese, while 28% of obese and overweight had PCOS (17). Another study done in Riyadh, Saudi Arabia on 523 female found obese patients were considerably higher in PCOS group compared to controls (30.3%, 11.2%, respectively), The study showed no noticeable difference between case and control groups of PCOS in food intake but cases noted that they never had exercise in about double the controls percentage (50% and 25.7%, respectively) (23). Compare to two previous researches the results found also positive correlation between PCOS, increase the weight, and decrease the physical activity.

This study showed that (75.5%) of the respondents were aware of PCOS. The level of awareness in this study was high. A lower percentage of awareness was reported in a study conducted in Saudi Arabia by Alessa et al. (23), who found that the level of awareness of PCOS was 56.7%. Among them, 15.3% were PCOS patients, and 21.3% had known about PCOS from different sources. Ghadah Ayad Alruwaili et al. (24), conducted a study among females in Saudi Arabia and to explore the relationship between the level of awareness and different sociodemographic factors. The findings of this study indicated that most of the participants (74.8%) were recognized with a good level of awareness, whereas (25.2%) had a poor level of awareness. The level of awareness of PCOS was significantly related to educational level and marital status (24). A similar study was conducted by Samah Omar Alfahl et al. (25), among women of reproductive age in Al-Madinah Al-Munawarah city. More than half (53.1%) were aware of PCOS. So, the awareness and knowledge of PCOS are acceptable (25).

PCOS has historically been defined as a syndrome related to many complications (26). The findings of this study showed that (89.5%) of the participants have an adequate knowledge about PCOS and its complication. A highly percentage knows that PCOS complications can be controlled by modify the lifestyle. Almost all the participants knows that women with PCOS present an increased risk for psychological disorders and reduced quality of life compared to healthy women and increased prevalence of cardiovascular disease (CVD) such as hypertension, dyslipidemia, diabetes, and obesity. PCOS at any age is characterized by greater odds for elevated CVD risk markers and these elevated makers can occur without obesity but are magnified with obesity (26). Participants knows women with PCOS present an increased risk of endometrial cancer and breast cancer compared to non- PCOS healthy women.

STUDY LIMITATIONS

Despite the fact that our research met its objectives, it has several limitations. First, the sample size was small for a deep and widespread study. Second, a self-reported questionnaire served as the basis for the outcome. As a result, the questions may be misunderstood or reported with bias. Third, our questionnaire includes statements regarding participants feelings and capacity to accomplish certain tasks, which relies on the ability to recall, which some participants lack.

CONCLUSION

This study was conducted among female students at King Khalid University and included a total of 200 participants. The most common age group was 20-23 years. This study revealed the prevalence of PCOS is about (26.5) % which considered low. problems among the participants and they have an adequate knowledge about PCOS and its complication. Women with PCOS at increased risk of obstetric, cardiometabolic, oncology, and psychological complications throughout life, and it is recommended that these women be accurately assessed with periodic follow-up. Higher education about PCOS helps improve overall health status among females. Finally, PCOS not only as a reproductive age disorder but as a long- life syndrome.

Authorship Contribution: All authors share equal effort contribution towards (1) substantial contributions to conception and design, acquisition, analysis and interpretation of data; (2) drafting the article and revising it critically for important intellectual content; and (3) final approval of the manuscript version to be published. Yes

Potential Conflicts of Interest: None

Competing Interest: None

Acceptance Date: 19-12-2023

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