

## ORIGINAL RESEARCH ARTICLE

# Knowledge and attitudes towards polycystic ovary syndrome

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## Abstract

Polycystic ovary syndrome (PCOS) is a complex condition affecting about 5% to 7% of women in their reproductive years. Adequate knowledge and a right attitude play an important role in the management of the disease and in the prevention of complications. This study aimed to assess the knowledge and attitude of women towards PCOS. A questionnaire-based cross-sectional study was conducted in women aged 18-75 years old at the outpatient department of Jordan University Hospital. The questionnaire consisted of three main parts: the respondents' sociodemographic variables, knowledge of PCOS, and attitude towards PCOS. There was a total of 400 participants, data was analyzed using SPSS version 23, 89% of the 400 participants were aware of the term PCOS. Most of the participants have adequate knowledge and positive attitude towards the disease. However, most of them lack knowledge on its complications. The level of education and occupation were found to have a positive association with knowledge and attitude towards the disease. Meanwhile, marital status and age were only found to have a positive association towards knowledge. Doctors were found to be the most preferred source of knowledge for further information about PCOS. (*Afr J Reprod Health* 2022; 26[1]: 92-102).

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**Keywords:** Polycystic ovary syndrome; knowledge; attitude; complications

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## Résumé

Le syndrome des ovaires polykystiques (SOPK) est une affection complexe qui touche environ 5 % à 7 % des femmes en âge de procréer. Des connaissances adéquates et une bonne attitude jouent un rôle important dans la gestion de la maladie et dans la prévention des complications. Cette étude visait à évaluer les connaissances et l'attitude des femmes envers le SOPK. Une étude transversale basée sur un questionnaire a été menée chez des femmes âgées de 18 à 75 ans au service ambulatoire du Jordan University Hospital. Le questionnaire comprenait trois parties principales : les variables sociodémographiques des répondants, la connaissance du SOPK et l'attitude envers le SOPK. Il y avait un total de 400 participants, les données ont été analysées à l'aide de SPSS version 23, 89% des 400 participants connaissaient le terme SOPK. La plupart des participants ont des connaissances adéquates et une attitude positive envers la maladie. Cependant, la plupart d'entre eux manquent de connaissances sur ses complications. Il a été constaté que le niveau d'éducation et la profession avaient une association positive avec les connaissances et l'attitude envers la maladie. Pendant ce temps, l'état matrimonial et l'âge n'ont qu'une association positive avec la connaissance. Les médecins se sont révélés être la source de connaissances préférée pour obtenir de plus amples informations sur le SOPK. (*Afr J Reprod Health* 2022; 26[1]: 92-102).

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**Mots-clés:** Syndrome des ovaires polykystiques ; connaissance; attitude; complications

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## Introduction

Polycystic ovary syndrome (PCOS) is a highly prevalent disorder, which is estimated to affect 5-10% of women in their reproductive age<sup>1</sup>. This makes it the most common endocrine disorder in this population<sup>2</sup>. PCOS is a heterogeneous syndrome that is classically characterized by features of anovulation combined with symptoms of androgen excess<sup>3</sup>. These clinical manifestations,

when gathered, form a spectrum of a disorder with a mild presentation in some and in others a severe disturbance of reproductive, endocrine, and metabolic function<sup>4</sup>. At a joint consensus meeting of the American Society for Reproductive Medicine and the European Society of Human Reproduction and Embryology (ASRM/ESHRE), also known as the Rotterdam criteria, a refined definition of PCOS was agreed on, namely, the presence of two out of three criteria: (i) oligo- and/or anovulation, (ii)

hyperandrogenism (clinical and/or biochemical), and (iii) polycystic ovaries with the exclusion of other etiologies<sup>5</sup>.

Conversely, the Androgen Excess Society task force recognized four key features of PCOS: (1) ovulatory and menstrual dysfunction, (2) hyperandrogenemia, (3) clinical features of hyperandrogenism, and (4) polycystic ovaries<sup>6</sup>. Among patients diagnosed with PCOS, 75% have been clinically evidenced with menstrual disturbances<sup>6</sup>. Around 60-80% of PCOS patients were observed to have elevated circulating androgen levels<sup>6</sup>. The clinical features of hyperandrogenism seen clinically in PCOS patients are hirsutism, acne, and androgenic alopecia. Among these, the most common presenting complaint of PCOS patients is hirsutism followed by acne and androgenic alopecia<sup>6</sup>. Other features that are manifested in PCOS patients include the presence of polycystic ovaries: either 12 or more follicles measuring 2-9 mm in diameter or an increased ovarian volume of more than 10 cm<sup>3</sup> detected by ultrasonography<sup>7</sup>.

The problems of PCOS are not only related to cycle regulation, acne, and hirsutism, but in fact, it has also been strongly linked to dyslipidemia<sup>8</sup> and cardiovascular disease<sup>9</sup>. A 24-hour blood pressure monitoring revealed that young women with PCOS demonstrated an increase in both mean and systolic blood pressure<sup>10</sup>. Moreover, postmenopausal women who suffered from PCOS are at increased risk of developing hypertension<sup>11</sup>. In another study conducted by Legro *et al.*<sup>12</sup>, it was found that PCOS is also associated with insulin resistance, impaired glucose tolerance, and type 2 diabetes mellitus. Females suffering from PCOS are also at high risk of having obstructive sleep apnea or sleep disturbances<sup>13</sup>. The lifetime risk of endometrial cancer that has been estimated in these women is 2.7 times more than that in women without this syndrome<sup>14</sup>. The prolonged unopposed estrogen production in the endometrium from chronic anovulation is the main cause for the development of endometrial cancer. Many studies have shown that women with PCOS are facing a great deal of risks for infertility, and if they do conceive, a meta-analysis concluded that women with PCOS have increased risks of pregnancy complications such as gestational diabetes and preeclampsia with negative

effects on neonatal outcomes<sup>15</sup>. Moreover, it is also reported in a few studies that there is a significantly increased risk of depressive disorders in these women, which could partly be explained by the comorbidities and physical changes<sup>16,17</sup>. Considering all the complications of the disease, it is very important to acknowledge the great impact it has on the patients physically, psychologically, and socially. Thus, it is very crucial to diagnose PCOS early in order to reduce the incidence of undesirable complications.

Despite the serious complications developed in women with PCOS, several studies show women had poor knowledge and minimal awareness on PCOS<sup>18-20</sup>. Most women in the study population are unaware of the complications associated with this disorder<sup>18</sup>. A study conducted among adolescent girls shows that the lack of awareness and a negative lifestyle attitude towards PCOS prevent them from taking any measures to improve their lifestyle behaviors<sup>19</sup>.

Considering the importance of knowledge on and awareness of PCOS among the female population and its association with the prognosis of the disorder, assessing the knowledge level is an essential part of disease management. We were unable to find any studies in Jordan that discussed the knowledge of the general female population about PCOS; thus, our study aimed, first, to determine the level of knowledge regarding the signs and symptoms, complications, and treatments of PCOS among the Jordanian population. Second, we aimed to examine the attitude of the Jordanian population towards PCOS. Third, we intended to identify the relation between the sociodemographic aspects, including age, marital status, educational level, and occupation, and the level of knowledge and attitude towards PCOS. Finally, our study objective is to identify the source of current knowledge and the preferred source from which women might obtain further information.

## Methods

This is a cross-sectional study that was conducted at the outpatient department of Jordan University Hospital (JUH), particularly in the Family Medicine and Obstetrics and Gynecology Clinic. JUH is the biggest educational hospital in Amman, the capital

of Jordan. It provides service to patients from all over the country. The study sample consisted of 400 women aged 18-75 years old who visited the outpatient department as a patient or patient's companion from August to October 2018. They agreed to participate in the study by filling out a self-administered questionnaire. The respondents were given an explanation on the purpose of the study, and briefing was conducted with regard to the questionnaire provided. Privacy and confidentiality were ensured. The questionnaire was then reviewed by the investigator to verify if it was filled out completely.

The researchers developed a questionnaire after a comprehensive literature review. The questionnaire was translated to Arabic language and was tested for validity by question revision as conducted by two associate professors of gynecology and one full professor of community medicine. All comments were discussed and corrections were made accordingly. A pilot study of 40 questions was filled out to test for reliability, which was not included in the study. Cronbach's alpha was found to be 0.714.

The questionnaire consisted of three main parts: the respondents' sociodemographic variables, knowledge on PCOS, and attitude towards the disease. The sociodemographic variables included age, marital status, occupation, education, previous awareness about PCOS, and source of information. The second and the third part of the questionnaire were assessed using a Likert scale ranging from 1 to 5 (strongly agree, agree, undecided, disagree, and strongly disagree).

The second part of the questionnaire consisted of 15 knowledge questions: 5 questions regarding the diagnosis of PCOS (multiple cysts in ovaries detected by ultrasound, hirsutism, severe acne problem, irregular menstruation, and laboratory test), 7 questions about its association with other diseases (heart disease, breast cancer, endometrial cancer, infertility, increase in blood sugar, increase in insulin resistance, depression, and anxiety), and 3 questions related to the management of the disease (a chronic and incurable disease, which can be managed with drugs and weight loss/lifestyle modification).

The last part of the questionnaire was used to assess the respondents' attitude towards PCOS

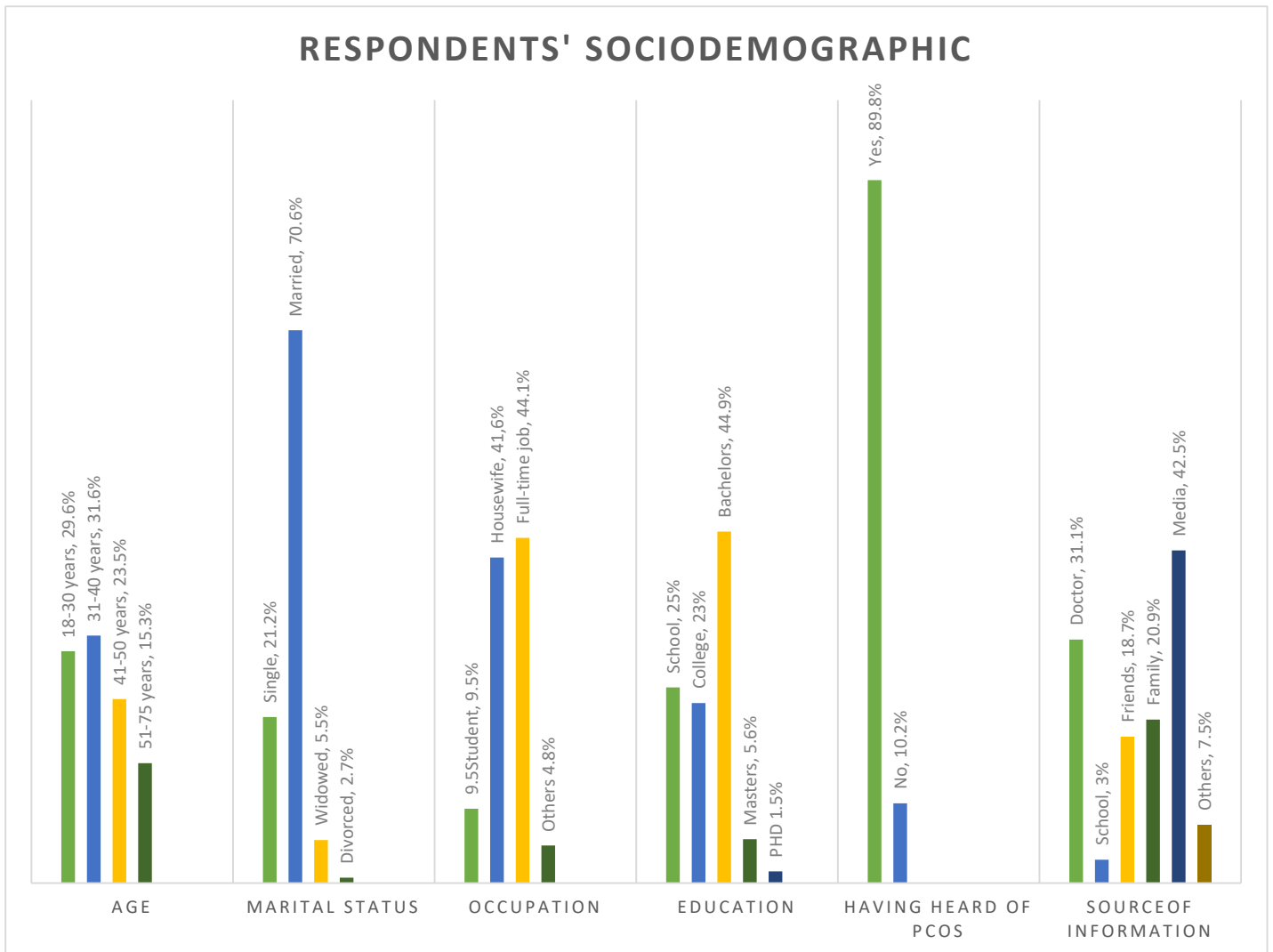
using 8 questions. The questions were about their willingness to have a doctor's consultation, tendency to consume hormone-regulating herbs, expectation of an abnormality in the ability to conceive a child, the negative impact of PCOS on their self-esteem, the need for lifetime treatment, tendency to feel depressed, the need for emotional support, and negative impact of PCOS on their work or study.

Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 23.0 for Windows. The results were described in terms of frequency and percentage. Pearson's chi-square test of independence was used to assess the correlation between sociodemographic factors and questions included in the questionnaire. In the test, a *P* value less than 0.05 was considered significant. Ethical approval for this study was obtained from the ethical review committee of the University of Jordan.

## Results

Figure 1 describes the sociodemographic characteristics of the samples. About 29.6% of the women in the study population were aged 18-30 years old, while 31.6% were aged 31-40 years old and only 15.3% were aged between 51 and 75 years. With regard to the marital status, the majority of the study samples (70.6%) were married, whereas the remaining were unmarried, widowed, or divorced. Of the study participants, 166 women were housewives (41.6%) and 176 worked full-time jobs (44.1%). In terms of education, 25% of the participants received only high school education or less, while 23% obtained a college (diploma) education. More than 50% were bachelor's degree and postgraduate degree holders.

Table 1 describes the overall knowledge about PCOS. General knowledge about the symptom and diagnosis of PCOS ranged from 40.3% to 82.8%, with patients being more knowledgeable that PCOS is characterized by abnormal menstruation followed by the belief that PCOS is characterized by multiple cysts in the ovaries, and there was least knowledge regarding the increase of acne manifestation in PCOS patients. Only 8.3% of the samples agreed that PCOS is a chronic disease. With regard to the



**Figure 1:** Participants sociodemographic

complications of PCOS, the patients’ knowledge varied with less than one-fifth of them knowing that PCOS patients have an increased insulin resistance and increased blood sugar level (14% and 16.7%, respectively). More than 50% of the samples either did not know or disagreed that PCOS patients have an increased risk of endometrial cancer. Around 63% of the samples agreed that PCOS patients have an increased risk of infertility, depression, and anxiety. Around 54.8% of the samples agreed that weight reduction can help treat PCOS, while 83% agreed that PCOS can be treated with drugs.

Table 2 describes the attitudes of the respondents towards PCOS. Overall, the

respondents have positive attitudes towards PCOS. Most of the respondents (89%) agreed to have doctors’ consultation if they were diagnosed with PCOS. More than two-thirds of the participants (72.5%) agreed that emotional support is needed for PCOS patients, and only one-third (38.3%) agreed to use herbal medications for PCOS. Further, only 14.3% agreed that PCOS needs lifelong treatment. More than two-thirds of the participants had a negative attitude towards PCOS, with patients claiming they will develop abnormalities during childbirth. More than 50% disagreed that PCOS will affect their self-confidence. Furthermore, 40% and 62.7% of the study participants disagreed that

**Table 1:** Knowledge of polycystic ovary syndrome and answers frequency

Statement	Disagree	Neutral	Agree	Total
1. Polycystic ovary syndrome is characterized by multiple cysts in the ovaries that can be diagnosed by ultrasound.	10 (2.5%)	72 (18.0%)	319 (79.6%)	401 (100.0%)
2. Polycystic ovary syndrome is characterized by increase in hair growth in places like on the upper lip, around nipples, and belly.	30 (7.5%)	173 (43.3%)	197 (49.3%)	400 (100.0%)
3. Polycystic ovary syndrome is characterized by an increase in acne in a clear and a higher than expected manner	47 (11.8%)	192 (48.0%)	161 (40.3%)	400 (100.0%)
4. Polycystic ovary syndrome is characterized by abnormal menstruation.	15 (3.7%)	54 (13.5%)	332 (82.8%)	401 (100.0%)
5. Polycystic ovary syndrome can be diagnosed by laboratory tests.	65 (16.2%)	126 (31.4%)	210 (52.4%)	401 (100.0%)
6. Polycystic ovary syndrome is chronic and has no treatment.	310 (77.7%)	56 (14.0%)	33 (8.3%)	399 (100.0%)
7. Polycystic ovary syndrome patients have an increased risk of cardiac diseases.	125 (31.3%)	255 (63.7%)	20 (5.0%)	400 (100.0%)
8. Polycystic ovary syndrome patients have an increased risk of breast cancer.	99 (24.7%)	238 (59.4%)	64 (16.0%)	401 (100.0%)
9. Polycystic ovary syndrome patients have increased blood sugar levels.	97 (24.2%)	237 (59.1%)	67 (16.7%)	401 (100.0%)
10. Polycystic ovary syndrome patients have increased insulin resistance.	77 (19.3%)	267 (66.8%)	56 (14.0%)	400 (100.0%)
11. Polycystic ovary syndrome patients have an increased risk of endometrial cancer.	40 (10.0%)	196 (49.0%)	164 (41.0%)	400 (100.0%)
12. Polycystic ovary syndrome patients have an increased risk of infertility.	50 (12.6%)	101 (25.4%)	247 (62.1%)	398 (100.0%)
13. Polycystic ovary syndrome patients have an increased risk of depression and anxiety.	22 (5.5%)	123 (30.8%)	254 (63.7%)	399 (100.0%)
14. Polycystic ovary syndrome can be treated with drugs.	19 (4.7%)	49 (12.2%)	333 (83.0%)	401 (100.0%)
15. Polycystic ovary syndrome can be treated by decreasing body weight.	40 (10.0%)	141 (35.3%)	219 (54.8%)	400 (100.0%)

**Table 2:** Attitude of polycystic ovary syndrome and answers frequency

Statement	Disagree	Neutral	Agree	Total
1. In case I or someone I know was diagnosed with Polycystic ovary syndrome, I would consult a doctor.	2 (0.5%)	6 (1.5%)	393 (98.0%)	401 (100.0%)
2. In case I or someone I know was diagnosed with Polycystic ovary syndrome, I would use hormone regulating herbs.	188 (47.0%)	59 (14.8%)	153 (38.3%)	400 (100%)
3. In case I or someone I know was diagnosed with Polycystic ovary syndrome, I would expect an abnormality in the ability to conceive a child.	40 (10.0%)	83 (20.8%)	277 (69.3%)	400 (100%)
4. In case I was diagnosed with Polycystic ovary syndrome, that would impact my self confidence negatively.	215 (53.8%)	42 (10.5%)	143 (35.8%)	400 (100%)
5. Polycystic ovary syndrome will need lifetime treatment.	214 (53.8%)	127 (31.9%)	57 (14.3%)	398 (100%)
6. In case I or someone I know was diagnosed with Polycystic ovary syndrome, I would feel depressed.	160 (40.0%)	80 (20.0%)	160 (40.0%)	400 (100%)
7. In case I or someone I know was diagnosed with Polycystic ovary syndrome, I would need emotional support.	72 (18%)	38 (9.5%)	290 (72.5%)	400 (100.0%)
8. In case I or someone I know was diagnosed with Polycystic ovary syndrome, it would affect my work/study negatively.	251 (62.7%)	44 (11.0%)	105 (26.3%)	400 (100%)

**Table 3A:** Knowledge and sociodemographic relation (marital status & education)

		Marital Status				Chi-square	Education					Chi-square
		Single	Married	Widowed	Divorced		School	College	Bachelor	Masters	PHD	
1. Polycystic ovary syndrome is characterized by multiple cysts in the ovaries that can be diagnosed by ultrasound.	Disagree	1	9	0	0	0.696	2	3	4	0	1	0.000
	Neutral	15	50	6	1		33	10	25	2	1	
	Agree	69	223	16	10		63	78	149	20	4	
2. Polycystic ovary syndrome is characterized by increase in hair growth in places like on the upper lip, around nipples, and belly.	Disagree	3	25	1	0	0.186	8	7	13	0	1	0.011
	Neutral	33	120	13	7		54	41	59	11	4	
	Agree	49	136	8	4		35	43	106	11	1	
3. Polycystic ovary syndrome is characterized by an increase in acne in a clear and a higher than expected manner	Disagree	6	39	1	1	0.616	10	14	20	3	0	0.029
	Neutral	42	132	12	6		53	51	71	8	5	
	Agree	37	110	9	4		34	26	87	11	1	
4. Polycystic ovary syndrome is characterized by abnormal menstruation	Disagree	0	11	4	0	0.008	6	4	5	0	0	0.111
	Neutral	14	36	2	2		21	13	17	2	0	
	Agree	71	235	16	9		71	74	156	20	6	
5. Polycystic ovary syndrome can be diagnosed by laboratory tests..	Disagree	10	50	3	2	0.803	10	23	29	3	0	0.154
	Neutral	27	89	8	2		32	24	54	10	3	
	Agree	48	143	11	7		56	44	95	9	3	
6. Polycystic ovary syndrome is chronic and has no treatment	Disagree	61	223	16	9	0.407	66	74	142	18	5	0.168
	Neutral	14	38	4	0		19	13	18	4	1	
	Agree	10	19	2	2		11	4	18	0	0	
7. Polycystic ovary syndrome patients have an increased risk of cardiac diseases	Disagree	21	95	3	5	0.108	27	36	53	5	1	0.355
	Neutral	61	170	19	5		64	54	113	16	5	
	Agree	3	16	0	1		7	1	11	1	0	
8. Polycystic ovary syndrome patients have an increased risk of breast cancer	Disagree	12	78	2	6	0.011	24	24	44	4	1	0.394
	Neutral	57	159	18	4		64	47	106	13	5	
	Agree	16	45	2	1		10	20	28	5	0	
9. Polycystic ovary syndrome patients have increased blood sugar levels	Disagree	15	76	2	3	0.233	26	28	36	5	1	0.192
	Neutral	58	156	16	7		60	50	102	15	5	
	Agree	12	50	4	1		12	13	40	2	0	
10. Polycystic ovary syndrome patients have increased insulin resistance	Disagree	12	58	2	4	0.311	20	22	29	4	1	0.048
	Neutral	63	181	17	6		71	55	113	18	5	
	Agree	9	43	3	1		7	14	35	0	0	
11. Polycystic ovary syndrome patients have an increased risk of endometrial cancer	Disagree	4	33	0	2	0.156	12	10	16	1	0	0.024
	Neutral	39	138	14	5		57	31	92	9	3	
	Agree	42	110	8	4		28	50	70	12	3	
12. Polycystic ovary syndrome patients have an increased risk of infertility	Disagree	1	40	5	3	0.013	14	14	20	0	0	0.053
	Neutral	26	66	6	3		34	19	39	4	1	
	Agree	56	175	11	5		48	58	118	18	5	
13. Polycystic ovary syndrome patients have an increased risk of depression and anxiety.	Disagree	5	14	2	1	0.485	7	6	7	0	1	0.146
	Neutral	23	85	10	5		35	28	46	11	2	
	Agree	56	182	10	5		54	57	125	11	3	
14. Polycystic ovary syndrome can be treated with drugs	Disagree	6	10	0	3	0.005	4	3	8	3	1	0.166
	Neutral	13	30	4	2		9	17	19	3	0	
	Agree	66	242	18	6		85	71	151	16	5	
15. Polycystic ovary syndrome can be treated by decreasing body weight	Disagree	14	24	0	2	0.046	8	10	19	2	1	0.841
	Neutral	32	93	10	6		42	31	57	7	2	
	Agree	39	164	12	3		47	50	102	13	3	

**Table 3B:** Knowledge and sociodemographic relation (Occupation & Age)

		Occupation				Chi-square	Age				Chi-square
		Student	Howfense	Full-time job	Others		18-30	31-40	41-50	51-75	
1. Polycystic ovary syndrome is characterized by multiple cysts in the ovaries that can be diagnosed by ultrasound.	Disagree	0	6	4	0	0.233	3	4	2	1	0.874
	Neutral	5	38	25	3		16	25	16	12	
	Agree	33	121	147	16		97	95	73	47	
2. Polycystic ovary syndrome is characterized by increase in hair growth in places like on the upper lip, around nipples, and belly.	Disagree	3	18	7	1	0.002	9	8	10	2	0.058
	Neutral	15	82	63	12		40	52	48	28	
	Agree	20	64	106	6		67	64	33	30	
3. Polycystic ovary syndrome is characterized by an increase in acne in a clear and a higher than expected manner	Disagree	4	21	18	3	0.031	10	21	10	6	0.018
	Neutral	14	93	74	10		43	59	49	33	
	Agree	20	50	84	6		63	44	32	21	
4. Polycystic ovary syndrome is characterized by abnormal menstruation	Disagree	1	8	6	0	0.159	1	4	5	5	0.024
	Neutral	3	28	17	5		9	17	18	10	
	Agree	34	129	153	14		106	103	68	45	
5. Polycystic ovary syndrome can be diagnosed by laboratory tests..	Disagree	8	23	28	5	0.569	8	25	24	8	0.011
	Neutral	15	53	53	5		39	37	28	18	
	Agree	15	89	95	9		69	62	39	34	
6. Polycystic ovary syndrome is chronic and has no treatment	Disagree	30	124	139	14	0.966	94	100	66	43	0.089
	Neutral	5	24	23	4		11	18	18	8	
	Agree	3	15	14	1		10	5	7	9	
7. Polycystic ovary syndrome patients have an increased risk of cardiac diseases	Disagree	7	56	51	9	0.086	34	38	31	17	0.993
	Neutral	30	103	112	9		76	79	56	40	
	Agree	0	6	13	1		6	6	4	3	
8. Polycystic ovary syndrome patients have an increased risk of breast cancer	Disagree	7	49	35	6	0.175	29	32	22	12	0.696
	Neutral	25	97	105	10		65	75	52	41	
	Agree	6	19	36	3		22	17	17	7	
9. Polycystic ovary syndrome patients have increased blood sugar levels	Disagree	8	50	31	6	0.078	24	28	28	15	0.477
	Neutral	25	94	108	9		72	79	46	33	
	Agree	5	21	37	4		20	17	17	12	
10. Polycystic ovary syndrome patients have increased insulin resistance	Disagree	7	40	23	5	0.005	22	20	21	12	0.818
	Neutral	28	111	116	11		80	85	57	38	
	Agree	3	13	37	3		13	19	13	10	
11. Polycystic ovary syndrome patients have an increased risk of endometrial cancer	Disagree	2	22	12	2	0.197	12	11	10	5	0.449
	Neutral	17	84	84	11		50	57	49	35	
	Agree	19	58	80	6		54	55	32	20	
12. Polycystic ovary syndrome patients have an increased risk of infertility	Disagree	3	24	20	2	0.147	18	10	13	8	0.604
	Neutral	8	52	36	5		29	29	25	14	
	Agree	26	87	120	12		68	84	53	37	
13. Polycystic ovary syndrome patients have an increased risk of depression and anxiety.	Disagree	0	15	5	2	0.03	5	8	4	5	0.647
	Neutral	11	49	54	9		33	32	31	20	
	Agree	27	100	117	7		78	84	55	34	
14. Polycystic ovary syndrome can be treated with drugs	Disagree	1	6	10	2	0.616	6	5	2	6	0.443
	Neutral	4	19	22	4		13	15	11	9	
	Agree	33	140	144	13		97	104	78	45	
15. Polycystic ovary syndrome can be treated by decreasing body weight	Disagree	7	15	16	1	0.193	14	9	10	6	0.663
	Neutral	17	61	55	8		34	45	35	23	
	Agree	14	88	105	10		68	70	45	31	

**Table 4A:** Attitude and sociodemographic relation (Marital status & Education)

		Marital Status				Chi-square	Education					Chi-square
		Single	Married	Widowed	Divorced		School	College	Bachelor	Masters	PHD	
1. In case I or someone I know was diagnosed with Polycystic ovary syndrome, I would consult a doctor.	Disagree	0	2	0	0	0.699	1	1	0	0	0	0.917
	Neutral	0	5	1	0		2	2	2	0	0	
	Agree	85	275	21	11		96	88	175	22	6	
2. In case I or someone I know was diagnosed with Polycystic ovary syndrome, I would use hormone regulating herbs.	Disagree	34	135	13	5	0.752	42	48	81	12	2	0.198
	Neutral	13	42	3	1		12	19	25	1	1	
	Agree	37	105	6	5		45	24	70	9	3	
3. In case I or someone I know was diagnosed with Polycystic ovary syndrome, I would expect an abnormality in the ability to conceive a child.	Disagree	9	25	3	3	0.403	12	12	15	1	0	0.038
	Neutral	21	56	5	1		28	23	26	3	0	
	Agree	54	201	14	7		59	56	135	18	6	
4. In case I was diagnosed with Polycystic ovary syndrome, that would impact my self-confidence negatively.	Disagree	43	153	13	5	0.55	36	54	101	16	5	0.001
	Neutral	12	25	4	1		18	10	10	3	0	
	Agree	29	104	5	5		45	27	65	3	1	
5. Polycystic ovary syndrome will need lifetime treatment.	Disagree	36	160	9	8	0.179	46	49	99	11	5	0.428
	Neutral	35	81	9	2		33	33	52	8	0	
	Agree	13	39	4	1		19	9	25	3	1	
6. In case I or someone I know was diagnosed with Polycystic ovary syndrome, I would feel depressed.	Disagree	31	111	10	7	0.166	28	43	71	13	3	0.161
	Neutral	21	52	7	0		22	16	35	4	1	
	Agree	32	119	5	4		49	32	70	5	2	
7. In case I or someone I know was diagnosed with Polycystic ovary syndrome, I would need emotional support.	Disagree	16	48	4	4	0.055	15	18	28	8	3	0.008
	Neutral	9	22	6	1		17	6	13	0	0	
	Agree	59	212	12	6		67	67	135	14	3	
8. In case I or someone I know was diagnosed with Polycystic ovary syndrome, it would affect my work/study negatively.	Disagree	47	181	15	7	0.563	55	61	107	19	5	0.224
	Neutral	14	26	3	1		12	11	19	1	0	
	Agree	23	75	4	3		32	19	50	2	1	

**Table 4B:** Attitude and sociodemographic relation (Occupation & Age)

		Occupation					Chi-square	Age				Chi-square
		Student	House wife	Full-time job	Others	18-30		31-40	41-50	51-75		
1. In case I or someone I know was diagnosed with Polycystic ovary syndrome, I would consult a doctor.	Disagree	0	1	0	1	0.053	0	1	0	1	0.805	
	Neutral	0	3	2	1		2	2	1	1		
	Agree	38	162	173	17		114	120	91	58		
2. In case I or someone I know was diagnosed with Polycystic ovary syndrome, I would use hormone regulating herbs.	Disagree	13	76	86	11	0.635	50	56	49	29	0.751	
	Neutral	6	25	25	3		17	21	13	7		
	Agree	19	64	64	5		49	45	30	24		
3. In case I or someone I know was diagnosed with Polycystic ovary syndrome, I would expect an abnormality in the ability to conceive a child.	Disagree	3	19	16	2	0.028	11	13	9	6	0.997	
	Neutral	1	43	33	6		25	25	21	11		
	Agree	34	103	126	11		80	84	62	43		
4. In case I was diagnosed with Polycystic ovary syndrome, that would impact my self confidence negatively.	Disagree	19	89	98	8	0.796	68	66	54	23	0.168	
	Neutral	4	17	17	4		13	10	8	9		
	Agree	15	59	60	7		35	46	30	28		
5. Polycystic ovary syndrome will need lifetime treatment.	Disagree	17	87	98	10	0.865	65	68	46	30	0.027	
	Neutral	16	53	51	6		30	39	39	16		
	Agree	5	23	26	3		21	13	7	14		
6. In case I or someone I know was diagnosed with Polycystic ovary syndrome, I would feel depressed.	Disagree	13	68	71	6	0.882	49	42	43	24	0.279	
	Neutral	8	29	38	5		24	21	21	12		
	Agree	17	68	66	8		43	59	28	24		
7. In case I or someone I know was diagnosed with Polycystic ovary syndrome, I would need emotional support.	Disagree	5	27	36	4	0.417	23	16	16	16	0.098	
	Neutral	5	16	13	4		13	11	5	9		
	Agree	28	122	126	11		80	95	71	35		
8. In case I or someone I know was diagnosed with Polycystic ovary syndrome, it would affect my work/study negatively.	Disagree	22	100	115	12	0.64	69	76	63	37	0.378	
	Neutral	5	22	13	3		18	11	10	4		
	Agree	11	43	47	4		29	35	19	19		

PCOS would make the patient feel depressed or will affect their work and studies negatively.

Table 3 describes the relation between the sociodemographic characteristics and knowledge about PCOS. Bachelor's degree holders were significantly more likely to agree that PCOS is characterized by multiple cysts, increased hair growth, and acne (P value 0.00, 0.01, and 0.029, respectively). In addition, women who worked full-time jobs were more likely to know that PCOS is characterized by increased hair growth and acne with a significant P value of 0.002 and 0.031, respectively. Married women were more likely to know that PCOS is characterized by abnormal menstruation and an increased risk of infertility with a significant P value of 0.008 and 0.013, respectively. Moreover, married women were more likely to know that PCOS is treated with drugs and weight reduction. Women who worked full-time jobs were significantly more likely to agree that PCOS will increase the risk of depression and anxiety. With regard to age, women aged 18-30 years were significantly more likely to agree that PCOS is related to increased acne and abnormal menstruation and that it can be diagnosed by laboratory test (P value 0.018, 0.024, and 0.011, respectively).

Table 4 describes the relation between sociodemographic characteristics and the attitudes of the participants towards PCOS. A significant number of bachelor degree holders agreed that patients with PCOS will expect an abnormality during childbirth with a P value of 0.038, while 101 of them disagreed that PCOS will impact self-confidence with a significant P value of 0.001. In addition, bachelor's degree holders were more likely to agree that emotional support is needed for PCOS patients (P value 0.008). In terms of the ability of PCOS patient to conceive, women who work in full-time jobs were more likely to agree that PCOS patients will develop some abnormalities. Patients aged 31 to 40 years were more likely to disagree that PCOS requires lifetime treatment with a significant P value of 0.026. Of the study participants, 86% stated that they need more information about PCOS, with doctors being the preferred source of information (75%) followed by the media (21%), friends (4%), and other sources (5%) (figure not shown).

## Discussion

This study reported on the knowledge and attitude of the Jordanian women population towards PCOS and its relation to the sociodemographic factors. In the present study, 89% of the study population were aware of the term PCOS. This signifies a higher and more satisfying number than that of previous studies conducted in Central India and Saudi Arabia where the number of subjects that were aware of the term PCOS were 41% and 56%, respectively<sup>21,22</sup>. A similar study<sup>23</sup> showed that 58% of the study population have minimal knowledge about PCOS. To the extent of our knowledge, this is the first study to assess the level of knowledge and attitude towards PCOS conducted in Jordan. In our study, a majority of the female population have adequate knowledge on the most common symptoms, diagnosis, and management of PCOS; meanwhile, in one study conducted by Safa *et al*<sup>23</sup>, most of the study population agreed that PCOS patients will have problems during pregnancy and irregular periods. However, the population's knowledge on disease management was insufficient in most aspects (e.g., benefits of exercise and treatment options). In contrast to our study, more than 50% of the respondents agreed that PCOS can be treated with drugs and weight reduction.

We also found that our study population had a positive attitude towards PCOS. There was a lack of studies assessing the attitude of the general population towards PCOS. However, a study conducted in Pakistan among PCOS patients found that the negative attitude developed among PCOS patients was from the psychological effects of depression and anxiety as a result of the comorbidities and physical changes<sup>24</sup>.

As expected, we found that a high educational level is the most significant sociodemographic factor that attributed to the satisfactory level of knowledge and positive attitudes towards PCOS. This finding might be due to the fact that educated women tend to get more medical information through their studies or through attending scientific and public activities related to health problems<sup>25</sup>. This finding also can be explained by better utilization of the media in acquiring information, as we found that the most common sources of information were the media. A

study conducted in Saudi Arabia reported a satisfactory level of knowledge related to the high educational-level group especially among students or workers with a healthcare background<sup>22</sup>.

Another finding is that married women were found to have sufficient knowledge on PCOS, whereby they agreed more on the effect of PCOS on the inability to give birth and abnormal menstruation. This can be explained by the culture of Jordanian women who tend to seek more women healthcare services after marriage as compared to single women. However, a study conducted in Saudi Arabia failed to find any relationship between marital status and knowledge on PCOS<sup>22</sup>.

It is notable that respondents in the 18-30 age group were more likely to agree that PCOS will cause symptoms such as severe acne and abnormal menstruation. We speculate that this might be due to the fact that women in this age group were more concerned about their appearance and physical changes<sup>26</sup>.

The present study confirmed the findings of the lack of knowledge among the study population regarding the complications of PCOS, particularly on the increased risk for cardiac diseases, high blood sugar levels, insulin resistance, and endometrial cancer. This result corresponds well with those of previous studies that also demonstrated similar results<sup>18-20</sup>. Consequently, the lack of knowledge will lead to ignorance of the complications until the problem worsens. Poor communication and the lack of comprehensive approach towards PCOS might be the cause of this result as a study conducted by Colwell *et al*<sup>27</sup> reported that many women with PCOS expressed their frustration in communicating with their primary healthcare provider, leading to their negative attitude towards the disease. Proper management and treatment can help control the symptoms, thereby improving the quality of life and preventing long-term complications.

## Limitation

The studied women included were not asked if ever received the diagnosis of PCOS, knowing that the majority were collected from Family medicine clinic in Jordan university hospital were most patients present with different spectrum of medical

and mental health problems not only gynecological problem, making the probability the diagnosis of PCOS low, but still might affect the result of the current study, this point will be considered in future more in-depth studies.

## Conclusion

PCOS involves a convergence of chronic multisystem endocrine imbalances. It is a complex, common but under-recognized condition. Spreading a high level of awareness and positive attitude towards PCOS is important, as shown in our result that most women lack knowledge about PCOS complications. As complications are the main problems associated with PCOS, this is potentially concerning and need to be appropriately addressed. Here, we firstly recommend the health sector to organize more campaigns on the awareness of PCOS by focusing more on the long-term complications of the disease as most of the study population in the present study preferred doctors as their source of information. Secondly, the healthcare providers should optimize their consultation and maintain effective communication with PCOS patients. In future works, strictly implementing the recommendation to screen for metabolic syndromes, cardiovascular diseases, and mood disorders among PCOS patients might improve the long-term prognosis.

## Conflict of interest

The author reports no conflicts of interest in this work.

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