ORIGINAL ARTICLE

Knowledge and attitude of young female population toward early diagnosis of polycystic ovary syndrome

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ABSTRACT

Background and Objective: The heterogeneous illness known as polycystic ovary syndrome (PCOS) causes multisystem morbidities and is one of the major causes of female infertility. This study aimed at assessing the knowledge and attitude of the young female population towards the early diagnosis of PCOS in Pakistan.

Methods: This cross-sectional questionnaire-based survey study was carried out at the Lahore Wapda Hospital Complex, Pakistan over a period of 1 year (January 2021 to 2022). A total of 1,278 females with active PCOS from 18-23 years of age were selected for the study from all provinces of Pakistan. A total of 96 responses were excluded because of inconsistency, incompletion, or duplication while the remaining 1,182 respondents were finally included in the study. Regression analysis, analysis of variance, and *t*-test were applied for statistical inferences.

Results: Only 45.3% of the patients had significant knowledge (p-value = 0.001) or a positive attitude about the early diagnosis of PCOS. The participants who were diagnosed with abdominal ultrasonography scored significantly higher in attitude towards earlier diagnosis than those who were diagnosed with serum gonadotropins and/or androgens levels (p = 0.001).

Conclusion: Lack of appropriate information and awareness regarding PCOS and its complications while bearing a poor attitude concerning the early diagnosis of this syndrome leads to higher disease burden and morbidity in our younger female population.

Keywords: Knowledge, attitude, polycystic ovary syndrome, early diagnosis.

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Introduction

The heterogeneous illness known as polycystic ovary syndrome (PCOS) causes an excessive synthesis of androgens, primarily from the ovaries. There exist specific clinical, biochemical, and ultrasonographic criteria to diagnose the syndrome linked to insulin resistance.[1] Although the leading cause of the disease is still needed to be known and the role of genes in its pathophysiology is being studied as individuals with genetic history are more prone to the disease symptoms when confronted with specific environmental situations.[2] Several clinical findings are associated with the disease but are not limited to signs and symptoms of hyperandrogenemia (acne, hirsutism, male pattern baldness, abnormal unintended weight gain) as well as the signs and symptoms of abnormal ovulation such as irregular heavy menstruation, amenorrhea, oligomenorrhea, and/or subfertility.[3] Other signs and symptoms include insulin resistance along with darker skin folds, obesity, and hair loss. A diagnosis is typically made when a patient demonstrates two primary characteristics among the three: hyperandrogenism, polycystic ovaries, and ovulation failure.[4] Early diagnosis and treatment might reduce the complications faced by the patients due to long-standing diseases. Between 40% and 80% of PCOS patients are overweight or obese, which raises their risk of developing metabolic syndrome, and/or endometrial hyperplasia.[5] Studies have revealed a knowledge and attitude difference among females regarding PCOS, its symptoms, indicators, and the etiology among different populations.[6-10] Reproductive and metabolic issues linked to PCOS result mostly from a delayed diagnosis. This syndrome is not only regarded as the primary cause of infertility among females but is related to short or long-term clinical

manifestations including psychological impairment, anxiety, and depression. Other grave consequences include mental and eating disorders, marital and social incompatibility issues, and dysfunctional sexual activity. As a result, women with PCOS have a significantly lower quality of life.[11-14] The purpose of this study was to evaluate the level of attitude and knowledge among Pakistani women regarding early diagnosis of PCOS.

Methods

This cross-sectional survey study was carried out at the Wapda Medical Complex, Lahore, Pakistan over a year (January 2021 to 2022). A total of 1,278 consenting young females, 18-23 years of age, diagnosed with PCOS, and living in Pakistan (all provinces), were selected for the study. The responses were collected by distributing a self-structured questionnaire with questions based on early diagnosis of PCOS. A group of professionals comprised of academicians, gynecologists, and investigators examined the questions to validate their content and context before distribution. These professionals evaluated the questionnaire's material in terms of its applicability, accuracy, accessibility, and uncertainty. The validity of the questionnaire was ensured after revisions and modifications in light of the suggestions by the group of professionals. For the benefit of certain respondents between the ages, the questionnaire was developed in the English language and then translated into Urdu language. Participants who attended the Wapda Medical Complex Lahore, Pakistan for the diagnosis of gynecological ailments were interviewed by senior gynecologists to collect the information. The following variables were discussed: participants' marital status, age, and level of education. Identification of symptoms of disease (4 spikes), signs (9 spikes) and diagnosis (3 spikes), therapy (8 spikes), and related situations (8 spikes) was used to gauge participants' awareness of and attitudes toward PCOS (4 spikes). Only the consenting participants were enrolled in the study. The given answers were entered into the spreadsheet of Excel for the final statistical analysis.

Statistical analysis

Data were entered and analyzed using SPSS version 23.0. Regression analysis, analysis of variance, and *t*-test were used. After measuring each variable's correlation with PCOS scores, a confounder's analysis was conducted. A multivariate linear regression model was then used to examine independent and statistically important factors

Table 1. *Patients demographics.*

Variables	Frequency (*n* = 1,182)	Percentage	Average score (95% CI)	*t*-test *p*-value
Age (Years)				
18-20	1,042	88.2	11.7 (11.3-12.2)	<0.001
20-23	140	11.8	12.0 (11.2-12.8)	
Marital status				
Single	1,098	92.8	11.0 (7.9-14.1)	0.612
Divorced	73	6.17	11.6 (11.3-11.9)	
Married	11	0.93	12.1 (11.0-13.3)	
Educational status				
Middle	387	32.7	9.9 (9.4-10.4)	<0.001
Intermediate	474	40.1	12.0 (11.6-12.4)	
Higher education	321	27.2	13.1 (12.5-13.6)	

Table 2. *Source of investigation or diagnostic tool for early diagnosis of PCOs.*

Statistics	Abdominal ultrasound (*n* = 1,182)			Serum gonadotrophins (*n* = 1,182)			Serum androgens (*n* = 1,182)		
	Yes	No	I am not sure	Yes	No	I am not sure	Yes	No	I am not sure
Count	500	655	27	429	669	84	323	797	62
Percentage	42.3	55.4	2.3	36.2	56.6	7.2	27.3	67.4	5.3
Mean	13.50	10.21	9.81	13.83	10.37	9.90	14.38	10.48	11.42
SD	4.22	5.01	4.56	3.95	5.07	4.61	3.59	5.04	4.25
ANOVA	F (2.1179) = 72.201, p < 0.001			F (2.1179) = 77.824, p < 0.001			F (2.1179) = 80.972, p < 0.001		

F = Variation between sample means/variation within the samples.

about the overall knowledge and attitude toward PCOS. A *p*-value of <0.05 was taken as statistically significant.

Results

Out of 1,278 participants, 96 respondents were excluded because 74 had inconsistent or incomplete while 22 had duplicate responses. The remaining 1,182 respondents were considered for analysis only. Table 1 presents patients' demographics categorized as age, marital status, and level of education. Level of awareness regarding PCOS varied considerably by age group (*p* 0.001). After considering marital status as a covariate in the study, the variation in score between age groups was no longer significant (*p* = 0.613). The participants' scores at various educational levels varied significantly ($p < 0.001$) (Table 1).

Table 2 shows the source of investigation or diagnostic tools of PCOS like abdominal ultrasonogram (USG), serum gonadotropins, and androgens levels. Furthermore, patients with PCOS who had abdominal USG (*n* = 500, mean = 13.50, SD = 4.22) performed considerably better (*n* = 655, mean = 10.21, SD = 5.01, *p* 0.001) than those without ultrasound. Participants who said they had an abdominal ultrasound, serum gonadotropins, and androgen levels all done to check for PCOS, scored quite higher than those who did not go for these baseline investigations (Table 2).

Table 3 provides a summary of participants' comments about the symptoms of PCOS. After controlling for the examined variables as confounders, having hirsutism, an irregular menstrual cycle, acne, and frequency of the cycle were the most critical factors. These were also considered significant predictors.

Table 4 shows the knowledge of females about the early diagnosis of PCOS. Results were significant (*p*-value = 0.001) as only 45.3% of patients had considerable knowledge about the early diagnosis of PCOS.

Table 5 shows the attitude of females about the early diagnosis of PCOS. A total of 47.2% of patients had a thorough understanding of the importance of an early diagnosis of PCOS.

Discussion

This study is a diverse patient-based study in Pakistan that determined the knowledge and attitude of PCOS in quite a younger age group. Lack of proper knowledge and attitude toward behaviors connected to the genesis of the condition is attributed to the increasing occurrence of PCOS.[15] In Pakistan, without exceptions, PCOS constitutes one of the most contentious endocrine conditions. It is one of the major causes of infertility in females with little awareness of its symptoms characterized by cystic acne, hirsutism, and menstrual irregularities among women.[1,2] In this study, a total of 1,042 women participated in the age range of 18-23

Table 3. *Symptoms of PCOS as reported by 1,182 participants.*

Statistics	Irregular cycle				Hirsutism				Cycle frequency				Acne			
	Never	Few times	Many times	Always	Never	Few times	Many times	Always	<22 days	22-40	>40 days	Never	Few times	Many times	Always
Count	275	409	284	214	399	288	218	277	156	902	124	206	362	324	290
Percentage	23.3	34.6	24.0	18.1	33.8	24.4	18.4	23.4	13.2	76.4	10.4	17.4	30.6	27.4	24.6
Mean	10.92	11.25	11.77	12.90	10.98	10.92	11.69	13.10	9.74	11.72	13.05	11.02	11.65	11.78	10.98
SD	5.21	4.88	4.81	4.73	5.12	4.99	4.58	4.63	4.93	4.94	4.40	5.11	4.98	4.88	4.99
ANOVA	$p < 0.001$				$p < 0.001$				$p < 0.001$			$p = 0.03$			

Table 4. *Patient's knowledge about the early diagnosis of PCOS (N = 1,182).*

Parameters	Yes (%)	No (%)	p-value
A metabolic syndrome is a group of symptoms that increases my risk for endometrial cancer	73 (13.6)	167 (25.9)	0.001
It is common in women from 15 to 44 years of age.	33 (6.1)	70 (10.8)	
Laboratory tests can diagnose PCOS	06 (1.1)	28 (4.3)	
Abnormal menstruation is the primary indication of PCOS.	11 (2.0)	40 (6.1)	
It may lead to infertility.	02 (0.3)	08 (1.2)	
It is chronic and does not have treatment.	15 (2.7)	47 (7.2)	
Patients with PCOS may have an increased risk of breast cancer, increased sugar levels, and cardiac disease.	42 (7.9)	66 (10.2)	
It may develop facial hair	104 (19.4)	14 (2.1)	
It may develop excessive hair growth on face, chest, and belly	112 (20.8)	23 (3.5)	
It may develop acne and worsens acne	10 (1.9)	08 (1.2)	
It may develop weight gain and obesity	20 (3.7)	07 (1.0)	
It may develop obstructive sleep apnea	07 (1.3)	40 (6.1)	
It may develop thinning of hair on the head	07 (1.3)	05 (0.7)	
PCOS patients have an increased risk of depression and anxiety	69 (12.8)	09 (1.3)	
Darkened, thickened skin around the neck, armpits, or breasts	07 (1.3)	04 (0.6)	
High blood pressure and high cholesterol	11(2.0)	85 (13.1)	
PCOS can be treated by decreasing body weight.	1 (0.1)	4 (0.6)	
PCOS can be treated with medication.	06 (1.1)	21(3.2)	
Total	536 (45.4)	646 (54.6)	

Table 5. *Patient's attitude to the early diagnosis of PCOS (N = 1,182).*

Parameters	Yes (%)	No (%)	*p*-value
Take it seriously and will go to the doctor for further consultation.	53 (9.5)	134 (21.5)	0.001
I would use hormone-regulating herbs to treat when I will come to know	163 (29.1)	69 (11.0)	
I will not take it seriously	120 (21.4)	88 (14.3)	
Diagnosis would impact my self-confidence negatively.	114 (20.5)	84 (13.5)	
Scared to think that it needs lifetime treatment.	31 (5.5)	83 (13.3)	
I would feel depressed	50 (9.0)	25 (4.0)	
I will ignore it and would not take treatment.	28 (5.0)	140 (22.4)	
Total	559 (47.3)	623 (52.7)	

years. Acne followed by hirsutism and irregular menstrual cycle were the commonest presenting symptoms. Overall, this survey revealed that the majority of participants (54.6%) had poor knowledge about the earlier diagnosis of PCOs and an equal number of females depicted a negative attitude toward seeking a timely diagnosis of PCOS. Additionally, the findings indicated that the level of education was related closely to the knowledge about PCOS. These findings are in concordance with the published research from Jordan comprising 413 adult females and another study from Saudi Arabia where 227 adult females were recruited; both studies described the strong association between educational status and knowledge about PCOS.[15,16] This information however was contrary to the ones published in the United States of America where Rao et al.[17] and Lin et al.[18] conducted a study on 722 and 475 respondents respectively and concluded that the level of awareness about PCOS did not correlate with the level of education. A locally published study from Karachi, Pakistan including 196 female patients with PCOS reported that raising knowledge of environmental risk screening helped women guarantee self-checks and reduce their risk of developing PCOS by including weight maintenance in their daily routines. A follow-up study by Mohamed (2016) with 110 respondents indicated comparable findings, indicating that most subjects had an adequate understanding of following educational programs, which of course required a reasonable and appropriate educational status.[19] In another study from Pakistan, Zulfiqar et al.[20] enrolled 130 women

with PCOS and found that the majority of the participants had an age range between 18 and 30 years. Their findings showed that 18.4% of PCOS patients had significant facial hair development, and 53.8% had experienced worsening hormonal acne.[20] These findings are consistent with this study.

According to another study done in Pakistan, the increasing incidence of the condition was observed even in the pre-adolescent age range, hence there is a strong need to expand the scope for assessment and clinical evaluation of not only symptomatic females of the adult population but also in the younger population who are showing risk factors indicative of the syndrome. One of the study's main points of focus was on gathering data from young girls because it is known that the likelihood of developing PCOS is highest during adolescence and young adulthood compared to older age groups.[21] Obesity worsens the PCOS symptoms like hirsutism and infertility. More than 75% of the women in this study reported irregular menstrual cycles. Additionally, this finding was consistent with another study,[22] that found that young girls with PCOS (from the ages of 15-20 years) felt more aware and motivated to use preventive health measures for weight gain after participating in a clinical research study. These results are also consistent with a study published in India which reported that 46.50% of infertile women had PCOS and that the majority (71.53%) of them were between the ages of 21 and 30 years.[23] This study reveals that 45.4% of patients had a strong understanding and positive attitude toward earlier diagnosis of PCOS at a younger age while the majority of them had a negative attitude and inconsistent knowledge on the subject. These results are consistent with a similar study conducted in India on younger age group patients.[24] This highlights the significance of evaluating and diagnosing the adolescent and younger female population through a methodical approach so as to prevent the development of multisystem morbidities like impaired glucose tolerance, type 2 diabetes, cardiovascular diseases, and an increased risk of endometrial cancers in future.

Conclusion

It is concluded that young female patients with PCOS in Pakistan have inconsistent information regarding the disorder and its complications, and exhibit a negative attitude toward earlier diagnoses of the syndrome. These attributes are significantly associated with the educational status.

Limitations of the study

This study has several limitations. Firstly, because it was a cross-sectional study, hence the patients reporting to the hospital, as and when, were selected which might not be generalizable. The study only involved one clinical center. A more diverse population may be recruited for better generalizability. No control group is available to compare to the research respondents. As a result, conclusions were drawn from interpretations from the earlier published research.

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List of Abbreviations

ANOVA	Analysis of variance
PCOS	Polycystic ovary syndrome
SD	Standard deviation

Conflict of interest

None to declare.

Grant support and financial disclosure

None to disclose.

Ethical approval

The ethical approval of the study was obtained from the institutional Ethical Review Committee of Wapda Medical Complex Lahore vide Letter No. 411/WHL/2019 dated 10th November, 2019.

Authors' contributions

SN, FA: Conception and design of study. Acquisition and analysis of data, drafting of manuscript, and critical intellectual input.
YI, ZN: Acquisition and analysis of data and literature search.
MJ: Drafting of manuscript and critical intellectual input.
ALL AUTHORS: Approval of the final version of the manuscript to be published.

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