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Original Research Article

Study of knowledge, attitude and practice about polycystic ovarian syndrome among PCOS patients

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ABSTRACT

Background: Polycystic ovarian syndrome (PCOS) is a common endocrine disorder with hormonal imbalance affecting the reproductive age. Adequate knowledge and attitude play a vital role in practice of disease. This study was conducted to assess the knowledge, attitude and practice about polycystic ovarian syndrome among PCOS patients in south Kerala.
Methods: This was a hospital based descriptive study carried out among PCOS patients in a tertiary care hospital for a period of 4 months which included data collection. The 200 subjects were classified based on inclusion and exclusion criteria out of which 38 subjects were lost to follow up hence a total of 162 patients were included in the study.
Results: Majority of subjects had good knowledge (85.8%), attitude (69.8%) and practice (53.7%) towards the PCOS. There was a statistically significant association between knowledge towards PCOS and demographic characteristics (education) and there is also significance in case of association between attitude and education. Hence, there is no association between practice and demographic details. The knowledge and attitude, knowledge and practice, attitude and practice were found to have a positive association between them towards PCOS. There was no link between age groups and medication adherence levels.
Conclusion: The presents study provides variable insights into the knowledge, attitude and practice towards PCOS among PCOS patients, offers guidance and resource for the future study. The healthcare providers should consider effective communication with PCOS patients. These findings help in implementing awareness towards PCOS and its early detection**.**

Keywords: PCOS, Knowledge, Attitude, Practice, Medication adherence

INTRODUCTION

Polycystic ovarian syndrome (PCOS) is a most common heterogeneous of uncertain etiology or hormonal disorder in women. The disturbance in the reproductive organs like luteinizing hormone (LH), follicle-stimulating hormone (FSH), estrogen, and testosterone interrupts the normal menstrual cycle and leads to amenorrhea and oilgomenorrhoea.[1] PCOS possess a significant public health issue.[2] Earlierly PCOS was, Stein-Leventhal syndrome. The clinical features broadly divided into 3 categories; clinical, endocrine and metabolic. The clinical features are menstrual abnormalities, acne, hirsutism, alopecia, recurrent miscarriages and infertility. The endocrine features are elevated levels of androgens, estrogen, LH and prolactin. The metabolic features include obesity, insulin resistance, dyslipidemia, type 2 DM and impaired glucose tolerance.[3]

Defect of ovarian theca cells is the underlying cause of PCOS results in increased androgen synthesis and clinical and biochemical manifestation of disease.[4] Stein and Leventhal concluded that a high ratio of LH to FSH is one of the characters of PCOS. They also suggested that PCOS

is caused by increased frequency of gonadotropin releasing hormone (GnRH) that stimulates theca cells to produce androgen, decreased levels of FSH, pancreatic beta cell dysfunction, insulin resistance (due to post receptor defect in fat tissue and skeletal muscles) and obesity.[4,5] The influence of genetic factors plays a role in PCOS, especially heart disease and cerebral stroke. The increased likelihood of insulin resistance is associated with PCOS having certain genes (INSIG2) and development of type 2 DM with body weight gain.[6] Insulin resistance can cause dyslipidaemia and PCOS patients are at high risk for cardiovascular disease and DM.[7] There was an assumption that the dysregulation in neuroendocrine system results in imbalance of hypothalamic, pituitary, ovarian axis leading to increased level of gonadotropin.[8]

The diagnostic criteria of were revised by Rotterdam European society for human reproduction/American society of reproductive medicine. They established 3 key diagnostic features of PCOS: anovulation (menstrual irregularity), hyperandrogenism (clinical or biochemical) and polycystic ovaries (by ultrasound).[9] There is limitation in their ability to predict reproductive outcome.[10] A recent guideline from International PCOS Network recommended the use of Rotterdam criteria in adult and the requirements of oligo-anovulation and hyperandrogenism for PCOS diagnosis in adolescents.[11] As by Rotterdam criteria, hyperandrogenism is present in about 60-8% of cases.

The first line treatment in patients with PCOS should be improvement in lifestyle. In overweight and obese patients, weight loss due to changes in diet and physical activity reduces the serum insulin and androgen levels and which decrease the risk of developing glucose intolerance and type DM.[12] Pharmacological interventions are used in case of insulin resistance/glucose tolerance or dyslipidemia.[13] Another treatment choice is metformin, the most commonly used in metabolic control of PCOS. Therapeutic effects of metformin (insulin sensitizing and hypoglycaemic effect) are well established in PCOS patients.[14] Liraglutide (GLP 1 receptor agonist) and orlistat (lipase inhibitors) are effective to induce weight loss, reduce waist circumference and improve clinical and biochemical markers of hyperandrogenism.[15,16]

The second line treatment is ovulation induction by clomiphene citrate. Some systematic reviews suggest that the drug will induce the ovulation either access sole agent or in combination with clomiphene.[17] 75% of the pregnancies in PCOS patients using clomiphene are conceived in first 3 months of treatment.[4] The addition of metformin to clomiphene citrate increased the ovulation and clinical pregnancy rates but also increased the miscarriage rate compared with clomiphene citrate alone.[14,18] Letrozole (aromatase inhibitors) is used as alternative to induce ovulation in PCOS patients who can't tolerate clomiphene citrate. Patients with problem of infertility PCOS are recommended for gonadotropins (induce ovulation) or laparoscopic surgery (successfully trigger ovulation) such as ovarian biopsy and electrocautery, USG transvaginal ovarian needle trilling or laparoscopic ovarian multi- needle intervention and transvaginal hydrolaproscopy.[19]

The aim of this study is to review the present status of knowledge, attitude and practice among the PCOS patients and formulating the clinically relevant research direction to move forward.

METHODS

Study design

A hospital based descriptive study was conducted from December 2023 to April 2024 for 4 months during which 200 patients of PCOS on the study period were enrolled. The study was conducted among PCOS patients in Obstetrics and Gynaecology department at NIMS hospital Neyyattinkara, Trivandrum, Kerala, India. Ethical approval was taken from Institutional Ethical Committee dated December 2023. All procedures followed ethical standards on human experimentation i.e., data collection.

Sample size

The consecutive sampling technique was used to get a sample size of 200 cases. The participants were enrolled based on the inclusion and exclusion criteria.

Inclusion criteria

The inclusion criteria include age group between 15–35 years, able to understand and reply to the questions and those who were willing to participate in the study.

Statistical analysis

All the data were collected in a structured proforma and entered in MS Excel Spreadsheet. Demographic and clinical characteristics of the study population were analysed using descriptive statistics. Categorical variables were expressed as frequency and percentage and continuous variables were expressed as mean and standard deviation. The knowledge, attitude, and practice scores were calculated and categorized into poor, average, and good levels. To examine associations between various factors and knowledge, attitude, and practice levels, chi-square tests were conducted, with p values less than 0.05 considered statistically significant. Data analysis was performed using "Jamovi 2.5.3".

RESULTS

Among the 200 study participants, 38 were lost to follow up and the allocation of study subjects and demographics is shown below in figure 1. A total number of 162 patients were analysed during the study. The age distribution shows that the majority of patients (37.7%) were between 21-25 years old, followed by 29.0% in the 26-30 age range.

A quarter (25.3%) were 20 years or younger, while only 8.0% were over 30. Regarding BMI, most patients (67.3%) fell within the normal weight range, while 23.5% were overweight. Only a small percentage were underweight (7.4%) or obese (1.9%). Education levels were relatively high, with 68.5% of patients being graduates, 22.2% having completed Plus Two, and 8.6% having SSLC. Only one patient (0.6%) had post-graduate education. In terms of occupation, the majority (59.3%) were unemployed, while 40.7% were private employees. Marital status showed that 58.0% were unmarried and 42.0% were married. The vast majority of patients (94.4%) followed a mixed diet, with only 5.6% being vegetarian.

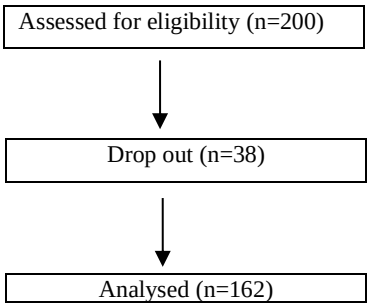

Figure 1: Allocation of drop out subjects.

Regarding family history, 30.2% of patients reported a family history of PCOS, while 69.8% did not. Both medical history and medication history showed identical results, with 19.8% of patients having a relevant medical history and being on medication, while 80.2% did not. Menstrual irregularity, a hallmark of PCOS, was reported by a significant majority (91.4%) of patients, with only 8.6% having regular cycles. The marital status distribution matched the previous table, with 42.0% married and 58.0% unmarried. Medication adherence varied among patients: 41.4% showed medium adherence, 35.8% demonstrated high adherence, and 22.8% had low adherence (Table 1). This information provides valuable context about the patients' medical backgrounds and their approach to managing their condition.

Distribution of knowledge, attitude, and practice scores

Among 162 PCOS patients, knowledge score had a mean of 8.33 with a standard deviation of 1.53, ranging from 3 to 10. The median score was 9, with an interquartile range (IQR) of 8 to 9. This suggests that most patients had a good level of knowledge about PCOS. The attitude score showed a mean of 8.43 with a higher standard deviation of 2.49, ranging from 2 to 12. The median attitude score was 9, with an IQR of 7 to 10, indicating generally positive attitude towards PCOS management. The practice score had a lower mean of 6.52 with a standard deviation of 2.15, ranging from 1 to 10. The median practice score was 7, with an IQR of 5 to 8, suggesting that while practice was generally good, there was more variation and room for improvement compared to knowledge and attitude (Table 2).

Table 1: Distribution of patients based on demographics.

S. no.	Demographic details		Number (n=162) (%)
1.	Age group (years)	≤20	41 (25.3)
		21-25	61 (37.7)
		26-30	47 (29.0)
		>30	13 (8.0)
2.	BMI	Under weight	12 (7.4)
		Normal	109 (67.3)
		Over weight	38 (23.5)
		Obese	3 (1.9)
3.	Education	SSLC	14 (8.6)
		Plus, two	36 (22.2)
		Graduate	111 (68.5)
		Post graduate	1 (0.6)
4.	Occupation	Employee	66 (40.7)
		Unemployed	96 (59.3)
5.	Marital status	Married	66 (40.7)
		Unmarried	96 (59.3)
6.	Diet	Mixed	153 (94.4)
		Vege	9 (5.6)
7.	Family history	Yes	113 (69.8)
		No	49 (30.2)
8.	Medical history	Yes	130 (80.2)
		No	32 (19.8)
9.	Medication history	Yes	130 (80.2)
		No	32 (19.8)
10.	Menstrual history	Regular	148 (91.4)
		Irregular	14 (8.6)

Table 2: Knowledge, attitude, and practice scores.

Score	N	Mean±SD	Range	Median	IQR
Knowledge	162	8.33±1.53	3-10	9	8-9
Attitude	162	8.43±2.49	2-12	9	7-10
Practice	162	6.52±2.15	1-10	7	5-8

Distribution of knowledge, attitude and practice levels

Regarding knowledge, an overwhelming majority (85.8%) of patients demonstrated good knowledge about PCOS, while 13.0% had average knowledge, and only 1.2% showed poor knowledge. For attitude, 69.8% of patients had good attitude towards PCOS management, 25.3% had average attitude, and 4.9% showed poor attitude.

The practice levels were more evenly distributed, with 53.7% of patients exhibiting good practice, 34.0% showing average practice, and 12.3% demonstrating poor practice (Table 3). These results indicate that while most patients have good knowledge and attitude regarding PCOS, there's a notable gap when it comes to implementing good practice, suggesting a potential area for intervention in PCOS management.

Table 3: Distribution of knowledge, attitude and practice levels.

Levels	Frequency (%)
Knowledge	
Poor	2 (1.2)
Average	21 (13.0)
Good	139 (85.8)
Attitude	
Poor	8 (4.9)
Average	41 (25.3)
Good	113 (69.8)
Practice	
Poor	20 (12.3)
Average	55 (34.0)
Good	87 (53.7)

Attitude shows a highly significant association with knowledge levels with p<0.001(Table 4)). There's a clear trend: as knowledge improves, attitude tend to improve as well. 80.6% of those with good knowledge also had good attitude, while all patients with poor knowledge had poor attitude. Practice also shows a highly significant association with knowledge levels (p<0.001). Similar to attitude, there's a clear trend of better practice associated with better knowledge. 61.2% of those with good knowledge demonstrated good practice, while all patients with poor knowledge had poor practice (Table 5).

This shows a highly significant association (p<0.001). Among those with good attitude (69.8% of the sample), 73.5% (83/113) also demonstrated good practice. Conversely, among those with poor attitude (4.9% of the sample), 87.5% (7/8) showed poor practice. This strong correlation underscores the importance of attitude in PCOS management (Table 6).

This study examined medication adherence among 162 PCOS patients across different age groups. The patients were categorized into four age groups: 15-20 years (25.3% of the sample), 21-25 years (37.7%), 26-30 years (29.0%), and 31-35 years (8.0%). Overall, 35.8% of patients showed high adherence, 41.4% medium adherence, and 22.8% low adherence to their medications. The 21-25 years age group, which was the largest, demonstrated 32.8% high adherence, 42.6% medium adherence, and 24.6% low adherence. Interestingly, the youngest age group (15-20 years) had the highest proportion of high adherence at 41.5%, while the oldest age group (31-35 years) had the lowest proportion of low adherence at 15.4%. However, it's important to note that the chi-square test ($\chi^2 = 1.345$) and p-value (0.969) indicate no statistically significant association between age groups and medication adherence levels (Table 7). This suggests that age may not be a determining factor in medication adherence among PCOS patients. The consistent pattern of medium adherence being the most common across all age groups (ranging from 36.6% to 46.2%) implies that interventions to improve medication adherence might need to target all age groups equally, rather than focusing on specific age ranges.

Table 4: Association between knowledge towards PCOS and attitude.

Attitude towards PCOS	Knowledge towards PCOS Frequency (%)			Total (n=162)	χ^2	P value
	Poor	Moderate	Good			
Poor	2 (100.0)	6 (28.6)	0 (0.0)	8 (4.9)		
Moderate	0 (0.0)	14 (66.7)	27 (19.4)	41 (25.3)	100.26	<0.001
Good	0 (0.0)	1 (4.8)	112 (80.6)	113 (69.8)		

Table 5: Association between knowledge towards PCOS and practice.

Practice level towards PCOS	Knowledge towards PCOS, frequency (%)			Total (n=162)	χ^2	P value
	Poor	Moderate	Good			
Poor	2 (100.0)	10 (47.6)	8 (5.8)	20 (12.3)		
Moderate	0 (0.0)	9 (42.9)	46 (33.1)	55 (34.0)	49.84	<0.001
Good	0 (0.0)	2 (9.5)	85 (61.2)	87 (53.7)		

Table 6: Association between attitude towards PCOS and practice.

Practice level towards PCOS	Attitude towards PCOS, frequency (%)			Total (n=162)	χ^2	P value
	Poor	Moderate	Good			
Poor	7 (87.5)	13 (31.7)	0 (0.0)	20 (12.3)		
Average	1 (12.5)	24 (58.5)	30 (26.5)	55 (34.0)	100.45	<0.001
Good	0 (0.0)	4 (9.8)	83 (73.5)	87 (53.7)		

Table 7: Medication adherence.

Age (in years)	Medication adherence			Total (n=162)	χ^2	P value
	Low (n=37)	Medium (n=67)	High (n=58)			
15-20	9 (24.3%)	15 (22.4%)	17 (29.3%)	41 (25.3%)		
21-25	15 (40.5%)	26 (38.8%)	20 (34.5%)	61 (37.7%)		
26-30	11 (29.7%)	20 (29.9%)	16 (27.6%)	47 (29%)	1.345	0.969
31-35	2 (5.4%)	6 (9%)	5 (8.6%)	13 (8%)		

DISCUSSION

This study aimed to assess the knowledge, attitude, and practice (KAP) regarding polycystic ovarian syndrome (PCOS) among PCOS patients in south Kerala, India. The research also sought to determine adherence to prescribed drugs among these patients. The study involved 162 PCOS patients and collected a wide range of demographic and medical information, along with KAP scores.

The demographic profile of the participants revealed that the majority (37.7%) were between 21-25 years old, with a mean age of 23.83 years. Most patients (67.3%) had a normal BMI, with an average BMI of 23.04. Education levels were relatively high, with 68.5% of patients being graduates. Interestingly, more than half of the patients (59.3%) were unemployed, and 58.0% were unmarried. The vast majority (94.4%) followed a mixed diet. Regarding medical history, 30.2% of patients reported a family history of PCOS, while 19.8% had a relevant medical history and were on medication. A striking 91.4% of patients experienced irregular menstrual cycles, a hallmark symptom of PCOS. This high prevalence of menstrual irregularity underscores the significant impact of PCOS on reproductive health.

The study's findings on knowledge, attitude, and practice levels were particularly insightful. Knowledge scores were generally high, with a mean of 8.33 out of 10, and 85.8% of patients demonstrating good knowledge about PCOS. In a recent study conducted by Ruba M et al 89% of study population were aware of PCOS. Another study conducted in central India showed less satisfying a smaller number of subjects that were aware of PCOS (41%).[20,21] We found that the study population had a positive attitude towards PCOS, with a mean of 8.43 out of 12, and 69.8% of patients. The studies in attitude of the population towards PCOS was found to be less. In contrast to this study, the study conducted in Pakistan in PCOS patients resulted a negative attitude towards PCOS.[22] Practice scores, however, were lower, with a mean of 6.52 out of 10, and only 53.7% exhibiting good practice. This discrepancy between knowledge/attitude and practice suggests a gap in translating understanding into action, which could be a key area for intervention in PCOS management. The study found significant associations between knowledge levels and several factors. Age and education were significantly associated with knowledge, with higher education levels correlating with better knowledge. This finding was correlated with other studies in Jordan and Saudi Arabia, which explain the positive relationship between education level and knowledge of PCOS.[23,24] When comparing with another study, the authors reported high level of PCOS knowledge in women after diagnosing PCOS than before diagnosis.[25] Importantly, there were strong positive associations between knowledge and both attitude and practice levels. Attitude levels were significantly associated with education, with higher education levels correlating with more positive attitude. There was also a strong positive association between attitude and practice levels. Findings of recent study showed, there was a statically significant association between attitude and knowledge towards PCOS.[26] This highlights the importance of education in shaping both understanding and approach to PCOS management. Interestingly, practice levels did not show statistically significant associations with any of the demographic or medical history factors examined. This suggests that other factors, possibly including knowledge and attitude, may play a more significant role in determining practice levels among PCOS patients.

These findings have important implications for PCOS management and patient education. The high levels of knowledge and positive attitudes among patients suggest that current educational efforts are effective to some extent. However, the lower practice scores indicate a need for strategies to help patients translate their knowledge into action. This could involve more practical, hands-on education about lifestyle modifications, medication adherence, and symptom management.

The strong associations between knowledge, attitude and practice underscore the importance of comprehensive patient education in PCOS management. Improving patient's understanding of PCOS could lead to more positive attitude and better management practices. The lack of significant associations between demographic factors and practice levels suggests that PCOS management challenges may be universal across different patient groups.

The study also examined medication adherence across different age groups. Overall, 35.8% of patients showed high adherence, 41.4% medium adherence, and 22.8% low adherence to their medications. Notably, there was no statistically significant association between age groups and medication adherence levels. This suggests that age may not be a determining factor in medication adherence

among PCOS patients and interventions to improve adherence might need to target all age groups equally. These findings indicate that interventions to improve adherence should target all age groups. At present, there is no study to compare the medication adherence of PCOS.

CONCLUSION

PCOS is a common and unrecognized condition. Therefore, assessing the knowledge, attitude, and practice towards PCOS is important. The presents study provides variable insights into the knowledge, attitude and practice towards PCOS among PCOS patients, offers guidance and resource for the future study. The study findings revealed there was significant association between demographic characteristics and knowledge (education) as well as demographic characteristics and attitude. There is no significant association between demographic characteristics and practice. This highlights the need for individualized approaches to patient care, considering each patient's unique circumstances and barriers to good practice. There were strong positive associations between knowledge and both attitude and practice levels. In this study, improving patient's understanding of PCOS could lead to more positive attitudes and better management practice. Healthcare providers should focus on delivering clear, accurate information about PCOS, its long-term implications, and effective management strategies. The result of medication adherence showed no statistically significant association between age groups and medication adherence levels. Strategies could include simplified medication regimens, reminders, and educating patients about the importance of consistent medication use in managing PCOS.

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