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A STUDY TO ASSESS THE KNOWLEDGE AND PREVALENCE OF POLYCYSTIC OVARIAN SYNDROME (PCOS) AMONG YOUNG WOMEN

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ABSTRACT

Polycystic ovarian syndrome (PCOS) is a hormonal disorder which is characterized by elevated androgen level which leads to enlarging ovaries with small cysts on the outer edge. The main reason of PCOS involves both environment and genetic factors. PCOS shows main symptoms of irregular menses, hyperandrogenism and polycystic ovaries. During the early puberty years symptoms of PCOS arise. Type 2 diabetes, Thyroid disease and gestational diabetes are the main risk factors of PCOS. The objective of the study is to determine the prevalence of PCOS and provide self-education among young women. This is a cross-sectional study on polycystic ovarian syndrome (PCOS) among young women in Bangalore, carried out for a period of 6 months from November 2020- April 2021. The Participants have provided the responses using google form and the data on demographic details, lifestyle modification and knowledge regarding PCOS were collected. Informed consent was obtained from all the participants. The subjects were provided with the link of the questionnaire, which comprised of 4 sections. The study includes 400 participants, and the prevalence of PCOS among young women was found to be 29%. And it was found that knowledge regarding PCOS among the participants where increased by 28.8% after the health education. Globally, prevalence of PCOS estimates to be higher because of life style changes. Due to lack of awareness many women are facing PCOS

and its future complications. So, this is an informative study which can serve the purpose of providing detailed information about PCOS.

KEYWORDS: Polycystic ovarian syndrome, Knowledge regarding PCOS, Risk factors, Prevalence.

1. INTRODUCTION

Polycystic ovarian syndrome (PCOS) also known as Stein-Leventhal Syndrome is a hormonal disorder which is characterized by elevated androgen levels.[1] The condition was first described in 1935 by American gynecologist Irving Stein and Michael Leventhal, from this it is called Stein –Leventhal syndrome. Other names for this syndrome include Polycystic ovary disease (PCOD), functional ovarian hyperandrogenism, Ovarian hyperthecosis, sclerocystic ovary syndrome. PCOS is the most common endocrine disorder among women between the age group of 18-44years. It affects approximately 2% to 20% of this age group.[1]The World Health Organization (WHO) estimates that it affects 116 million women worldwide ie. 3.4% of women. PCOS is a hormonal disorder characterized by the enlarged ovaries with small cysts on the outer edge. The causes of PCOS involve both environment and genetic factors. The symptoms of PCOS are irregular menses, hyperandrogenism and polycystic ovaries. The symptoms of PCOS arise usually during the early puberty years. Almost 50-70% of women with PCOS suffer from the insulin resistance, which leads to the various health problems like metabolic syndrome, hypertension, dyslipidemia, glucose intolerance and diabetes. Globally, prevalence of PCOS estimates to be highly variable ranging from 2.2% to as highest 26%. Community-based studies among reproductive age group women using Rotterdam criteria have demonstrated varied prevalence figures in few Asian countries ranging from 2% to 7.5% in China to 6.3% in Sri Lanka. Studies carried out among several Caucasian population using NIH criteria reported PCOS in the range of 5-8%. A retrospective birth cohort study in Australia of 728 women reported a prevalence of 11.9 ± 2.4% as per Rotterdam criteria, which increased to 17.8 ± 2.8% when imputed data were included. Although there are finite studies of PCOS in India, the observational studies by gynecologists, dermatologists and endocrinologists relate to various aspects of PCOS. Most prevalence studies of PCOS in India are in hospitals and recently a few studies among adolescents in schools recorded prevalence of PCOS as 9.13% to 36%.[2] The most common PCOS symptoms are irregular Periods, menorrhagia, hirsutism, acne, weight gain, metabolic syndrome and recurrent miscarriage.[1]

The main risk factors of PCOS include dermatologic, metabolic, reproductive, oncologic and psychological aberrations. PCOS and its risk factors reduce patient quality of life.[3] Also women with PCOS are high risk for endometrial hyperplasia and endometrial cancer, insulin resistance and type II diabetes mellitus, hypertension, depression, dyslipidemia, cerebrovascular stroke, weight gain, sleep apnea, non- alcoholic fatty liver disease and autoimmune thyroiditis. Family history plays an important role in developing PCOS. PCOS patients must follow a good healthy diet to reduce body weight abdominal weight, improve insulin resistance and decrease hirsutism.[4] Infertility is the early-term complication of PCOS. Evidences shows that PCOS is the most common reason for oligo-anovulation and ovulatory problems which leads to infertility. Obesity and insulin resistance are the main two factors which increase the chance of reduced pregnancy and abortion. The most commonly seen pregnancy complication is gestational diabetes mellitus [GDM]. Non classic risk factors are C- reactive protein (CRP), homocysteine and tumor necrosis factor.[5]

2. METHODOLOGY

STUDY DESIGN

A cross-sectional study on the prevalence of polycystic ovarian syndrome among young women was conducted which focuses on questionnaire based on assessment as well as providing education.

SITE OF STUDY

The study was conducted in PES College of Pharmacy Bengaluru, various girls hostels and PGs in Bengaluru.

STUDY DURATION

Study was conducted for a period of 6 months between November 2020 and April 2021.

• INCLUSION CRITERIA

Female participants of age between 18-30 years those who attained menarche at least four years before the start of the study and who were willing to give consent.

• EXCLUSION CRITERIA

Female participants above the age of 30 and below 18 and who were not willing to participate in the study.

SOURCE OF DATA

Questionnaires used for the study was created as Google form that comprised of four sections. The first section consists of data regarding socio-demographic characteristics. The second section consists of detailed menstrual history and clinical evaluation of symptoms, while the third section consists of pre-form to evaluate the knowledge regarding PCOS. After pre-form, a self-designed leaflet, this provides information about PCOS. And the fourth section consists of post-form.

SAMPLE SIZE CALCULATION

The sample size was estimated to be 400, using the formula

$n = \frac{\{z-1\left(\frac{\alpha}{2}\right)^2 p(1-p)}{d^2}$ (With a confidence interval of 95%)

DATA COLLECTION PROCEDURE

The study participants of the study were approached and briefed about the study, its purpose, and the benefits of participating in the study and assured confidentiality and privacy about their response in survey and personal information. Data were collected using well-structured questionnaire, circulated to the participants through a link. Informed consent was obtained from all the participants through a question in Google form. The participants were requested to fill the form carefully after reading each question and also to read the leaflet provided before filling the post- form.

ETHICAL CONSIDERATION

The study has been approved by ethical research committee from Department of Pharmacy Practice, PES College of Pharmacy, Bangalore. Written consent was taken from every participant prior to the study**.**

STATISTICAL ANALYSIS

The data collected from questionnaires (Google form) was statistically analyzed using Microsoft Excel. Analysis was carried out using SPSS software version 22. Pearson chi-square test was used to identify the significance among pre-form and post-form. The questions which had a p- value less than 0.05 were considered statistically significant.

RESULTS

A total of 412 responses were obtained, in which 12 responses were excluded due to incomplete data. Hence the data of 400 participants was available for the data analysis.

1. Demographics characteristics

Majority of the respondents 202 (50.5%) were belonging to the age ranging between 22-25 years. The mean body weight of the study participants was found to be 55.24±10.59 kg. The mean age of the study participants were found to be 22.14±2.5years. Most of the study participants were single (355, 88.75%).

Table no. 1: Demographics characteristics of the study participants.

DEMOGRAPHIC CHARACTERISTICS	FREQUENCY (%)
AGE	
18-21 Years	160 (40%)
22-25 Years	202 (50.5%)
26-30 Years	38 (9.5%)
BMI (Body Mass Index)	
Normal	250 (62.5%)
Underweight	81 (20.25%)
Over weight	58(14.5%)
Obese	11 (2.75%)
MARITAL STATUS	
Single	355 (88.75%)
Married	45 (11.25%)

2. LIFESTYLE CHARACTERISTICS

Lifestyle characteristics are shown in Table no 2. Majority of respondents 343(85.75%) were non- vegetarian, 200(50%) were having junk foods monthly once and 183 (45.75%) exercise once or twice weekly.

Table no. 2: Lifestyle characteristics of the study participants.

LIFESTYLE	FREQUENCY (%)
DIET	
Vegetarian	57 (14.25%)
Non-vegetarian	343 (85.75%)
CONSUMPTION OF JUNK FOOD	
Daily once	42 (10.5%)
Weekly once	158 (39.5%)
Monthly once	200 (50%)
EXERCISE	
On daily basis	74 (18.5%)
Once or twice a week	183 (45.75%)
Never Exercise	143 (35.75%)

CLINICAL EVALUATION OF PCOS

Clinical evaluation of PCOS is given in Table no 3 The participants, who were already diagnosed with PCOS (92, 23%), family history of PCOS (30, 7.5%), irregular or absence of periods (139, 34.75%), heavy periods (92,23%), prolonged periods (46, 11.5%), delay in periods (173, 43.25%), continuous abnormal weight gain (53, 13.25%), acne problem (243, 60.75%), unwanted amount of hair growth at different body parts(chin, abdomen, thighs etc.) (120, 30%), unusual amount of scalp hair loss (197, 4 9.25%), discoloration or dark patches on skin (107, 26.75%).

Table no. 3: Clinical evaluation of PCOS.

QUESTIONS	YES	NO	DON'T KNOW
Have you ever beingdiagnosed with PCOS?	92 (23%)	308 (77%)	Nil
Do you have familyhistory of PCOS?	30 (7.5%)	298 (74.5%)	72 (18%)
Do you irregular orabsence of periods?	139 (34.75%)	261 (65.25%)	Nil
Do you have heavyperiods?	92 (23%)	292 (73%)	16 (4%)
Do you have prolonged periods?	46 (11.5%)	346 (86.5%)	8 (2%)
Do you experiencedelay in periods?	173 (43.25%)	219 (54.75%)	8 (2%)
Do you have continuous abnormal weight gain?	53 (13.25%)	317 (79.25%)	30 (7.5%)
Do you have acneproblem?	243 (60.75%)	157 (39.25%)	Nil
Do you have unusualamount of hair growth?(upper lips, chin, thighs, chest, abdomen)	120 (30%)	280 (70%)	Nil
Do you experienceunusual amount of hair loss?	197 (49.25%)	167 (41.75%)	36 (9%)
Do you have discoloration or dark patches on skin?	107 (26.75%)	259 (64.75%)	34 (8.5%)

4. DIAGNOSIS OF PCOS

Diagnosis of PCOS is elaborated in table 3. 116 (29%) were suspected on the basis of sign and symptoms and 92 (23%) were already diagnosed with PCOS.

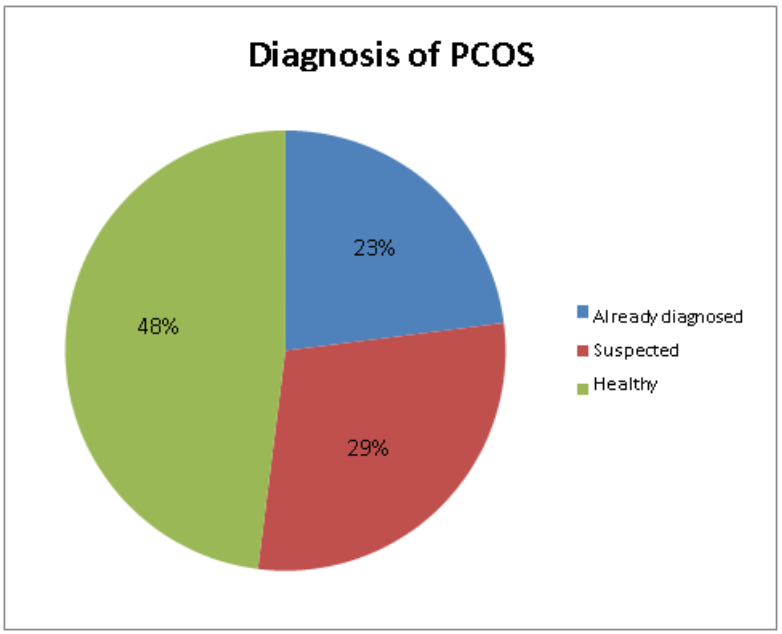

Fig.1: Diagnosis of PCOS.

5. KNOWLEDGE REGARDING PCOS

Before the study, it was found that knowledge regarding PCOS among the participants was 49.9%. After the educational intervention, the knowledge was increased to 78.7%. Hence, our health education intervention was able to increase the knowledge by 28.8%.

Table no. 4: Knowledge regarding PCOS.

QUESTIONS	PRE-TEST NO:	PERCENTAGE %	POST -TEST NO:	PERCENTAGE %	P VALUE
Have you heard about the term PCOS?	Yes – 310 No – 78 Don't know – 12	77.5 % 19.5%3 %	Yes – 366 No – 25 Don't know - 9	91.5 % 6.25 % 2.25 %	.00001*
Have you heardabout androgen (male) hormone (Eg: testosterone)?	Yes – 326 No – 48 Don't know -26	81.5%12 % 6.5 %	Yes -360 No – 23 Don't know – 17	90 % 5.75 % 4.25 %	.000254 *
Do you think that inPCOS there is an increased level of androgen hormone?	Yes – 171 No – 79 Don't know -150	42.75% 19.75% 37.5 %	Yes – 320 No – 39 Don't know – 41	80 % 9.75 % 10.25 %	.00001*
Do you think that patients sufferingfrom PCOS have small cysts in the ovaries?	Yes – 235 No – 62 Don't know -103	58.75 % 15.5 % 25.75 %	Yes – 379 No – 21 Don't know - 0	94.75 % 5.25%0	.00001*
Do you think that PCOS may lead to infertility (inability to have children)?	Yes – 227 No – 76 Don't know – 97	56.7% 19 % 24.25 %	Yes – 308 No – 56 Don't know - 36	77 % 14 % 9 %	.00001*
Do you think that obesity may cause PCOS?	Yes – 201 No – 77 Don't know-122	50.25 % 19.25 % 30.5 %	Yes – 310 No – 49 Don't know - 41	77.5 % 12.25 % 10.25 %	.00001*

Do you think that irregular / absence of periods is a symptom of PCOS ?	Yes – 264 No – 47 Don't know – 89	66 % 11.75 % 22.25 %	Yes – 340 No – 28 Don't know - 32	85 % 7 % 8 %	.00001*
Do you think that acne(pimples) Problem is a symptom of PCOS ?	Yes – 139 No – 131 Don't know – 130	34.75 % 32.75 % 32.5 %	Yes – 316 No – 44 Don't know - 40	79 % 11 % 10 %	.00001*
Do you think that excessive hairgrowth on different parts of the body may cause PCOS?	Yes – 199 No – 76 Don't know – 125	49.75% 19% 31.25 %	Yes – 325 No – 37 Don't know - 38	81.25 % 9.25 % 9.5 %	.00001*
Do you think that hair loss is a symptom of PCOS ?	Yes -149 No – 120 Don't know – 131	37.25% 30% 32.75 %	Yes – 283 No – 64 Don't know–53	70.75% 16% 13.25 %	.00001*
Do you think that PCOS may lead to diabetes?	Yes – 103 No – 112 Don't know – 185	25.75% 28% 46.25 %	Yes – 269 No – 73 Don't know – 58	67.25 % 18.25 % 14.5 %	.00001*
Do you think that PCOS may lead toanxiety or depression?	Yes – 212 No – 63 Don't know – 125	53 % 15.75 % 31.25 %	Yes – 318 No – 40 Don't know – 42	79.5 %10 % 10.5 %	.00001*
Do you think thatPCOS may lead to heart disease?	Yes – 81 No – 143 Don't know – 176	20.25 % 35.75% 44%	Yes – 218 No – 115 Don't know – 67	54.5 % 28.75 % 16.75 %	.00001*
Do you think that symptomatic treatment may giverelief to the symptom of PCOS?	Yes – 202 No – 58 Don't know – 140	50.5 % 14.5 %35 %	Yes – 302 No – 38 Don't know – 60	75.5 % 9.5 %15 %	.00001*

DISCUSSION

Polycystic ovarian syndrome (PCOS) is a hormonal disorder which affects women of reproductive age (18-44 years).It affects approximately 2%-26% of this age group.[2] Due to the PCOS, women may develop complications related to their fertility.

Since our study obtained responses from student and working women belonging to age group 18-30 years, while most of them were students (78.25%). Our PIL was effective in delivering quality health information to the study participants.

In the current study, the mean age of the participants was 22.14±2.5years. Comparable cross-sectional study was carried out by Beena Joshi et al. in Mumbai, India, had participants with the mean age of 18.15 ±2.4 years.[2]Another cross-sectional study conducted by Mahesh Gupta et al. in Bhopal city, found the mean age of the study group to be 18.8 years[Table no:1].[7]

Average BMI of the participants was found to be 22.33kg/m² which are close to a cross-sectional study carried out by Mukherjee S et al. in Mumbai, India (23.3kg/m²).[2] Among those diagnosed with PCOS, 12.25 % participants were overweight and 2.25 % were obese. A study by Beena Joshi et al found out that 7.5 % participants were overweight and 20.7 % were obese.[2]

A study by Mahesh Gupta et al showed a statistically significant association between the BMI of the study subject and the occurrence of PCOS.[10] According to this study, 14.5% of the subjects were overweight and 2.75% were obese. A study about prevalence and knowledge of PCOS among female science students of universities of Quetta, Pakistan by Noman Ul Haq et al showed that 8% participants were found overweight and 3% subjects were obese with and without PCOS [Table no:1].[20]

Another study on obesity and the polycystic ovary syndrome by A Gambineri et al. reported that 50% of PCOS women were overweight or obese.[21] A cross-sectional study by P Rajakumari et al. revealed that 28% girls were found to be overweight while 8% girls were obese.[12]

Lifestyle changes have influenced the prevalence of PCOS. Lack of exercise and consumption of junk food play a major role in prevalence of PCOS.[12] Various lifestyle modifications like exercise and dietary modification may be required to achieve better weight management [Table no: 2]

Most of respondents answered negative to all clinical parameters for diagnosis. Majority of the women 60.75% are facing acne problem and 30% are struggling with unusual amount of hair growth and 34.75% had menstrual irregularities. While a study by Patel J et al. revealed that 75.5% had acne 13% are struggling with excess hair growth over face and abdomen.[9]

Rotterdam criteria were used as a diagnostic tool for PCOS. According to the criteria, the participants presenting with at least two of the three findings are included in the suspected criteria which are hyperandrogenism, irregular or absence of periods and abnormal cysts in the ovary. Acne, hair loss and unusual amount of hair growth are considered to be the symptoms of hyperandrogenism.[20]In this study 34.75% of the participants was having irregular or absence of periods, acne (60.75%), hair loss (49.25%) and unusual amount of hair growth on the upper lip, chin, thighs etc. (30%)[Table no:3].

In the present study, the prevalence of PCOS was found to be 29%, which was consistent with results of the study by Manisha Rao, et al. where the prevalence was found to be 28.5%.[3] In another cross-sectional study conducted among adolescent and young girls in Mumbai by Beena Joshi, et al., the prevalence was found to be 22.5% using Rotterdam criteria[Fig.1].[2]

In this study, it was found that 23% of the participants were already diagnosed with PCOS. Among those diagnosed with PCOS ,13.5 % were in the age group of 18-21 years and 11.25% were in the age group of 22-25 years, which is similar to the study conducted by Beena Joshi et al. showed that 22.5 % young girls with PCOS are in the age group of 15-24 years.[2] Similar cross- sectional study was conducted among female science students of different public universities of Quetta by Noman Ul Haq, in which the percentage was 5.5%.[20]

The current study showed that half of the participants (49.8%) were aware of PCOS and its signs and symptoms before educational intervention. A study conducted among young women in Bhopal by Gupta M et al. showed that only 21.6% of girls were aware of PCOS[7] .After educational intervention, the awareness about PCOS was increased by 28.8%. In another research conducted in Indore city by Patel J and Rai S was found to be 58.53% [Table no: 5].[9]

Awareness and proper diagnosis is the initial step in managing the PCOS, as it improves quality of life. Bringing awareness about PCOS may cause significant change in the prevalence of PCOS. The symptom of PCOS arises during the early years of puberty.Regular checkup helps in the early screening of PCOS. Women should not ignore symptoms such as pelvic pain, irregular periods, unexpected weight gain, excessive facial hair growth and delay in pregnancy as these are the important symptoms of PCOS. Poor management of PCOS may lead to infertility, obesity, diabetes, dermatological symptoms and mood disorders such as anxiety, depression, eating disorders.[2] Thus, educating adolescent girls is essential. In rural setup, awareness regarding PCOS is very low. Doctors and health staffs need to play a prime position in spreading consciousness of the entity to save the long term complications. So, circulating leaflet which includes PCOS signs and symptoms, causes, risk factors and consequences with the help of pictogram can make a significant change in the knowledge and approach towards the disease condition.

Sedentary life-style, access to high calorie food and machineries for all residence work has been attributed to the better occurrence of PCOS among higher socio-financial city population in India. September is considered as PCOS awareness month, this month is dedicated to increasing awareness, educating the general public, and conquering PCOS by sharing personal stories.

Health education is a process of gaining knowledge and skills in order to increase health of the individual and community. Leaflet are an excellent combination of written words and images hence they are more widely accepted. They are the best strategy for spreading information to the public. So in this study, patient information leaflet (PIL) is used as an educational aid. It consists of information about PCOS, its causes, symptoms, risk factors, myths and lifestyle modification. Simplified language and pictograms are used for the better understanding of the information. The text included in the leaflet is to the point, possibly pointed with headers, as this breaks up the text making it visually pleasing and easier to read. This aims to improve women's understanding about PCOS and related conditions, so they take a more active role in their health care.

The leaflet is designed with 100% understandability and 85% actionability. Readability is an important component to consider in the production of information leaflets. Following simple guidelines on the designing of leaflets for patients significantly improves their quality. Readability was assessed using FRE (Flesch reading ease), FKGL (Flesch-Kincaid Grade Level), SMOG. Aiming for high readability develops the probability that the reader will clearly understand the contents.

The study emphasizes the need to evaluate the knowledge about PCOS among young women. The result obtained from the present study indicated that most of the women have inadequate knowledge about PCOS and its complications at baseline. Using PIL as an aid to provide health education had significantly improved the knowledge of women [Table No.4]. There was a significant improvement in the knowledge of the women at baseline (pre-form) to post health education session at $p<0.05$. [Table No.4]

Hence the current study was capable of bringing awareness about the PCOS, its signs and symptoms, risk factors and its complications. The need for the lifestyle modification for the better management of the condition was also emphasized. This may help the women in the early diagnosis of the health condition, thereby obtaining the appropriate management.

CONCLUSION

PCOS is a rising concern in the life of today's women. Globally, prevalence of PCOS estimates to be higher because of life style changes. The prevalence of PCOS in the current study was found to be 29% and health educational intervention was provided orally along with Patient information leaflet. After the health education the knowledge of women about PCOS has improved by 28.8%.

PCOS needs cautious evaluation, timely intervention and proper treatment. The educational system should consider incorporating appropriate information about the disease and its complications in the curriculum of the schools, which may bring awareness about the disease and the necessity to bring the life style amendment.

Factors such as limited health education, reluctance to know about menstruation and its related problems may lead to various health conditions. Thus, the study is an informative educational survey which can serve the purpose of providing detailed information about the PCOS.

Most of the women don't consult gynecologist unless there is severe problem or disease this results in further complications. So, it is essential to consult a gynecologist at least once in a year for their better health status.

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