

## Study of Relationship between Early Menarche and PCOS with Reference to Problems Associated and Its Awareness in the Community

**Mrs Arjumand Fatima** M.Sc. senior lecturer

**Miss Qudsiya Amreen** M.Sc. junior lecturer

Department of Applied Nutrition and Public health

The progress Degree College for Women

Falaknuma, Hyderabad India. 500053

### Abstract

**Objective:** To determine whether they exist any relationship between early menarche and polycystic ovarian syndrome. **Hypothesis:** There is a no significant relationship between late menarche and PCOS in girls aged between 18-21 years old. **Type of study:** survey type cross sectional studies carried out for a period of 3 months. **Sample size:** 100 samples of adult girls aged between 18-21 years. **Methodology:** Data was collected through a structured questionnaire, anthropometric measurements like height, weight, BMI, and waist hip ratio was calculated. Statistical tools like average mean, standard deviation and one sample t test was done to draw conclusion. Data obtained was interpreted by pie diagrams, bar graphs and tables. **Result :** The study was done on total 100 girls taken as sample, after screening it was found that out of 100 total 28 girls suffer from PCOS. Among the girls suffer from PCOS it was found that 68% of the girls attained their puberty at the age of 16 years and 32% at 15 years of age. T test was done and the critical t – value of +/- 2.51 is obtained, hence the null hypothesis was rejected. From the findings it was proved that girls who attained menarche during 15-16 years of age suffers from PCOS. Most of the problems faced by these girls were weight gain (46%) followed by hair loss (32%) and mood swings (21%). Coming to the awareness about the said syndrome it was discovered that majority of the people around 58% are not aware about PCOS and its symptoms, whereas 42% are literate about the syndrome and its symptoms.

Suggestions like balanced diet, active lifestyle and good sleep pattern following circadian rhythms are advised for prevention and management of the syndrome.

**Key words:** polycystic ovarian syndrome (PCOS), anthropometric measurement, Body mass index (BMI), obesity, precocious puberty, menarche, waist hip ratio, estrogen and, progesterone.

### Introduction

PCOS is nowadays one of the most common health problems affecting teenage girls and young women. According to WHO, 8-13% of women of reproductive age suffer from PCOS, and about 70% of cases go undiagnosed.

The cause remains unknown, but a family history is known to be one of the contributing factors, while a sedentary lifestyle combined with faulty eating habits and irregular sleep patterns play an important role as environmental factors. It is mostly related to hormonal disturbances. In the female body, the ovaries release sex hormones, namely estrogen, progesterone, and a small amount of testosterone. These hormones are responsible for the development of female sexual characteristics, menstrual cycles, conception, pregnancy, and labor.

Testosterone is normally a male sex hormone; however, the female body produces it in small amounts. But in girls suffering from PCOS, higher than normal levels of testosterone are produced in the body. These higher levels interfere with the development of the egg and its release during ovulation. Any disturbances in the normal cycle will lead to the formation of cysts in the ovaries, and because of these cysts, females might not ovulate and have irregular periods. It can only be diagnosed after 2-3 years of the first menstrual cycle because it takes 2 years for any girl's cycle to become regular.

Symptoms associated with PCOS include weight loss, abdominal obesity, extra hair growth on the face, chest, abdomen, and back, alopecia, severe acne, darkened and thickened skin around the neck, armpits, or breasts, and, most importantly, insulin resistance.

PCOS can be managed by a proper diet, exercise, and medications like birth control pills, anti-androgens, and metformin, which have been found to be effective. In the present study, an attempt has been made to study whether there exists any relation between the age of menarche and PCOS, and to create awareness in the community.

**Aims and objectives:**

**Aim:** - To study the relation between PCOS and Early menarche in young women aged 18-21 years old from Hyderabad, India.

**Hypothesis:** - There is a significant relation between early menarche and PCOS.

**Objectives:-**

- 1) Screening of girls suffering from PCOS from the sample taken.
- 2) Study if there exist any relationship between early menarche and PCOS.
- 3) Problems faced by girls suffering from PCOS.
- 4) Creating and awareness about PCOS, its symptoms, causes and management.

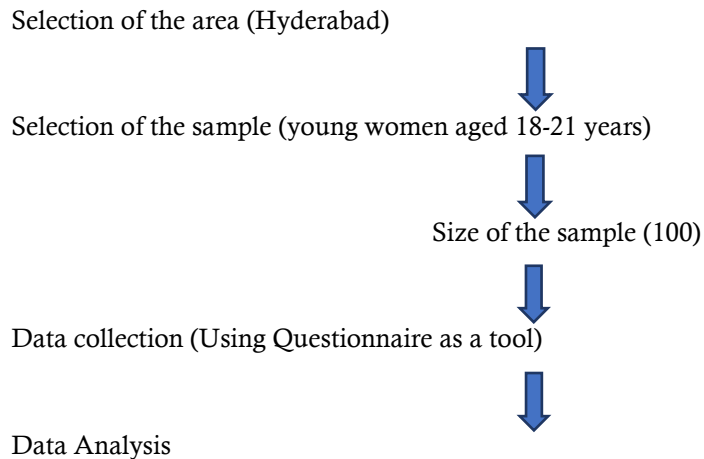
**Methodology:** Methodology is a significant part of any research study which gives research legitimacy and provides scientifically sound findings.

Methodology of the present study is discussed under the following heads.

- ✦ Research design
- ✦ Selection of area
- ✦ Size of sample
- ✦ Data collection
- ✦ Data analysis

This is a community-based cross-sectional study carried out over a period of three months from July to September 2023.

**Research Design:** Communicative study design of the study is in the following flow chart.



**Research approach:** Communicative Study

**Selection of Area:** Study was done in Hyderabad city from India.

**Selection of sample:** 100 samples from a reputed college going girls were collected. The girls were selected randomly. The survey was done under the supervision of the concerned college authorities, and it was completely student friendly. A small lecture was conducted before the data collection about the study to avoid any kinds of doubts and objectives was made clear to the girls.

**Duration of the study:** The school based cross-sectional studies has been carried out for a period of about three months i.e., July to September 2023

**Collection of Data:** The data was collected through a structured questionnaire which contains which contains questions related to age, height, weight, BMI, age of attainingmenarche, waist and hip ratio, common problems observed by the sufferers, and awareness about the syndrome and its symptoms.

BMI was used to define Overweight, Obese, Normal and Underweight.

Three types of questions were including:

- a) Yes/No
- b) Multiple choice questions
- c) Open ended questions

**Medium of language:** English

**Methodology:** Responses of the questions were evaluated by percentage average and mean, and one sample t-test along with standard deviation. The data obtained us presented in the form of tables, pie diagrams and histograms.

The investigation followed survey type of descriptive research.

**Results and discussions:** From the total samples collected, the data was compiled, and statistical analysis was done. The results obtained are discussed below.

Figure No. 1: Distribution of girls according to BMI

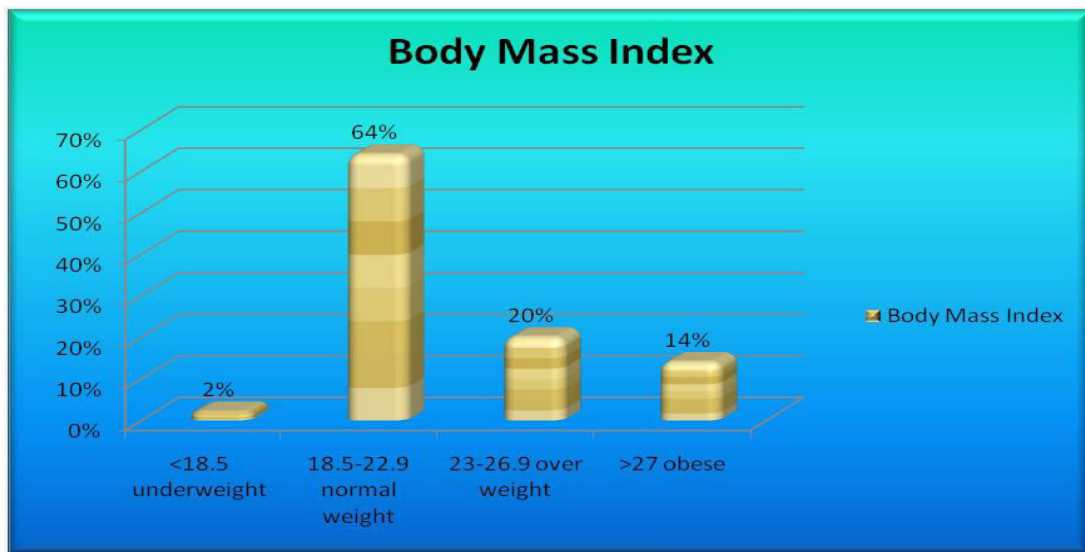


Figure No. 1: The above figure shows out of 100 samples 2% girls are underweight, 64% girls are normal weight, 20% girls are overweight, and 14% girls are obese.

Figure No. 2: Percentage of girls suffering from PCOS

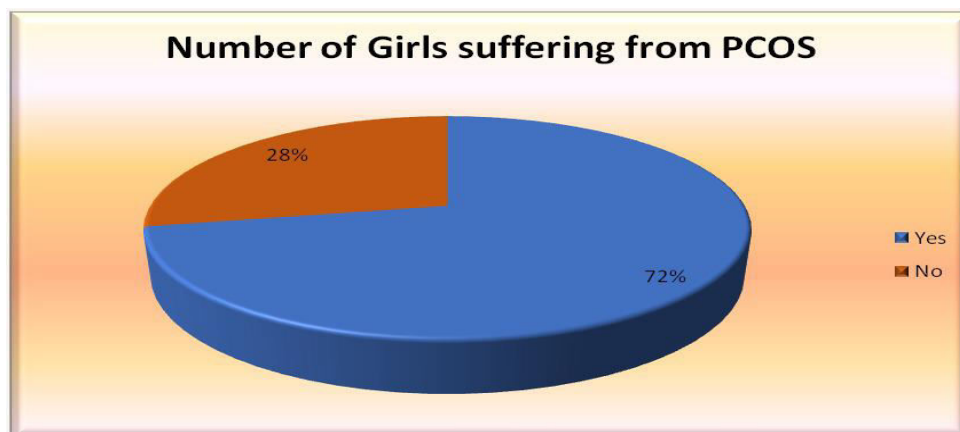
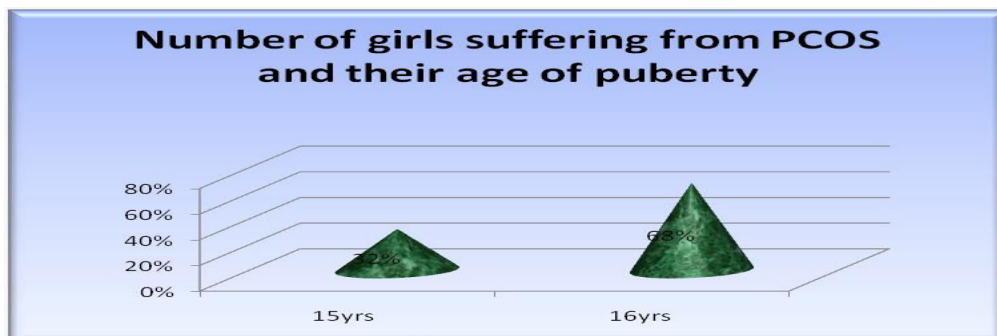


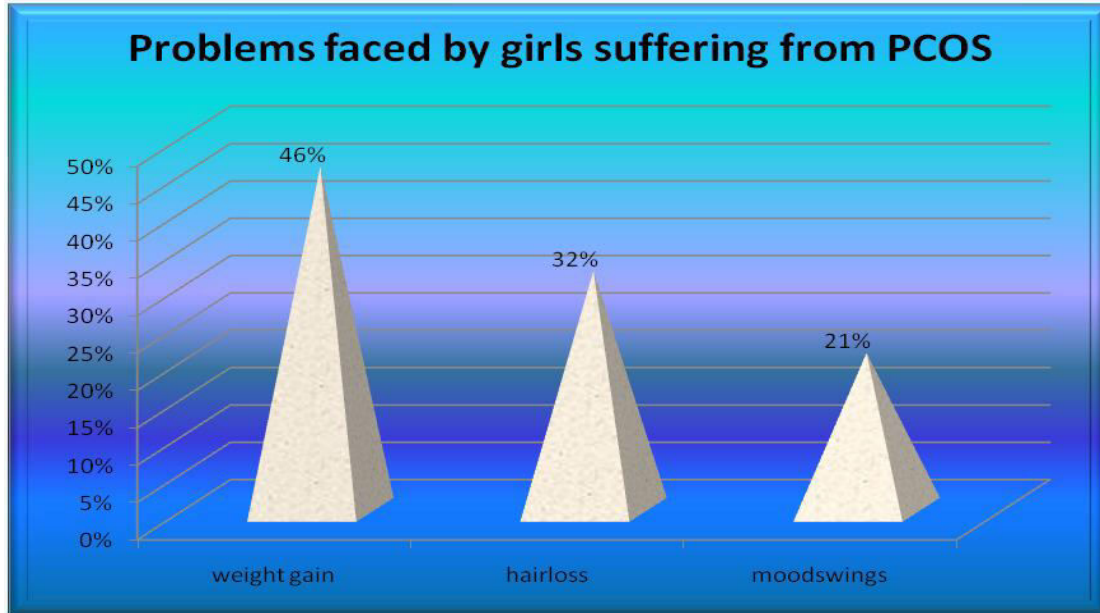
Figure No. 2: The above figure shows out of 100 samples, 28% of the girls are suffering from PCOS.

Figure No. 3: Number of girls suffering from PCOS and their age of puberty.



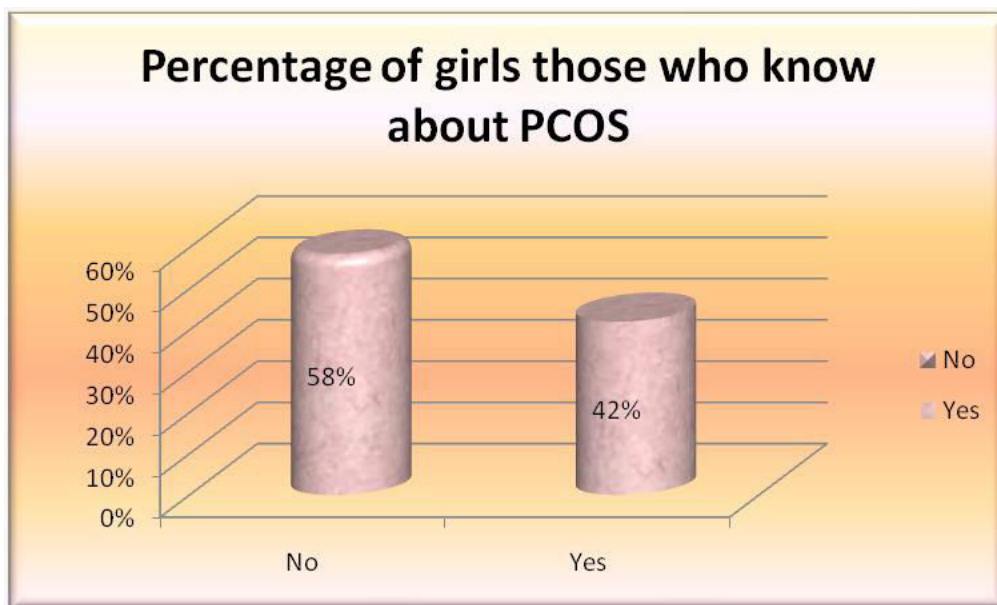
**Figure No. 3:** The above figure shows out of the screened samples suffering from PCOS, 32% of the girls attend puberty at 15yrs of age and 68% of the girls attend puberty at 16 years of age.

**Figure No. 4: Problems faced by girls suffering from PCOS.**



**Figure No. 4:** The above figure shows out of 100 girls 46% of the girls face weight gain, 32% of the girls face hair loss and 21% of the girls face mood swings, problems because of PCOS.

**Figure No. 5: Awareness about PCOS amongst girls.**



**Figure no: 5.** The above figure shows out of 100 samples 58% of the girls are unaware about PCOS, and 42% of the girls know about PCOS.

**Table No. 1: Distribution of samples based on age of menarche.**

S.No.	Age of Menarche	n- $\mu$
1	15	0.3
2	15	0.3
3	16	-1.3
4	14	-0.7
5	14	-0.7
6	16	-1.3
7	15	0.3
8	11	-3.7
9	15	0.3
10	16	1.3
11	12	-2.7
12	15	0.3
13	16	1.3
14	12	-2.7
15	15	0.3
16	13	-1.7
17	16	1.3
18	16	1.3
19	14	-0.7
20	16	-1.3
21	16	-1.3
22	16	-1.3
23	15	0.3
24	14	-0.7
25	15	0.3
26	16	-1.3
27	15	0.3
28	13	-1.7

From the above table, the following data was calculated.

**Standard Deviation, s: 1.4104672946999**

Count, N: 28  
 Sum,  $\Sigma x$ : 412  
 Mean,  $\bar{x}$ : 14.714285714286  
 Variance,  $s^2$ : 1.989417989418

**Steps**

$$s = \sqrt{\frac{1}{N - 1} \sum_{i=1}^N (x_i - \bar{x})^2},$$

$$s^2 = \frac{\Sigma(x_i - \bar{x})^2}{N - 1}$$

$$= \frac{(15 - 14.714285714286)^2 + \dots + (13 - 14.714285714286)^2}{28 - 1}$$

$$= \frac{53.714285714286}{27}$$

$$= 1.989417989418$$

$$s = \sqrt{1.989417989418}$$

$$= 1.4104672946999$$

Where: -  
 Hypothesized mean  $\mu = 1.03$   
 Standard mean  $X = 14.7$  years  
 Standard deviation = 1.410  
 t- statistic = 90.461  
 Degree of freedom = 27  
 Critical t-value (one tailed) = 1.703  
 Critical t- value = +/- 2.0518  
 With level of significance 5%.

The value obtained i.e +/- 2.015 is greater than 0.05%. Hence the null hypothesis is rejected. Therefore, from the above calculations and results it can be proved that girls who attained late menarche suffers from PCOS.

### **Summary and conclusion:**

According to AdreaIosefinaArcari et al “Hormone research in paediatrics August 8, 2023,adolescent girls. With a history of ICPP have an increased risk of PCOS.

And according to Amy E Lacroix,HuriaGondal, et al National library of medicine March 11,2023. Menarche is defined as the first menstrual period in a female adolescent. Typically, menarche occurs between the ages of 10-16 years with the average age of onset being 12-4 years.

According to Dr Sarada M, consultant obstetrician and gynaecologist Yashoda hospital, “as the human race is evolving, the age of menarche is becoming earlier. if girls don’t start their age of periods by 14 then they should worry and consult a doctor for further tests. Similarly, Dr Pratima Reddy senior obstetrician and gynaecologist at fortis La Femme hospital explains that the receding age of menarche seems to be a universal trend, previously it was 15-16 but now it is 12-13 years. Hence from the survey it was found that 68% of girls who attained puberty at the age of 15-16 years suffers from PCOS.

The common problems seen in the girls suffering were found to be the highest weight loss followed by mood swings and hairloss. And about 58% of college going girls are unaware of the PCOS and its symptoms and about 43% of the total samples were unaware of the symptoms and the syndrome .

### **Recommendations and suggestions:**

If we startworking earlyon the young girls during their first pubertal signs, then with the help of the following factors we can at least manage the age of menarche and its possible effects on their bodies like:

- 1) Proper dietary habits e.g.: - no processed, packaged food more of fresh organic vegetables and fruits. Proper meal timings
- 2) Active lifestyle like indulging in any sport or at least 15-20 minutes walking habit during early morning or yoga.
- 3) Lifestyle modifications like proper sleep patternsand. stress free environment.

More community awareness programs like seminars,workshops, health camps and health education lectures, free dietitian counselling can be organised at high schools and graduate colleges to impart knowledge about the PCOS, its symptoms, causes and most importantly its management because on time diagnosis helps to initiate appropriate treatment and prevention.

**Limitations:** Due to lack of laboratory testingkits, societal norms and beliefs , the clinical screening of every girl was difficult.Hence this study could help identify possible causes of PCOS , their menstrual age and problems faced .

These girls were counselled about the importance of healthy diet and lifestyle modifications for better management of the syndrome.

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