Original Research Article

Prevalence of polycystic ovary syndromes (PCOS) in adolescent girls and young women: A questionnaire-based study

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A R T I C L E   I N F O

A B S T R A C T

Background: One of the most prevalent metabolic disorders among women of reproductive age is polycystic ovarian syndrome (PCOS).
Menstrual dysfunction and androgen excess symptoms, such as hirsutism and acne, are common in women with PCOS. Additionally, there may be an increased risk of other morbidities such as obesity, insulin resistance, type 2 diabetes mellitus, cardiovascular diseases, infertility, cancer, and psychological disorders.
Aim: This study is an attempt to summarise the prevalence of polycystic ovarian syndrome(PCOS) in adolescent girls and young women residing in the National Capital Region belonging to the age group of 11-30 years.
Materials and Methods: The study was questionnaire-based and carried out for a duration of 6 months with 267 participants.
The BMI of the participants was calculated using the formula: BMI= weight in kgs/ height in m2.
PCOS was diagnosed using a questionnaire with Rotterdam's criteria.
Result: The prevalence of PCOS was found to be 77.1%. The mean age group at which maximum number of participants were diagnosed with PCOS was 18-20 years. The BMI (BMI=kg/m2) of all the participants was calculated and 8% participants came under the obese category.
90% of the participants were aware of PCOS, 79.2% participants agreed PCOS is increasing rapidly while 19.3% participants had no idea about PCOS.
Conclusion: The study concludes that respondents were less aware of the actual prevalence of PCOS and also associate the disorder's manifestation with lifestyle variations. Even at this young age adolescent girls and women are at a high risk of metabolic syndrome because of the increased prevalence of sedentary lifestyles and lack of physical activity.
A good diet, regular exercise, early diagnosis, and treatment modalities available are all critical components of raising awareness about PCOS and the risk factors associated with it.

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1. Introduction

In addition to being the most prevalent endocrine illness affecting women, with an estimated frequency of 10-15%, polycystic ovary syndrome is a condition with wide-ranging effects on both reproductive and general health.[1] World Health Organization estimates that PCOS affected 116 million women (3.4%) worldwide in 2012.[2] In India, experts claim 10% of women are affected by PCOS, yet no proper published statistical data on the prevalence of PCOS in India is available.[3]

Estimates of PCOS prevalence vary widely around the globe, from 2.2% to as high as 26%. Irving Stein and Michael Leventhal were the first to use the phrase "polycystic ovarian disease," which they defined as the Triad

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of Amenorrhea, Obesity, and Hirsutism.[4] It is hence also known as 'Stein-Leventhal Syndrome' or 'Hyperandrogenic Anovulation'. PCOS is also referred to as Syndrome O due to the overproduction of Insulin. ovulatory disturbance, ovulatory confusion, and overnutrition. Endometrial cancer, cardiovascular disease, dyslipidemia, type-2 diabetes, and infertility are more common in women with PCOS.[5] Elevated androgen levels, irregular menstrual cycles, multiple ovarian cysts, obesity, acne, hypertension, diabetes, hirsutism, and infertility are some of the complex symptoms of this illness.[5,6]

Gynecologists regularly diagnose PCOS, so it's critical to have a thorough awareness of the long-term effects of the diagnosis to treat the condition holistically. Both non-pharmacological and pharmaceutical approaches are used to treat PCOS. While the latter entails the use of oral contraceptives, antiandrogens, antidiabetic, anti-obesity medications, and statins, the former involves the identification of the condition and lifestyle adjustments. Cystectomy is a surgical technique that is a last resort for healing.[7,8]

Diagnostic criteria for Rotterdam diagnosis of polycystic ovary syndrome

Two of the following three criteria are required:

1. Oligo/anovulation
2. Hyperandrogenism
3. Clinical (hirsutism or less commonly male pattern alopecia) or
4. Biochemical (raised FAI or free testosterone)
5. Polycystic ovaries on ultrasound

Other aetiologies must be excluded such as congenital adrenal hyperplasia, androgen-secreting tumors, Cushing syndrome, thyroid dysfunction, and hyperprolactinemia.

2. Aim and Objective

To study the status of Polycystic Ovarian Syndrome (PCOS) in adolescent girls and young women (age 13-30 years) along with an assessment of its awareness.

The general objective of the study is to evaluate the knowledge, Attitude, and practice (KAP) in women with PCOS.

3. Materials and Methods

The questionnaire-based survey will be conducted in females of 11-30 years of age.

3.1. Participant's consent

Each person who will be a part of the study will have given informed consent. The study will involve willing participants who are females between the ages of 11 and 30 from various schools, colleges, and married women

(including working and stay-at-home mothers) residing in the National Capital Region.

3.2. Exclusion criteria

1. Participants under 11 and those over 30 are not allowed to participate.
2. Participants who leave the survey forms blank will also be disqualified.

3.3. Inclusion criteria

1. Willing to participate
2. Age group 11-30 years

3.4. Duration of the study

6 months.

3.5. Study analysis

Results will be analyzed using the Chi-square test for multivariate analysis.

4. Result

Section A- Demographic data and lifestyle

1. As per the BMI calculated(BMI= kg/m2) of the participants, 56% were normal, 34% were overweight and 8% belonged to the obese category.
2. On studying the consumption of fruits 38% of the population consumed every day, 14.8% twice/thrice in a week, 15.8% alternate days, and 7% once a week.
3. 6% of the population practiced smoking regularly and 20.8% population practiced alcohol daily.
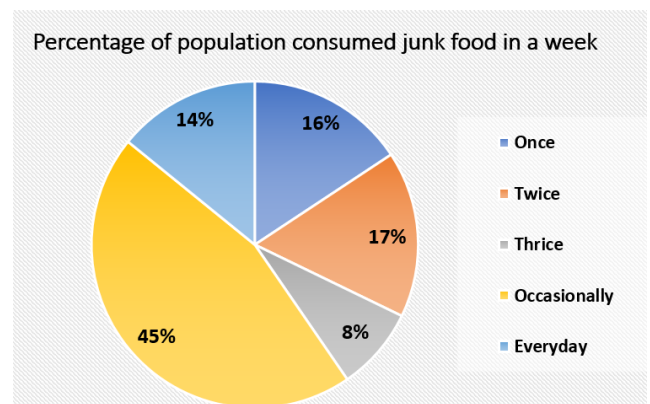

Fig. 1:

Section B – Knowledge about PCOS

1. 90% of the population was aware that PCOS is the most common lifestyle disorder among the adolescent population today.

2. 77.1% of participants were diagnosed with PCOS and the the mean age group was at the time of diagnosis was18-20 years.
3. Looking at the awareness regarding investigation options of PCOS, 75.7% undergo blood tests, and 72.2% got an ultrasound done.

Section C – Attitude towards PCOS

1. 1. 79.2% of the participants agreed PCOS is increasing rapidly while 19.3% of participants have no idea.
2. Only 71% of the participants exercised every day regularly while 28.8% of participants doesn't even exercise at all.
3. 35.1% of participants usually sit 8-10 hours in a day, 24.2% sit 6-8 hours, 17.9% sit 4-6 hours and 14.7% of participants sit all day.
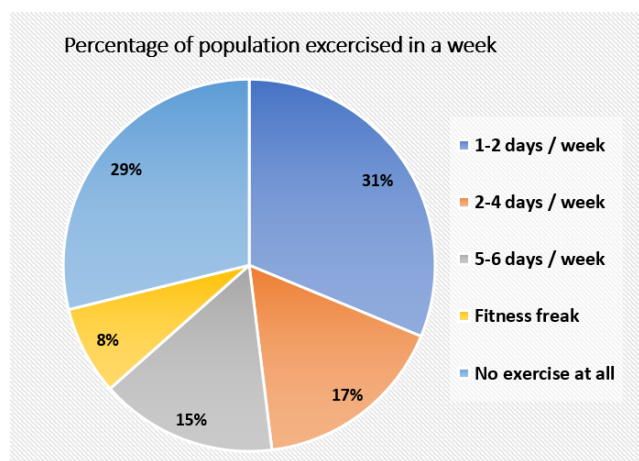

Fig. 2:

Section D – PCOS and its clinical features

1. 50.5% of participants sometimes sleep during day time, 22.8% take an afternoon nap daily and 26.7% didn't sleep during the daytime.
2. Out of all participants 16.5% participants snore during sleep
3. 64.6% of participants had continuous weight gain out of which 56.5% had difficulty in losing weight and 69.5% had waistlines more than 35 inches.
4. Out of the total participants 53.3% had acne problems in the past, especially in the face region.
5. Participants also complain of unwanted hair growth on their body such as 24.6% in the chin area, 22.1% on the upper lips area, 18in5 on their abdominal area, 8.8% on their back and thigh region, 7.7% on the chest and 5.6% on the upper arm.
6. 55.8% population had excessive hair loss/ hair thinning problems and 24.2% of participants notices pigmentary changes on their bodies.

7. 56.1% population experienced extreme mood swings.
8. Many of the participants had a family history of other medical problems such as 46.7% had diabetes history in their family, 39.6% hypertensive, 13.7% obese and 6% had cancer in their family.
9. 69.5% of participants complain of irregular menstrual cycles.

Table 1: Analysis of sociodemographic profile (n = 267)

S.No.	Sociodemographic characteristics	Percentage
1	**Age** (years)	60.3% (Mean Age – 22.5)
2	**Education** – (i) Upto 10th class	1.8%
	(ii) Upto 12th class	26.3%
	(iii) Graduate	71.9%
3	**Residence –** (i) Rural	6.3%
	(ii) Urban	93.7%
4	**Marital Status- (i) Unmarried**	16.8%
	(ii) Married	83.2%
5	**Occupation**- (i) Student	75.4%
	(ii) Working	17.2%
	(iii) Homemaker	4.6%

Table 2: Percentage of the population's knowledge about PCOS

S. No.	Factors	Percentage
1	Genetics	10.5%
2	Lifestyle disease	52.6%
3	Controlled by Medicines	15.8%
4	PCOS is controlled by environmental factors	4.9%
5	No idea	16.1%

5. Discussion

PCOS is characterized as a hormonal imbalance syndrome. As shown in Table 1, analysis of participant sociodemographic profiles plays a key role in learning about PCOS. While in our study the mean age was 22.5 years, a study by Gul et al. found that the average age for PCOS presentation is third decade, ranging between 25 and 32 years. Therefore, the primary cause of this was ovarian hyperstimulation, which is known to happen in middle age and has a higher occurrence during active reproductive cycle stages.[9] Due to many health education programs and practices, education qualification plays a significant part in learning about PCOS. According to studies by Guruya et al., 65% of recent grads are familiar with PCOS.[10] The same study notes that urban residents are more aware of PCOS than rural residents, which is also seen in the current study.

In studying the knowledge about PCOS in society, the results of the study as indicated by the data in Table 2 show

that 52.6% population think it's a lifestyle disease, 15.8% think it is controlled by medicines/good lifestyle 10.5% think it's a genetic disease runs in families and 4.9% think it is controlled by environmental factors while 16.1% had no idea (Figure 3).
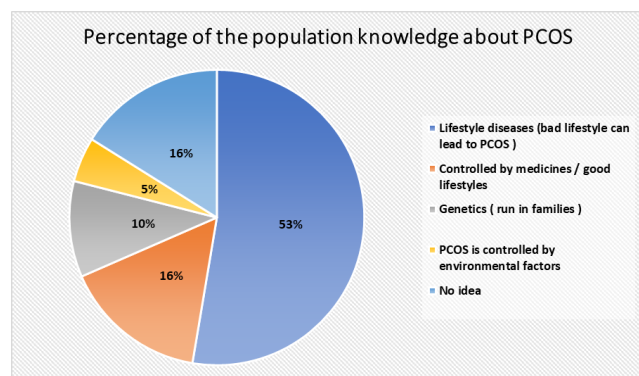

Fig. 3:

Therefore, everyone needs a full understanding of the illness and its treatment due to the variable nature of PCOS and the wide range of probable signs and symptoms. Obesity, infertility, gestational problems, type 2 diabetes, endometrial cancer, cardiovascular disease, and many more disorders are linked to this. According to studies, women with PCOS are more likely to have hyperlipidemia, hypertension, subclinical atherosclerosis, and endothelial dysfunction. These conditions all enhance the risk of obesity in these individuals.[11] Menorrhagia, gestational diabetes, irregular menstruation, pre-eclampsia, infertility, and fetal loss are issues that can arise from obesity in PCOS.[12]

According to a study, women with PCOS have very high rates of infertility, and they are highly worried about their declining chances of becoming pregnant.[13] Infertility, irregular ovulation or menstruation, and enlarged ovaries were found to be the signs and symptoms of PCOS in women, according to a study that included study participants in the 18–30 age range. Prolonged symptoms of PCOS can lead to diabetes, heart disease, and endometrial cancer.[14] According to a recent study, weight loss and lifestyle changes are the first lines of treatment for PCOS patients. Losing even 5% of body weight can boost ovulatory frequency, improve the hormonal profile, and raise the chances of getting pregnant.[15]

In addition, according to BMI status, women with PCOS were more likely than women without PCOS to face future health-related issues such as weight gain, loss of femininity, loss of sexuality, and infertility.[16]

The key to treating PCOS is using a holistic approach. A good diet and regular exercise can help women with PCOS lose between 10 and 14 percent of their body weight, which lowers their risk of hyperlipidemia, cardiovascular illnesses, and infertility. Exercise reduces abdominal obesity, blood

sugar, blood lipids, testosterone, and androgen levels, as well as improves menstrual cycle regularity, fertility, and ovulation.

In addition, women with PCOS experience less mental stress, anxiety, and depression as well as a boost in their self-esteem.[17] For improved metabolic health and reproductive function, women with PCOS should exercise for at least 90 minutes per week at a mild-moderate intensity (60-70% VO2 max), according to CL Harrison et al. In young, overweight women with PCOS, regular, moderate-intensity aerobic exercise improves fertility, controls menstrual cycles, and helps reduce weight and insulin resistance.[18]

The participants in the current study may have over or under-reported their knowledge, attitudes, and practices as a result of the form of the questionnaire, which could have affected the study's findings due to self-report bias. Therefore, in the future, a study that uses a validated tool to learn more about the knowledge, attitude, and practices of women with PCOS should be carried out at several sites with a larger number of participants being recruited randomly to reduce the bias.

6. Conclusion

The study's findings indicate that respondents were less aware of the true frequency of PCOS and also linked the condition's symptoms to alterations in lifestyle. Due to the rising incidence of sedentary lifestyles and inactivity, these adolescent girls and women are at a greater risk of developing metabolic syndrome even at this young age. The risk factors and problems of PCOS need to be made public, with a focus on the need for regular exercise and a good diet.

7. Source of Funding

8. Conflict of Interest

None.

References

1. Revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome (PCOS). *Hum Reprod.* 2004;19(1):41–7.
2. Kabel AM. Polycystic ovarian syndrome: insights into pathogenesis, diagnosis, prognosis, pharmacological and nonpharmacological treatment. *Pharm Bioprocess.* 2016;4(1):7–12.
3. Bharathi RV, Swetha S, Neerajaa J, Madhavica JV, Janani DM, Rekha SN, et al. An epidemiological survey: Effect of predisposing factors for PCOS in Indian urban and rural population. *Middle East Fertil Soc J.* 2017;22:313–6.
4. Stein IF, Leventhal ML. Amenorrhea associated with bilateral Polycystic Ovaries. *Am J Obstet Gynecol.* 1935;29(2):181–91.
5. Mcfarland C. Treating polycystic ovary syndrome and infertility. *MCN Am J Matern Child Nurs.* 2012;37(2):116–21.
6. Clemland EM, Weinstein LC, Buchanan EM. Menstruation-related disorders. In: Dipiro JT, Talbert RL, Yec GC, editors. Pharmacotherapy: A physiologic approach; 2011. p. 1393.

7. Hamburg R, Hendriks MC, Konig TE, Anderson RA, Balen AH. Clomifene citrate or low-dose FSH for the first-line treatment of infertile women with anovulation associated with polycystic ovary syndrome: a prospective randomized multinational study. *Hum Reprod*. 2012;27(2):468–73.

8. Badacoy A, Mosbah A, Shady M. Anastrozole or letrozole for ovulation induction in clomiphene-resistant women with polycystic ovarian syndrome: a prospective randomized trial. *Fertile sterile*. 2008;89(5):1209–12.

9. Gul S, Zahid SA, Ansari A. PCOS: Symptoms and Awareness in Urban Pakistani Women. *IJPRHS*. 2014;2:356–60.

10. Guraya SS. Prevalence and ultrasound features of polycystic ovaries in young unmarried Saudi females. *J Microsc Ultrastruct*. 2013;1(1-2):30–4.

11. Pitchai P, Sreeraj SR, Anil PR. Awareness of lifestyle modification in females diagnosed with polycystic ovarian syndrome in India: explorative study. *Int J Reprod Contracep Obstet Gynecol*. 2016;5(2):470–6.

12. Motta AB. The role of obesity in the development of polycystic ovary syndrome. *Curr Pharm Des*. 2012;18(17):2482–91.

13. Panidis D, Tziomalos K, Papadakis E, Katsikis I. Infertility treatment in polycystic ovary syndrome: lifestyle interventions, medications and surgery. *Front Horm Res*. 2013;40:128–41.

14. Shenoy PB, Brundha MP. Awareness of polycystic ovarian disease among females of age group 18-30 years. *J Pharm Sci Res*. 2016;8(8):813–6.

15. Marciniak A, Lejman-Larysz K, Nawrocka-Rutkowska J, Brodowska A, Songin D. Polycystic ovary syndrome - Current state of knowledge. *Pol Merkur Lekarski*. 2018;44(264):296–301.

16. Moran L, Gibson-Helm M, Teede H, Deeks A. Polycystic ovary syndrome: A biopsychosocial understanding in young women to improve knowledge and treatment options. *J Psychosom Obstet Gynaecol*. 2010;31(1):24–31.

17. Thomson RL, Buckley JD, Brinkworth GD. Exercise for the treatment and management of overweight women with polycystic ovary syndrome: A review of the literature. *Obes Rev*. 2011;12(5):202–10.

18. Harrison CL, Lombard CB, Moran LJ, Teede HJ. Exercise therapy in polycystic ovary syndrome: a systematic review. *Hum Reprod Update*. 2011;17(2):171–83.

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