

Phenotype Characteristics and Risk Factors of Polycystic Ovarian Syndrome among Nursing Students

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Abstract

Background: Polycystic ovarian syndrome (PCOS) is a common endocrine condition that occurs in women and is associated with problems such as menstrual irregularities; hirsutism; obesity; insulin resistance; acne; and later life with diabetes mellitus and uterine cancer.

Aim: The study was to assess phenotype characteristics and risk factors of the polycystic ovarian syndrome among nursing students.

Methods: Cross-sectional study (descriptive) included a sample of 400 females from the Faculty of Nursing, Zagazig University, Egypt.

Tools: The tools were used for data collection; structured-interviewing questionnaire sheet, data related to anthropometric measures, risk factors about PCOS, and observational checklist about phenotype characteristics of PCO.

Results: The results showed that (6%) of the studied student females had a family history of PCO, nearly half of them had fast food, more than half of studied student females had hirsutism, more than one quarter had acne, (14.5%) had menstrual irregularity and one-third of them had continuous abnormal weight gain. Also, this study showed that lack of awareness was found among the majority of girls about PCOS.

Conclusion: It could be concluded that a family history of PCOS, obesity, and fast food diet habits are found to be the predisposing factors for the development of PCOS. The risk of PCOS increases with the presence of one or more identified predisposing factors. Most of the factors tested as predisposing factors in our study are interlinked to each other and are mostly modifiable. Although PCOS is a prevalent endocrine disorder, there was poor knowledge among student females in the Faculty of Nursing Zagazig University.

The study recommended screening programs from the ministry of health for early detection of predisposing factors of PCOS including the secondary school students and faculties' students through educational programs and messages through the counselling, brochures, to increase student's awareness about PCOS symptoms.

Future Perspective: Further research on a larger sample size to identify how the problem is risky and how to deal with it. Including the problem in social media and healthy channels.

Keywords: Risk Factors; Phenotype Characteristics; Polycystic Ovary Syndrome

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Introduction

Polycystic ovary syndrome (PCOS) is the most common endocrine condition in the developing world among women of reproductive age, affecting 5-10% of this population. This is generally characterized as the association of hyperandrogenism with chronic anovulation in women, without clear adrenal or pituitary gland underlying disease. In addition, PCOS is diagnosed on the clinical picture, supported in some women by biochemical abnormalities and/or polycystic ovaries on ultrasonography [1].

Polycystic ovarian syndrome (PCOS), also known as a polycystic ovarian disease (PCOD), sclerocystic ovarian syndrome, functional

ovarian hyperandrogenism, chronic an ovulatory syndrome, ovarian hyperthecosis, and stein-Leventhal syndrome (original term, not included in current literature). Thus PCOS was called the "feminine identity thief". This is the most common female endocrine (hormonal) condition characterized by numerous inactive ovarian follicle cysts interfering with ovarian function [1].

Symptoms typically associated with PCOS include irregular menstrual periods, oligomenorrhea and or severe menstrual bleeding, chronic anovulation, subfertility, clinical and/or biochemical signs of hyperandrogenism including (hirsutism cystic acne & alopecia), hair loss, skin oiliness, seborrhoea, ovarian micro polycystic appearance



and metabolic abnormalities such as hyperinsulinemia & obesity. Not all of these signs usually occur in the same woman [2].

Environmental status and factors, such as obesity, appear to exacerbate the underlying genetic predisposition. PCOS is characterized by increased circulating androgen rates, polycystic ovarian morphology (PCOM), suspended follicular growth, and anovulatory infertility. PCOS is usually related to insulin resistance, hyperinsulinemia, metabolic syndrome components, and oligo-anovulatory cycles [3].

While some of the clinical symptoms and presentations of PCOS are age-dependent, ovarian failure and hyperandrogenism (HA) are common at any age [3].

The impact of these symptoms on the quality of life of women can be profound and can lead to psychological distress that threatens female identity and potential disturbances in sexual behavior and attitude. Therefore the disorder may lead to altered self-perception, unstable family dynamics, and problems at work [4].

Accumulating evidence of PCOS-related long-term health threats (e.g. diabetes mellitus) may also harm psychological well-being. However, PCOS diagnosis was found to be associated with the sensation of agitation and anxiety [5].

Patients with PCOS can also be assumed to have higher morbidity and mortality from the sequelae of the metabolic syndrome (type 2 diabetes mellitus, obesity, hypertension, lipid disorders, heart disease, and atherosclerosis [6].

Since there is currently no cure, PCOS management is aimed at improving the health of the patient by symptomatically alleviating and preventing complications in the long term [7].

Nurses can influence women with PCOS positively through counselling and education. This can also help women dealing with a negative self-image that is secondary to the physical manifestation of PCOS. Such education helps women understand the syndrome and its associated risk factors to avoid long-term health problems. It encourages women to make positive lifestyle changes makes community referrals to local support groups to help women build their coping skills [8].

Nurses play an important role directly or indirectly in the assessment and improvement of female health throughout the PCOS. Furthermore, nurses represented a variety of care settings and specialized areas abroad, including clinical practice, education, administration, and research. So, nurses are key providers of PCOS care. Hence, their respective on health for polycystic ovary syndrome patients are very important [9].

Significance of the study

Until now, PCOS has been considered incurable and had many serious characteristics and complications such as infertility, diabetes mellitus, and cardiovascular disease. So, the nurse-midwife should consult women about lifestyle modifications such as; physical exercises, reducing weight and obesity, eating healthy food, and maintaining BMI between 19 and 25 and taking prescribed drugs [10]. So the current study was done to assess risk factors and phenotypic characteristics of PCOS among nursing students for early detection of PCOS. And to provide small summary health education guidelines for these students informing them how to deal with PCOS.

Aim of the study: The aim of the present study was to assess phenotype characteristics and risk factors of the polycystic ovarian syndrome among nursing students.

Objectives

1. Assess phenotype characteristics.
2. Identify risk factors of the polycystic ovarian syndrome.
3. Assess knowledge about polycystic ovarian syndrome among nursing students.

Research questions

1. What are the phenotype characteristics of polycystic ovarian syndrome?
 2. What are the risk factors of polycystic ovarian syndrome?
- What is the students' knowledge about PCOS?

Subjects and Methods

Research Design

Across sectional design (descriptive) was conducted to achieve the aim of the study.

Study Setting

The present study was carried out in the Faculty of Nursing, Zagazig University, Sharkia Governorate, Egypt. The reasons given for choosing the above-mentioned setting are large numbers of students attending for learning and also it covers a wide range of students with different socio-demographic and as well as the students are in great need of continuous education.

Study Subjects

Study subjects of this study included a sample of 400 students in the first and second academic years.

Sample Size

Assuming the prevalence of the polycystic ovarian syndrome is 11.34% and enclosing the total number of students in the first and second academic years. And confidence level 95% and power of test 80% so the calculated sample is (400).

Tools of Data Collection

A questionnaire interview sheet: The structured interviewing questionnaire was designed in the English language by the researcher and was validated by highly qualified professional professors in the field. The interview was utilized to collect the necessary data about the study subjects. It was constructed using simple language structures, keeping in mind the educational level of each student. The interview consisted of seven parts as follows.

Part (I): Socio demographic characteristic of the sample

This part aimed to collect data related to name, age, residence, academic year, and marital status.

Part (II): Medical history

This part aimed to collect data related to student's health; it included data indicating the presence of diabetes, hypertension, cardiac disease, anaemia, cardiovascular disease, hyperthyroidism, and hyperinsulinemia.

Part (III): Family history

This part aimed to collect data related to the family's health; it



included data indicating the presence of diabetes, hypertension, and any other disease in the family.

Part (IV): Menstrual history

This part aimed to collect data about the age at menarche, cycle irregularity, length, duration of blood flow, acne problem during the menstrual cycle, pain during menstruation, etc.

Part (V): Anthropometric measures

This part aimed to collect data about student’s weight, height, waist circumference, body mass index, blood pressure, and blood glucose level.

Part (VI): Questionnaire about risk factors of polycystic ovarian syndrome

This part aimed to collect data about diet habits, consumption of fast-food, physical exercise, and family history of PCO.

Part (VII): Questionnaire about phenotype characteristics of PCO(questions 1-6)

This part aimed to collect data such as the unusual amount of hair growth at different parts of the body, acne, menstrual irregularity, continuous abnormal weight gain, an unusual amount of hair loss from scalp and discoloration, or dark color patches on the skin.

Part (VIII): knowledge questionnaire about PCO:

Developed by the researcher scoring yes score (1) and no score (0)

Ethical Consideration

Research ethics was considered and maintained during the study through the following:

- Students were informed that they are allowed to choose to participate or not in the study and they have the right to withdraw from the study at any time.
- The researcher clarifying the aim of the study to the students included in the study.
- The researcher assured that confidentiality of the subject data was maintained.
- The proposal reviewed and approved by the faculty ethics committee.

Validity and Reliability

Tools were reviewed by a panel of five experts in the field of obstetrics and gynecological specialty to test its content validity. Modifications were done accordingly based on their judgment. Reliability was done by Cronbach’s Alpha Coefficient Test which revealed that each item of the utilized tools consisted relatively homogeneous items.

Pilot Study

A pilot study was conducted on a sample of 10% of students who were not included in the total sample size. It was done to test the study tools in terms of clarity and feasibility, and the time required to be applied and to assess the degree of students ‘understanding of the questionnaire and acceptance to be involved in the study. Following the pilot study, the questionnaire was reconstructed and necessary modifications were done to reach the final form.

Field Work

Data collection took 6 months, from the first of February 2019 to the end of June 2019. After getting the official permission the pilot testing of the study tools was done and analyzed. The researcher started the data collection for 3 days per week before lectures and after lectures during the 6 months.

- Sampling will be started and expected to be completed until it reaches a predetermined size.
- Approval of student was obtained before taking history and after explaining the purpose of the study.
- The researcher measure waist circumference for each student by measuring tape and measure weight and height to assess anthropometric measures.
- The researcher measures blood pressure whereas, the normal range from (120/80) mm Hg. by blood pressure set.
- Also, random blood glucose level was measured using a blood glucose set, whereas the normal level is 80-140mg/dl (4.4-7.8 mmol/l).
- The researcher completed the questionnaire by interviewing each student individually for 15-20 min in between lectures. Tool filled” structured interviewing questionnaire” in 5-10 min. The researcher observes manifestation such as facial hair and pigmentation.
- The researcher provides the students with proper health education about PCOS, risk factors, complication, and lifestyle modification as diet, exercise, and weight loss after filling the interview questionnaire in the form of hand-outs.

Statistical Analysis

Data entry was done using Epi-Info 6.04 computer software package, while statistical analysis was done using statistical packages for social science (spss) version 20. Quality control was done at the stages of coding and data entry. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables and means and standard deviations for qualitative variables.

Qualitative variables were compared using the chi-square test. Statistical significance was considered at P- value < 0.05, a highly significant difference obtained at p<0.001.

Results

Table 1: Socio demographic characteristics of studied females.

Socio demographic characteristics	N=400	Percentage (%)
Age(years)		
18-20	386	96.5
>20	14	3.5
Mean ± SD (19.31 ± 0.852)		
Academic year		
First	230	5.57
Second	170	42.5
Marital Status		
Married	12	3
Un married	386	96.5
Divorced	2	0.5
Widowed	0	0
Residence		
Rural	300	75
Urban	100	25



Described socio demographic characteristics of studied students (400). It was found that range of the studied students age (18-20) years with mean was (19.31) years old. Meanwhile more than half of studied females (57.5%) were in first academic years and three quarter (75%) of females were from rural area.

Table 2: Distribution of studied students according to anthropometric measures.

Anthropometric measures	(n =400) mean ± SD (Range)
Weight (Kg)	63.86±10.5 (45-104)
Height(cm ²)	160±12.2 (150-180)
Waist circumference	76.7±9.4 (70-105)
Body Mass Index (BMI) (Kg/m ²)	26.9±4.3 (19-29)
Blood pressure (mm/hg)	
Systolic	(115-145)
Diastolic	(65-100)
Blood glucose level (mmol/L)	98.77±15.9 (66-130)

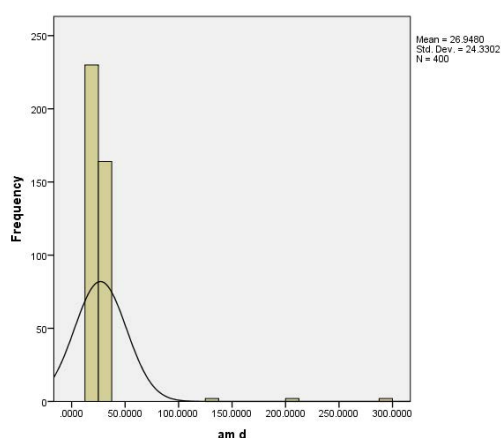


Figure 1: Body Mass Index (BMI) among female students. Illustrated that mean Body Mass Index (BMI) among female students was (26.9±24.3).It showed that mean weight among studied females was 63.86±10.5, mean height among studied group was 160±12.2, mean Body Mass Index (BMI) among studied female was 26.9±24.3 and blood glucose level (mmol/L) among studied females was 98.77±15.9.

Table 3: Frequency of risk factors of polycystic ovarian syndrome among studied group.

Risk factors of polycystic ovarian syndrome	Studied students (n=400)	
	No.	%
Family history of PCO		
Yes	24	6
No	376	94
Dietary habits		
Snakes Very heavy		
Yes	242	60.5
No	158	39.5
Fast food		
Yes	196	49
No	204	51
IF YES		
< 3days/week	56	29
>3 days/week	140	71
Refined Carbohydrates as white bread		
Yes	280	70
No	120	30
Sugary beverages, such as sodas		
Yes	230	57.5
No	170	42.5
Excess red meat, such as hamburgers		
Yes	134	33.5
No	266	66.5

Showed that mean weight among studied females was 63.86±10.5, mean height among studied group was 160±12.2, mean Body Mass Index (BMI) among studied female was 26.9±24.3 and blood glucose level (mmol/L) among studied females was 98.77±15.9.

Discussed that (6%) of studied students had family history of PCO risk factors. Meanwhile more than three fifth of the studied group eating snakes very heavy (60.5%).In addition to nearly half (49%) of them had fast food (71% of them >3 days/week) and (70%) of them had refined carbohydrates as white bread, (57.5%) of them had sugary beverages, such as sodas.

Table 4: Frequency of risk factors of polycystic ovarian syndrome among studied students.

Risk factors of Polycystic Ovarian Syndrome	Studied students (n=400)	Percentage (%)
Diet		
a-Rich in Vegetables	104	26
b-Non vegetables	40	10
c-mixed	256	64
Water Intake Per Day		
A-500-1000 ml	218	54.5
B->1000-2000 ml	126	31.5
C->2000 ml	56	14
Physical exercise		
Yes	348	87
No	52	13
IF yes		
>3 days/week	116	33
< 3days/week	232	67
Type of exercise		
Nothing		
Walking	52	13
Running	270	77.5
Exercise	10	3
Football	15	4
Basket	18	5
others	12	3
	44	13

Provided that the student may has had more than one answer

Showed that about one quarter (26%) of studied students had diet rich in vegetables, (54.5%) of them had insufficient water intake per

Table 5: Frequency of phenotype characteristics of PCO among studied students.

Phenotype characteristics of PCO	Studied students (n=400)	
	No.	%
Unusual hair distribution at abnormal sites of your body(hirsutism)		
Yes	218	54.5
No	182	45.5
Acne		
Yes	110	27.5
No	290	72.5
Menstrual irregularity		
Yes	58	14.5
No	342	85.5
Continuous abnormal weight gain		
Yes	124	31
No	276	69
Alopacia (Unusual amount of hair loss from scalp)		
Yes	58	14.5
No	342	85.5
Acanthosis (Discoloration or dark color patches on skin)		
Yes	50	12.5
No	350	87.5



day{normal water intake per day 2000-3000 ml/day} meanwhile 87% of them had physical exercise, more than one third of studied females 33% had physical exercise more than three days per week. In addition (77.5%) of them mostly walking.

Revealed that more than half (54.5%) of studied students had hair distribution at abnormal sites of their bodies, more than one quarter (27.5%) had acne, (14.5%) had Menstrual irregularity, Meanwhile (31%) had continuous abnormal weight gain, 14.5% of them had unusual amount of hair loss from scalp and (12.5%) had discoloration or dark color patches on skin.

Table 6: Knowledge regarding PCOS among studied students.

Knowledge regarding polycystic ovarian syndrome	Studied students (n=400)			
	No.		%	
	yes	no	yes	no
Have you heard about "polycystic ovarian syndrome"	190	210	47.5	52.5
In PCOS there is increased level of androgen hormone	76	324	19	81
Obesity may cause PCOS	210	190	52.5	47.5
Irregular or absence of menstrual period) cycle is a symptom of PCOS	232	168	58	42
Unusual amount of hair growth on different body parts (upper lip, chin, abdomen, breast, thighs) is a symptom of PCOS	138	262	34.5	65.5
Hair loss from scalp more than normal is a symptom of PCOS	110	290	27.5	72.5
PCOS may leads to diabetes mellitus	52	348	13	87
PCOS may leads to heart diseases	70	330	17.5	82.5
PCOS may leads to anxiety and depression	176	224	44	56
PCOS may leads to infertility (inability to have children)	238	162	59.5	40.5

Showed that majority of the studied group answered negatively of all knowledge questions such as majority of them (87%) answered no regarding the question say (PCOS may leads to diabetes), more than three quarter (81%) of them answered no regarding the question say (in PCOS there is increased level of androgen hormone) and more than half of them (52.5%) answered no regarding the question say (Have you heard about polycystic ovarian syndrome).

Table 7: Relation between socio-demographic characteristics and level of knowledge about PCOS among the studied students.

Socio-demographic Characteristics	Knowledge level				χ^2	P
	unsatisfactory N(112)		satisfactory N(288)			
	%	N	%	N		
Age						
18-20	278	96.5	108	96.4	0.001	0.961
> 20	10	3.5	4	3.6		
Academic year						
First	162	56.2	68	60.7	0.802	0.37
Second	126	43.8	44	39.3		
Marital Status						
Married	10	3.5	2	1.8	1.275	0.528
Separated	276	95.8	110	98.2		
Divorced	2	0.7	0	0		
Residence						
Rural	226	78.5	74	66.1	0.014	0.907
Urban	62	21.5	38	33.9		

Showed that no statistical significant difference between level of knowledge and academic year, marital status and residence as $p > 0.05$.

Discussion

The polycystic ovary syndrome (PCOS) is a lifetime disorder that

occurs in 5% to 10% of women of reproductive age, making it one of the most common endocrine disorders. That is to say, PCOS results in menstrual cycle disturbances and infertility, hirsutism, disturbed glucose tolerance, insulin resistance, obesity, arterial hypertension and other metabolic syndrome [11].

According to Begum S, et al. (2017) [2] family history of PCOS, Obesity and fast food diet are found to be the predisposing factors for development of PCOS. The risk of PCOS increases with presence of one or more identified predisposing factors. Most of the factors are interlinked to each other and are mostly modifiable. Therefore the maternity nurse should recognize that careful monitoring and proper management of identified predisposing factors not only delays but also helpful in adequate management of the disease.

Regarding sociodemographic characteristics this study revealed that the mean age of studied female students was (19.31) years old. This finding was on the same line with the study done by Begum S, et al. (2017) [2] in Pakistan. They studied 250 female students participated in the study. They found that the mean age of participants was 19.76 ± 1.68 years.

This study showed that three quarter of females were from rural area. This finding agrees with study done in Pakistan by Haq N, et al. (2017) [12] who found that about three quarter of the study sample were rural.

This study showed that majority of studied students were unmarried and more than half of studied females were in first academic years. This finding was in similarity to a study done by Haq N, et al. (2017) [12] who found that majority of respondents were unmarried and nearly half of respondents were of first year.

Regarding to anthropometric measures of studied students this study showed that mean weight among studied female, mean height among studied female, mean body mass index (BMI) among studied female. This finding was in similarity to a study done in Indian by Ahmadi A, et al. (2013) [13] who found that mean weight among studied group was (57.90 ± 9.8) , mean height among studied group was (161.12 ± 5.5) , and mean body mass index (BMI) among studied group was (23.14 ± 3.8) .

Regarding to risk factors of Polycystic Ovarian Syndrome among studied students this study showed that previous family history of PCO 6%. This finding was on the same line with the study done by Ahmadi A, et al. (2013) [14] who found that when family history of PCOS was taken it was observed that about two fifth had positive family history in first degree relative. In the study done in USA by Kabsar-Miller M, et al. (2011) [15] of the 78 mothers and 50 sisters evaluated clinically, 19 (24%) and 16 (32%) were affected with PCOS. This shows that there is genetic predisposition for PCO.

The current study revealed another important finding concerning risk factors of PCOS. It revealed that three fifth of the studied females eating snakes very heavy. In addition to about half of them had fast food and more than two third had refined carbohydrates as white bread, also nearly three fifth of them had Sugary beverages.

This finding agreed with the study done by Begum S, et al. (2017) [2] who reported that participants with more frequent consumption of fast food have 1.7 times greater risk of development of PCOS. Fast food usually contains high amounts of saturated fats and steroids frequent consumption of fast food and irregular eating habits leads to fluctuations in glucose levels, insulin resistance and increases



hormonal imbalance such as hyperandrogenism adding to the risk for development of PCOS.

The current study revealed that more than half of them had hirsutism, 14.5% had unusual amount of hair loss from scalp, meanwhile more than one quarter of them had acne and 12.5% had acanthosis. These results were in contrast with Ahmadi A, et al. (2013) [14] who found that acne or oily skin suggestive of androgenic activity was observed in more than three fifth of adolescent girls. Hirsutism was found in nearly one fifth of cases. Loss of hair was in 7% of girls while pigmentation was in more than one third of girls. A study done in Rawalpindi by Nazir F, et al. (2011) [16] found that different results that most of respondents have hirsutism. The discrepancies among various studies and the present one has been attributed to the cultural background and inclusion criteria of the studied subjects.

Regarding to knowledge about polycystic ovarian syndrome among studied group this study showed that lack of awareness were found among majority of girls, these findings are in agreement with other study of Sunanda B, et al. (2016) [17] in India.

Conclusion

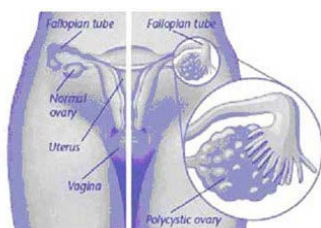
Family history of PCOS, obesity and fast food diet habits are found to be the predisposing factors for development of PCOS. The risk of PCOS increases with presence of one or more identified predisposing factors. Menstrual irregularity, signs of hyperandrogenism such as acne, excess body hairs (hirsutism), male-pattern baldness (alopecia) and infertility are phenotype characteristics of PCOS. The studied females have shortage of knowledge about PCOS so awareness was provided for them as information for better understanding of the disease, complications associated with it, and to participate actively in changing their life styles.

Recommendations

- Screening program from ministry of health for early detection of predisposing factors of PCOS including the secondary school students and faculty's students.
- Educational programs and messages through the counselling, brochures, to increase student's awareness about PCOS symptoms.
- Further researches on larger sample size to identify how the problem is risky and how to deal it.
- Including the problem in social media and healthy channels.

Health education about polycystic ovarian syndrome for nursing female's students

Definition: Polycystic ovary syndrome is a condition in women characterized by irregular or no menstrual periods, acne, obesity, and excess hair growth. PCOS is a disorder of chronically abnormal ovarian function and hyperandrogenism (abnormally elevated androgen levels). It affects 5-10% of women of reproductive age. PCOS is also called the Stein-Leventhal syndrome.



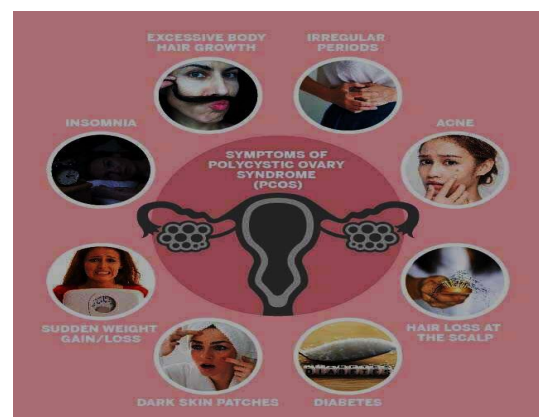
Unlike women with normal ovaries (left), women with PCOS may have enlarged ovaries that contain small cysts (right).

Risk Factors for PCOS



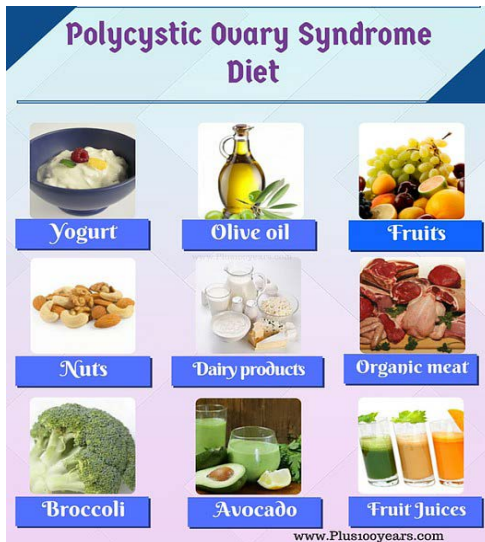
Symptoms of PCOS

- Irregular menstrual cycle. Women with PCOS may miss periods or have fewer periods (fewer than eight in a year). Or, their periods may come every 21 days or more often. Some women with PCOS stop having menstrual periods.
- Too much hair on the face, chin, or parts of the body where men usually have hair. This is called "hirsutism." Hirsutism affects up to 70 percent of women with PCOS.
- Acne on the face, chest, and upper back.
- Thinning hair or hair loss on the scalp; male-pattern baldness.
- Weight gain or difficulty losing weight
- Darkening of skin, particularly along neck creases, in the groin, and underneath breasts.
- Skin tags, which are small flaps of excess skin in the armpits or neck area.



The 5 Essential Components of a Healthy Lifestyle for PCOS.

1. Eat a healthy diet
2. Exercise regularly
3. Get plenty of sleep
4. Get a hold on stress
5. Manage your weight



Diet Rules for PCOS



AVOID

- Processed and refined foods such as maida, whole milk diary, red meat, fried food and breads
- Refined sugar, high-fructose corn-syrup, artificial sweeteners, artificial colors, trans-fats & high saturated fat.
- Packaged foods and junk food - Any product with a long ingredient list is usually highly processed.
- Alcohol

EAT

- Gluten-free grains like oatmeal, brown rice, millet, amaranth and quinoa.
- Drink two litres of purified water daily. You can flavor your water with fresh citrus, cucumber, mint or berries.
- Food with all natural ingredients.
- 5 to 6 meals a day, every 3-4 hours.
- Always combine a lean protein and complex carb at every meal/snack.

Treatment of PCOS: There is no cure for PCOS, but you can manage the symptoms of PCOS. You and your doctor will work on a treatment plan based on your symptoms, your plans for children, and your risk for long-term health problems such as diabetes and heart disease. Many women will need a combination of treatments, including:

- Weight loss
- Hair removal or slowing hair growth
- Prescription medicines

- In vitro fertilization (IVF)
- Surgery

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