



# IJPPR

INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH  
An official Publication of Human Journals

ISSN 2349-7203



Human Journals

**Research Article**

June 2023 Vol.:27, Issue:3

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## Survey on Knowledge about Polycystic Ovary Syndrome in Female Pharmacy Graduates

	<b>IJPPR</b> INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH An official Publication of Human Journals	
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**Keywords:** Polycystic Ovary Syndrome, Female Pharmacy Graduates, infertility, subfertility

### ABSTRACT

Polycystic ovarian syndrome is the most common endocrine disorder. PCOS related problems such as infertility, subfertility, hirsutism and oligo-amenorrhea may lead to significant reduction in women's quality of life. We wished to evaluate the psychometric properties of the polycystic ovary syndrome questionnaires (PCOSQ), a questionnaire developed to measure the health related quality of life of women with polycystic ovary syndrome. All participants completed a questionnaire, which asked clinical questions designed to assist in the diagnosis of PCOS as indicated. Questions were then evaluated for their power to predict PCOS, and a model was constructed using the most reliable items to establish a system to predict a diagnosis of PCOS.



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## INTRODUCTION:

The polycystic ovarian syndrome (PCOD) is the most common endocrine disorder. Polycystic ovary syndrome (PCOS) is a multifactorial and polygenic pathology that manifests itself with a wide spectrum of signs and symptoms that are related to the disturbances of reproductive, endocrine, and metabolic functions. Polycystic ovarian disease (PCOD) is one of the common reproductive endocrine disorders, affecting 5%–10% of women of reproductive age. Hirsutism, acne, menstrual irregularity, and infertility have been shown to be the most distressing symptoms in adults with PCOS<sup>1</sup>.

PCOS is the most common endocrine disorder among women of reproductive age, with symptoms of PCOS being seen in pre-pubertal girls, in some cases, and post-menopausal women, in many instances (Thomson et al., 2011). One source calculated that, in the U.S. alone, about four million women, ages fifteen to forty-four, are currently affected by PCOS; this source also noted that this was a very conservative estimate due to the low prevalence rate that was used in the source (Azziz, 2007).

The common age of onset for PCOS is adolescence while the common time of diagnosis is during a woman's third or fourth decade of life because the majority of symptoms do not become evident until, at menarche of the body resulting in reproductive, metabolic, and psychological consequences<sup>2</sup>.

Women consult gynecologists regarding menstrual cycle disorders; primary care providers and internists for hyperlipidaemia, insulin resistance, and possibly hypertension; dermatologists for hair and skin concerns; and psychiatric providers for treatment of depression and body image disturbances.<sup>4</sup> The area of greatest concern was found to be weight concerns followed by, in descending order, menstrual difficulties, infertility, emotional disturbance and hirsutism. At least 90% of women attending fertility clinics with failure to ovulate have PCOS<sup>1</sup>.

Many women have PCOD / PCOS but they don't know it. Group of symptoms that affects the ovulation and ovaries are;

- Ovarian cysts
- Increased levels of male hormones
- Skipped or irregular periods<sup>5</sup>

❖ **Sign and symptoms:**

Some females start seeing symptoms around the time of their first period, some women only discover when they have gained a lot of weight or trouble getting pregnant. The most common signs and symptoms of PCOD Problem or PCOS in females are:

Irregular menstruation (Oligomenorrhea)

Skipped or absence of menstruation (Amenorrhea)

Heavy menstrual bleeding (Menorrhagia)

Excessive Hair growth (face, body - including on back, belly, and chest)

Acne (face, chest, and upper back)

Weight gain

Hair loss (hair on the scalp gets thinner and fall out)

Skin darkening (Neck, in the groin, and under the breasts)

❖ **Causes of PCOS**

Exactly how women get affected by PCOS is not known, however these are some significant factors:

Excess insulin production: excess insulin levels in body might increase androgen production (a male hormone which is very less in female) that causes difficulty with ovulation.

Excess androgen production: The ovaries produce abnormally excess androgen hormones that can lead to acne and hirsutism (hair growth on the face and body).

Low-grade inflammation: As per the recent study, female with PCOS are having low-grade inflammation that causes increased level of androgen production which can lead to blood vessels or heart problem.

Heredity: Women with PCOS show certain genetics correlation.<sup>5</sup>

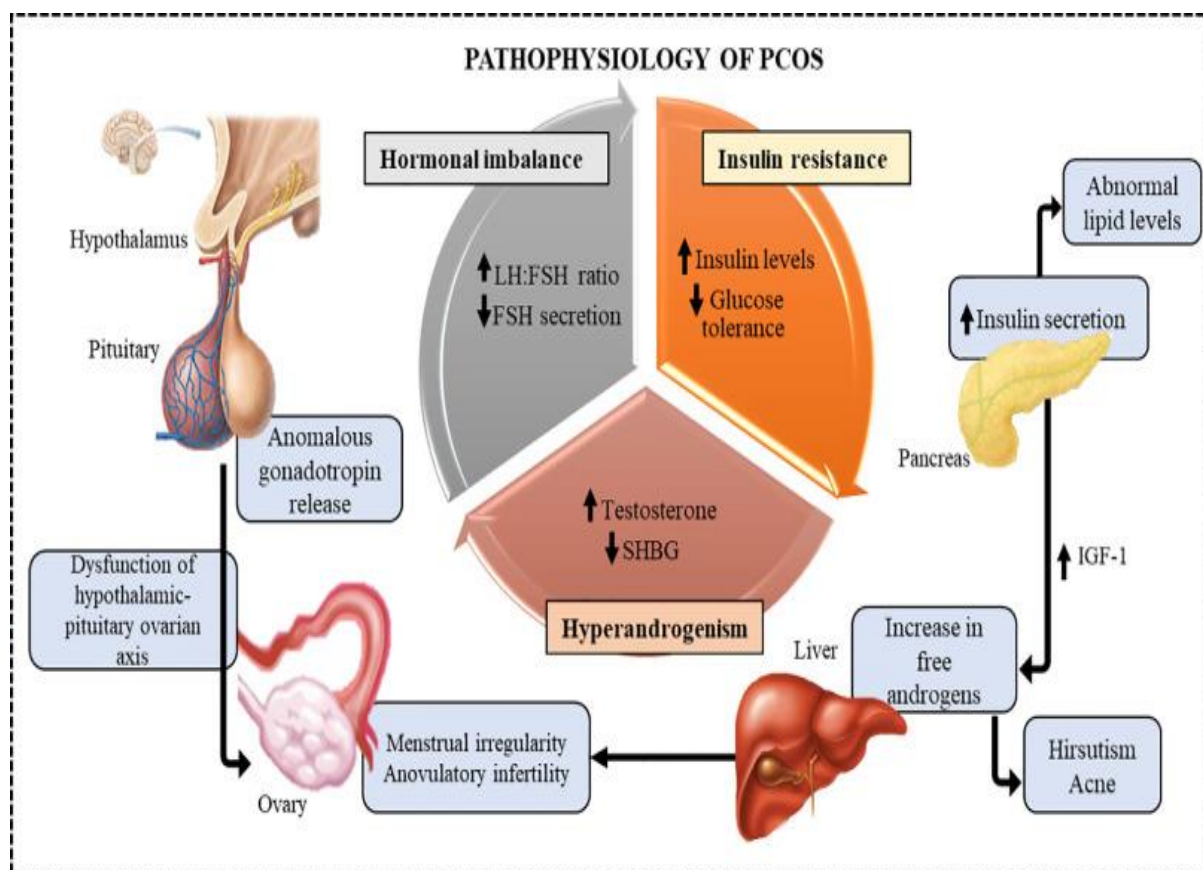


Fig 1. PATHOPHYSIOLOGY OF PCOS.

## ETIOLOGY AND PATHOPHYSIOLOGY

Polycystic ovary syndrome is a chronic disorder with unknown etiology that was first described in 1935 by Stein and Leventhal. It is a reproductive, heterogeneous and metabolic disorder. The prevalence of the disorder ranges from 8.7 to 17.8% in women of reproductive age. The first clinical manifestations of PCOS are present in adolescence. However, there is evidence that the disease has its origin in the intrauterine environment, indicating genetic involvement. Some studies including a study by Soter et al have demonstrated a definite influence of interleukin-6 and interleukin-10 gene polymorphisms, interferon-c and transforming growth factor-beta1 in the development of PCOS, although no clear pattern of inheritance has been identified. Other causal factors are epigenetic exposures, highlighting the association between intrauterine exposure and maternal androgens and phenotypes related to the syndrome. Ethnic variations in PCOS may be associated with environmental factors, such as socioeconomic conditions and lifestyle.

Despite a large number of research studies, pathogenesis of PCOS still needs further elucidation. However, some pathophysiological mechanisms are known, e.g. alterations in the

secretion of gonadotropin-releasing hormone, defect in androgen synthesis and development of insulin resistance. One of the numerous theories proposed to explain pathogenesis of the syndrome is the disturbance of the hypothalamic-pituitary axis, resulting in disarranged gonadotropin secretion by the hypothalamus with a consequent elevation of luteinizing hormone (LH) levels and normal and/or low follicle-stimulating hormone (FSH) levels.

A number of studies have also indicated that insulin resistance is the key pathophysiological element for development of the syndrome. Insulin acts synergistically with LH to increase androgen production in the theca cell of the ovary. Another site for androgen production is the adrenal cortex, due to abnormalities in cortical steroidogenesis promoted by stimulation of adrenocorticotrophic hormone. And these excess androgen levels, mainly testosterone, androstenedione and dehydroepiandrosterone sulfate, cause premature atresia of ovarian follicles, forming multiple cysts and an ovulation with persistent estrogen levels resulting from aromatization of androgens to estrogens without opposition of progesterone and associated with an increased risk of endometrial carcinoma.<sup>4</sup>

#### ❖ **Complications of PCOS / PCOD problem**

Every woman will think what happen to their body when they have PCOD or PCOS. Having higher-than-normal androgen levels can affect your health. These are the complications of PCOS or PCOD problem that require medical attention:

Abnormal uterine bleeding

Infertility or hypertension Infertility

Type 2 diabetes

Preterm labor and premature birth

Metabolic syndrome (risk for high blood sugar, high blood pressure, heart disease, diabetes, and stroke)

NASH (Non-alcoholic steatohepatitis)

Depression (Many women end up experiencing depression and anxiety due to unwanted hair growth and other symptoms)

Sleep apnea (More common in women who are overweight, causes repeated pauses in breathing during the night, which interrupt sleep)

Endometrial cancer (Due to thickened uterine lining)

Miscarriage (spontaneous loss of a pregnancy)<sup>5</sup>

### **Risk factors and preventive measures**

What factors increase the likelihood of developing PCOS? There are four main risk factors:

a. Genetics If a close family member, such as a sister or mother, has the condition, you have an increased, but not guaranteed, chance of developing PCOS.<sup>37,38</sup> Even without a family history of PCOS, there are other risk factors that can lead to its development.

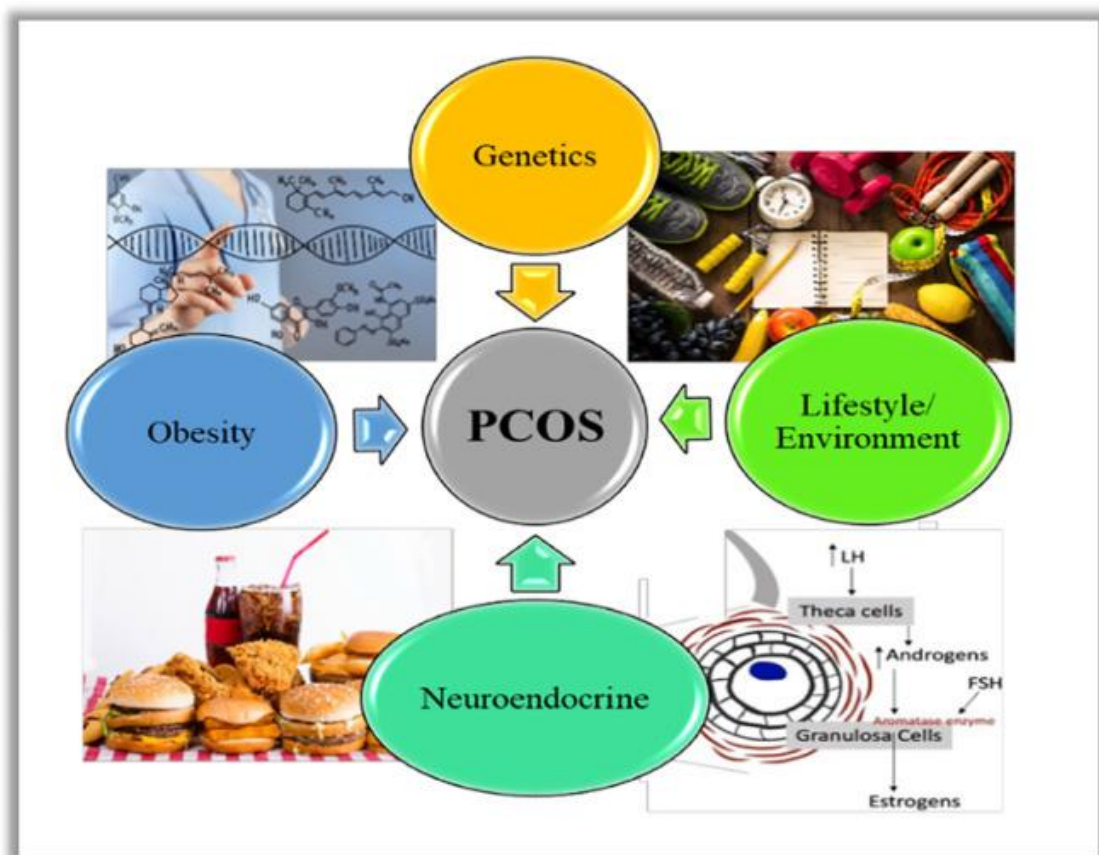
b. Diet Additionally, diet has been found to be a contributing factor for PCOS. Fats and proteins from one's diet can form advanced glycation end products (AGEs) when exposed to sugar in the bloodstream. These compounds are known to contribute to increased bodily stress and inflammation, which have been linked to diabetes and cardiovascular disease. PCOS patients already have an increased likelihood for metabolic syndrome, cardiovascular issues, and diabetes. Thus, it's best to limit exposure to AGEs. Animal-derived foods that are high in fat and protein are generally AGE-rich and prone to more AGE formation during cooking. In contrast, foods that are low on the glycemic index—such as vegetables, fruits, whole grains, and milk—contain relatively few AGEs, even after cooking.

c. Lifestyle Everyday habits greatly affect the development and severity of PCOS.

- Obesity is widely recognized as aggravating PCOS, so managing a healthy weight, especially abdominal circumference, is recommended.
- Exercise helps to reduce many PCOS symptoms, such as depression, inflammation, and excess weight. Aim to incorporate exercise into your lifestyle.<sup>41</sup> The Centers for Disease Control and Prevention (CDC) recommends 150 minutes (2 hours and 30 minutes) of moderate-intensity exercise per week or 75 minutes of high-intensity exercise per week and incorporating strength training 2 days per week.
- In addition to exercise, increase daily activity by taking the stairs, going on short walks, and stretching throughout the day. No matter the movement, stay consistent and choose an enjoyable activity.

• Women may want to limit inflammatory foods—such as dairy products, foods with gluten, and foods high in glycemic load, such as potatoes, white bread, and sugary desserts—as much as possible. But if those foods do not cause bodily aggravation, then there is no need to eliminate them completely.

d. Environmental exposure risks Environmental exposures to endocrine-disrupting chemicals may lead to female reproductive health issues, including PCOS. Research shows that endocrine-disrupting chemicals may pose the greatest risk during prenatal and early postnatal development, when organ systems are developing. Endocrine disrupting chemicals can be found in many of the everyday products we use, including some plastic bottles and containers, liners of metal food cans, detergents, flame retardants, food, toys, cosmetics, and pesticides. Limiting personal exposure to endocrine-disrupting chemicals may benefit reproductive health 6.



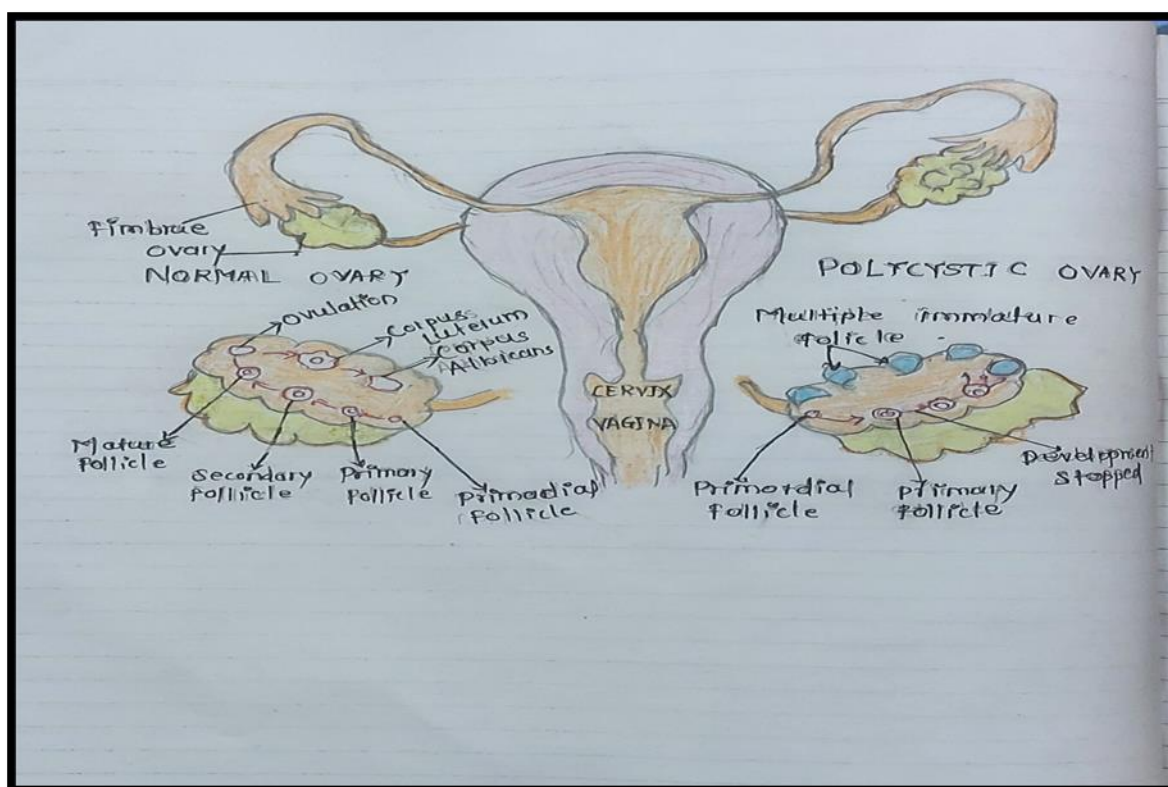
❖ **Difference between PCOD and PCOS.**

<b>PCOD</b>	<b>PCOS</b>
PCOD is a common disorder, 10% of world women population affected by it.	PCOS is a serious medical condition around 0.2% to 2.5% of world women population affected by it.
PCOD is a condition in which ovaries produce many immature or partially mature eggs, this happen due to poor lifestyle, obesity, stress and hormonal imbalance.	PCOS is a metabolic disorder and more severe form of PCOD can lead to anovulation where ovaries stop releasing eggs.
PCOD doesn't affect fertility in women, in this condition woman still can ovulate and become pregnant with little help, following medication can complete pregnancy.	PCOS seriously affects fertility in women. Due to PCOS woman cannot ovulate regularly, making them hard to get pregnant. If become pregnant, there is a risk of miscarriage, premature birth or complications in their pregnancy.
PCOD doesn't have any serious complications.	PCOS have serious complications such as type 2 diabetes, heart disease, high-blood pressure and endometrial cancer in later stage <sup>5</sup> .

Several studies highlighted the association between PCOS and gynecological cancers. Cancer risk increases in PCOS as a result of the hormonal disturbance and the prolonged an ovulatory state. A meta-analysis concluded: Women with PCOS have 3 times more risk than other women to develop endometrial cancer. Moreover, it is found that PCOS is associated with considerable stress because of the physical and psychological problems especially obesity and infertility. In fact, delayed diagnosis of PCOS is also associated with anxiety and depression.

Awareness of PCOS symptoms and complications is essential for early treatment and to prevent further serious complications of it. To the best of our knowledge, no previous similar studies were conducted on PCOS awareness. The aim of our study is to assess the level of knowledge of PCOS, clinical presentation, risk factors and complications among college girls, to identify factors that influenced the awareness, and to improve health care, and lower the treatment cost<sup>3</sup>.





## MATERIAL AND METHODS:

A population-based cross-sectional study was conducted about PCOS awareness. Team developed a 14 items research questionnaire specifically targeted to a woman of reproductive age (aged 18-22). First items for personal data, items about awareness and method of knowledge of PCOS in general, the rest of questions are about the awareness of PCOS clinical presentation, risk factors, and complications. Awareness questions answered by choosing a single answer from the three choices; yes, no, I do not know.

We tested the questionnaire data from gynecological consultant. Data were collected using paper and soft copy questionnaire. The paper questionnaires were distributed in colleges in Rajarambapu college of pharmacy Kasegaon. The soft copy questionnaire was designed using Google websites and other research articles. The PCOS and PCOD questionnaire was posted in English language. Participation in this open study was not restricted to PCOS patients; it is for all females within the assigned age group.

Questionnaires from none matching age group, i.e., above 22 or less than 18 were not used and questionnaires completed by female pharmacy graduates. the study did not require direct patient contact and medical record review only investigators were permitted to access the questionnaires responses of the study<sup>3</sup>.

## DISCUSSION:

PCOS is a chronic multisystem disorder, which is caused by endocrine abnormalities. It presents with a wide range of symptoms including: Irregular menstrual cycle, obesity, hirsutism, androgenisation, insulin resistance, and subfertility. PCOS is a potential for many long-term complications as breast cancer, cyclic vomiting syndrome, diabetes mellitus, and hypertension.

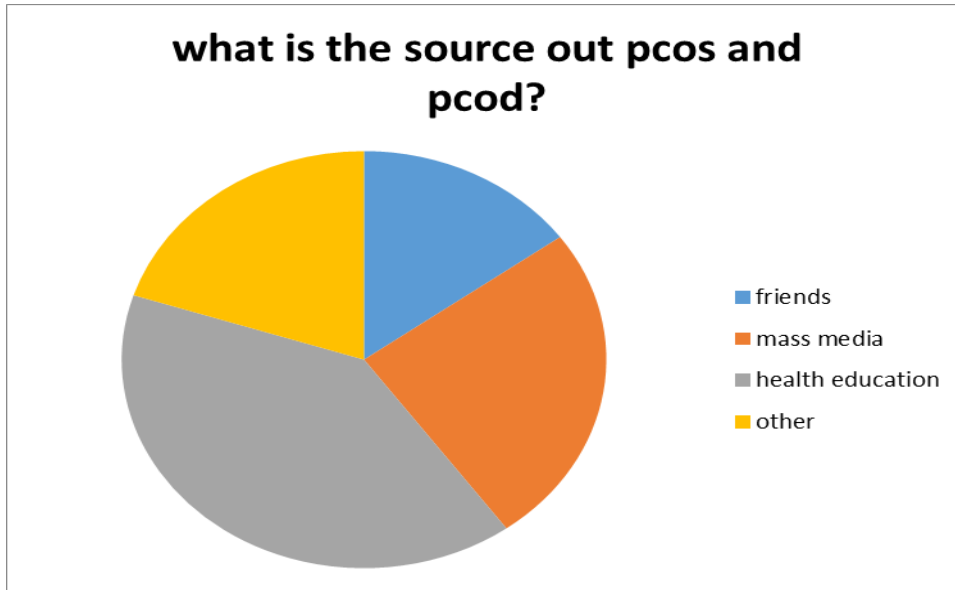
It is a very common disorder among women in reproductive age. In this study, we sought to address the level of awareness of PCOS and its most common symptoms, risk factors, and complication. In this study, a number of females included in the study had prior knowledge about PCOS. This level of awareness is considered satisfactory especially considering the large number of women participating in this study. To the best of our knowledge, this is the first study to evaluate the level of awareness of PCOS.

The source of knowledge was mostly from internet, followed almost equally by asking doctors or patients and the last used resource is reading, which gives us an impression about preferred method of gaining knowledge. In addition, most of studied female who have prior knowledge about PCOS have also knowledge about its most common symptoms as irregular menstruation, acne, hirsutism, decrease fertility, weight gain, psychological disturbance, anxiety, abortion, pelvic pain, breast cancer, and increase androgen release also they were aware of its effect on ovulation.

Some of the studied females were aware of the effect of doing excises, decreasing the weight, using contraceptives, and eating fruit and vegetables on reliving PCOS symptoms. Most participants were unaware of the long-term complications as hypertension, diabetes mellitus and cardiovascular abnormality. They were mostly unaware of its relationship to early puberty and inheritance as well<sup>4</sup>.

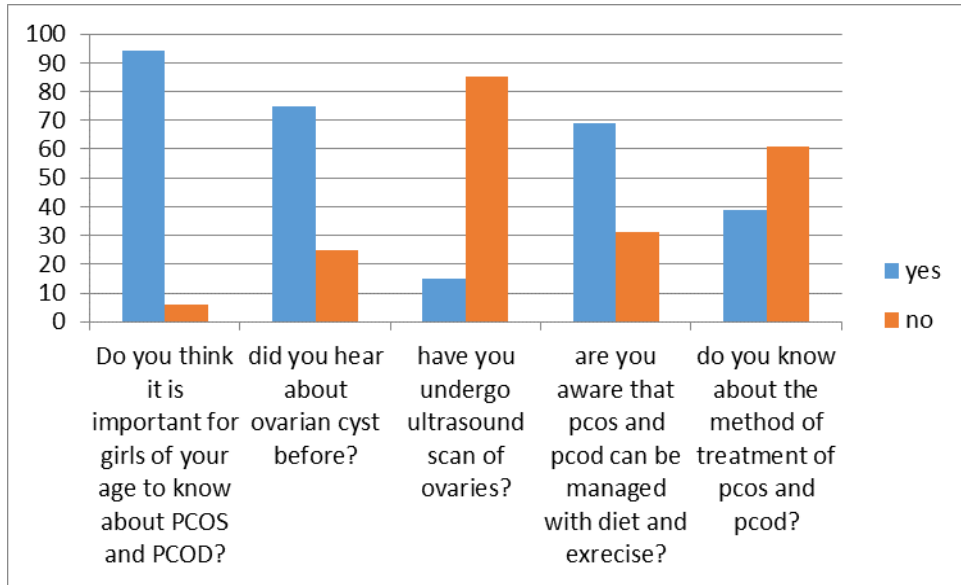
**RESULT OF SURVEY:**

Question	Mass media	friends	Health education	others
What is source of knowledge about pcos and pcod?	25	15	40	20

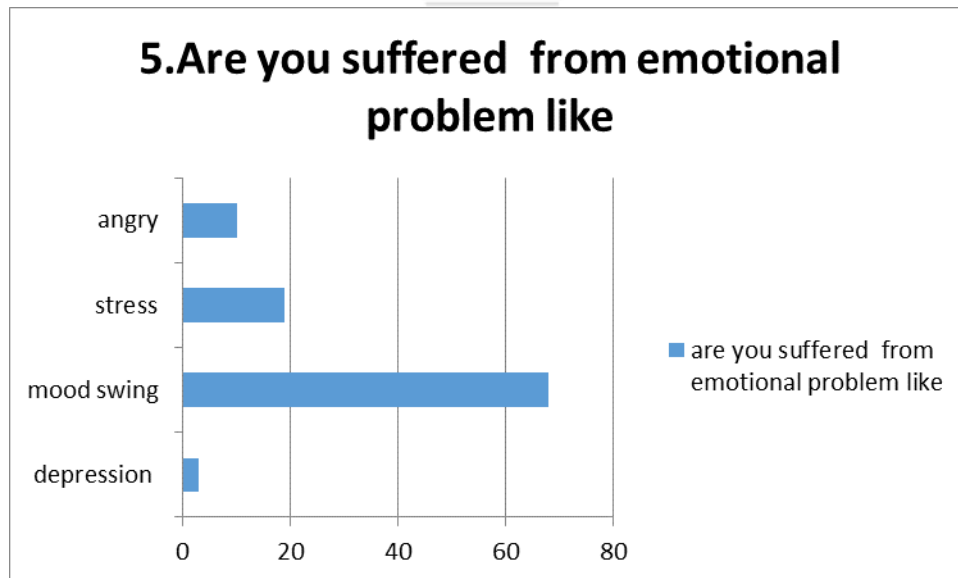
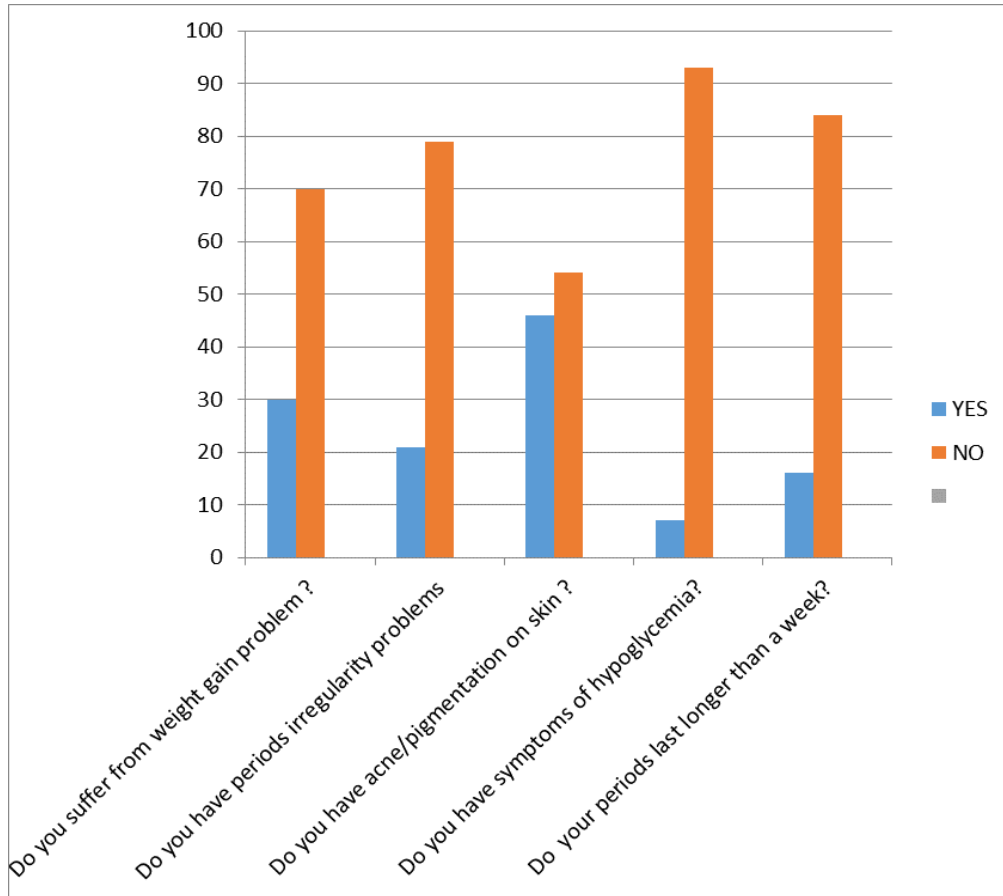


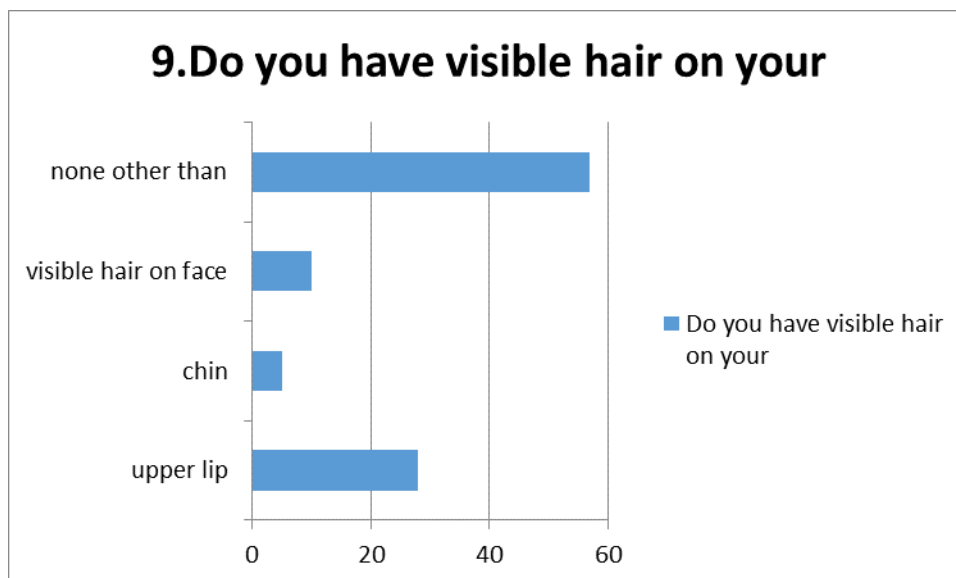
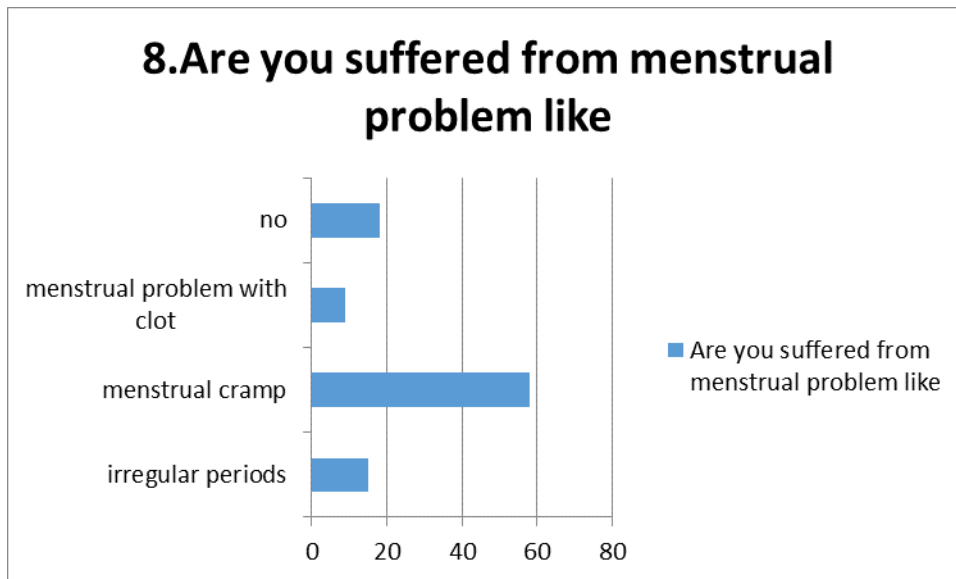
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QUEISTIONS	YES	NO
Do you think it is important for girls of your age to know about PCOS and PCOD?	94	6
Did you hear about ovarian cyst before?	75	25
Have you undergo ultrasound scan of ovaries?	15	85
Are you aware that PCOS and PCOD can be managed with diet and exercise?	69	31
Do you know about the method of treatment of PCOS and PCOD?	39	61



Questions	Yes	No
Do you suffer from weight gain problem?	30	70
Do you have period irregularity problem?	21	79
Do you have acne pigmentation on skin?	46	54
Do you have symptoms of hypoglycaemia?	7	93
Do you have periods last longer than a week?	16	84





#### CONCLUSION:

It is concluded that we have constructed and validated a simple clinical tool that is highly sensitive and specific for a diagnosis of PCOS and PCOD. Prevention of this disease and its consequences relies on increasing awareness at an early age of life. present study indicates awareness of PCOS and PCOD among college going female is necessary although females were aware that irregular or absent menses , facial acne, weight gain and abnormal hair growth are symptoms of PCOS and PCOD but increasing awareness for all other symptoms is also needed.

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