

**A STUDY ON KNOWLEDGE & AWARENESS OF POLYCYSTIC
OVARIAN SYNDROME AMONG FEMALE STUDENTS OF PUBLIC
AND PRIVATE MEDICAL COLLEGES IN DHAKA**

[This dissertation is submitted to the Department of Pharmacy, East West University in the partial fulfillment of the requirements for the Degree of Bachelor of Pharmacy]

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I, **Mastura Naz Shammi**, ID: 2013-3-70-063 hereby declare that the dissertation entitled “KNOWLEDGE & AWARENESS OF POLYCYSTIC OVARIAN SYNDROME AMONG MEDICALSTUDENTS OF PUBLIC AND PRIVATE MEDICAL COLLEGES IN DHAKA” submitted by me to the Department of Pharmacy, East West University and in the partial fulfillment of the requirement for the award of the degree Bachelor of Pharmacy, under the supervision and guidance of **Tilka Fannana**, Senior Lecturer, Department of Pharmacy, East West University, Dhaka, Bangladesh.

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**This Research paper is
Dedicated
To my Beloved Parents**

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List of Abbreviations

PCOS – Polycystic Ovarian Syndrome

LH -Luteinizing hormone

FSH – Follicle-stimulating hormone

GNRH- Gonadotropin-releasing hormone

SHBG- Sex Hormone Binding Globulin

DHEA - Dehydroepiandrosterone

GDM - Gestational diabetes

BMI - Body mass index (BMI)

LDL - Low-density lipoprotein

HDL - High-density lipoproteins

COCP - Combined oral contraceptive pill

OGTT- Oral glucose tolerance test

Abstract

Polycystic ovarian syndrome (PCOS) is an endocrine disorder which affects the adolescent girls. It affects 5% to 10% of women in their reproductive age. Awareness and accurate diagnosis is the first step in managing PCOS as it improves quality of life of the patient. The study was conducted to assess the knowledge on PCOS among the medical students. The study was performed on 400 female medical students among aged 18 to 28, from August 2017 to October, 2017 using a standard 3 pages structured questionnaire. This study is done by collecting data, containing different questions and then those data was analyzed by using Microsoft excel.

In my study, 400 female medical students were analyzed regarding the knowledge and awareness of PCOS. Students were mostly aged between 21-23 years (49.25%). Among 400 female medical students a majority of the population (66.94%) minimally aware about PCOS, 2.20% were very aware about PCOS, a majority of the population (48.87%) had no idea about PCOS. In this study maximum 22% population identified difficulty of pregnancy as symptoms of PCOS, 19% identified irregular periods and minimum 4% of population identified depression as symptoms of PCOS among study of population. Of the respondents, 76.75% perceived that infertility is a major complications, 10.25% population thought that endometrial cancer can arise from PCOS. In this study the prevalence of PCOS was 22.25% among 400 students. Among the PCOS affected population, 50.56% had family history of PCOS. In the study, maximum 43.82% patients were diagnosed by sonogram and minimum 14.61% patients were identified by androgen level. From the study, maximum 33.71% were identified with frustration and minimum 2.25% were experienced hopeless. From the study, maximum 6.65% patients were treated for infertility, minimum 1.2% patients received treatment for hirsutism. Of this study, maximum 82.02% patients had information of PCOS from doctor. In this study, In this study, maximum 55% population identified medication as a treatment option of PCOS. In the present study demonstrated the level of knowledge about PCOS was insufficient among medical students in Dhaka; consequently more educational programmes, conferences, awareness programmes, etc should be designed to provide comprehensive information and awareness on PCOS among the future doctors.

Key words: PCOS, awareness, medical students, knowledge.

Chapter-1

Introduction

1.1 Overview

Polycystic ovary syndrome (PCOS) is a prevalent, chronic and heterogeneous endocrine condition with reproductive, metabolic and psychological features. It is present 12% of women of reproductive age. PCOS affects about 10 million women in the world. It usually comes to attention after menarche in teenage girls or young adults who present with oligomenorrhea, hirsutism, infertility, and sometimes obesity. (Shorakae et al., 2014)

In 1935, Stein and Leventhal were the first to describe a condition consisting of amenorrhea, obesity and masculinizing symptoms that is now known as polycystic ovarian syndrome (PCOS). Although this condition is now recognized as the most common endocrine abnormality in women of reproductive age, there is still no universal consensus on diagnostic criteria for PCOS, and its etiology remains incompletely understood. (Lee and Rausch, 2012)

PCOS is common endocrine condition in which a woman's hormones are out of balance. It can cause problem with periods and make it difficult to pregnant. PCOS also may cause unwanted changes in the body. If it is not treated, over time it can lead to serious health problems, such as diabetes and heart disease. Most women with PCOS grow many small cysts on their ovaries. That is why it is called PCOS. The cysts are not harmful but lead to hormone imbalances (estrogen, progesterone). PCOS can cause problem with periods and make it difficult to pregnant.

There are 4 types of PCOS and they are insulin resistance PCOS, immune related PCOS, post-pill and environmental PCOS. The cause of PCOS is not fully understood but genetics may be a factor. PCOS can be passed down from either from patient mother's or father's side. Actually PCOS seems to run in families and chances of having in women are higher if they have family history of irregular periods or diabetes.

In PCOS the sex hormones get out of balance and the ovaries make a tiny amount of male sex hormones androgens. In PCOS, the ovaries making slightly more androgens and may cause to stop ovulation get acne, hirsutism. The body may have problem using insulin, called insulin resistance. When the body does not use insulin well, blood sugar level go up and this increases the chances of getting diabetes.

There are a number of ways to manage the symptoms and the impact of PCOS. To correct the menstrual cycle problems, birth control, uterine cancer and hirsutism hormonal therapy can be used. Oral contraceptive pills, patches and vaginal rings are used for hormone therapy. Metformin an insulin sensitizing agent is traditionally used for the treatment of diabetes in

PCOS patient. It can correct the metabolic and endrogenic problem associated with PCOS. Use of metformin has helped PCOS patients lose overweight, lower blood pressure and loss excess body hair after 2 to 3 months of treatment. Surgical option is laproscopy in PCOS patient.

PCOS affects between 8% and 20% of reproductive-age women worldwide. Because there is no universal definition of PCOS, the exact number of women in the world with PCOS is unknown. Most women are diagnosed during their twenties or thirties. (Dargham et al., 2017) In Bangladesh a study was carried out and they reported that most of the patients (92%) were 30-32 years old. Chief complaint of the patient was infertility, either primary(72%) or secondary(28%). 80% women had menstrual irregularities, 30% cases were overweight and 17% were obese. On pelvic ultrasonogram polycystic ovaries were found in 20% cases and 80% had normal ovaries. Thirty percent patient had LH/FSH ratio between 2.1-2.9, 32% had >3 and it was found normal in 38% of cases. (Khanam and Parvin, 2014)

PCOS is common, lifelong condition that appears to be increasing in prevalence with increasing obesity, yet remains largely undiagnosed, limiting opportunities for prevention and management. Screening and prevention of psychological and metabolic features are recommended, along with a focus on prevention of weight gain. (Shorakae et al., 2014)

1.2 Normal ovaries:

The ovaries are the female pelvic reproductive organs that house the ova and are also responsible for the production of sex hormones. They are paired organs located on either side of the uterus within the broad ligament below the uterine tube. The ovary is within the ovarian fossa, a space that is bound by the external iliac vessels, obliterated umbilical artery, and the ureter. The ovaries are responsible for housing and releasing ova, or eggs, necessary for reproduction. At birth, a female has approximately 1-2 million eggs, but only 300 of these eggs will ever become mature and be released for the purpose of fertilization. (Medscape, 2017)

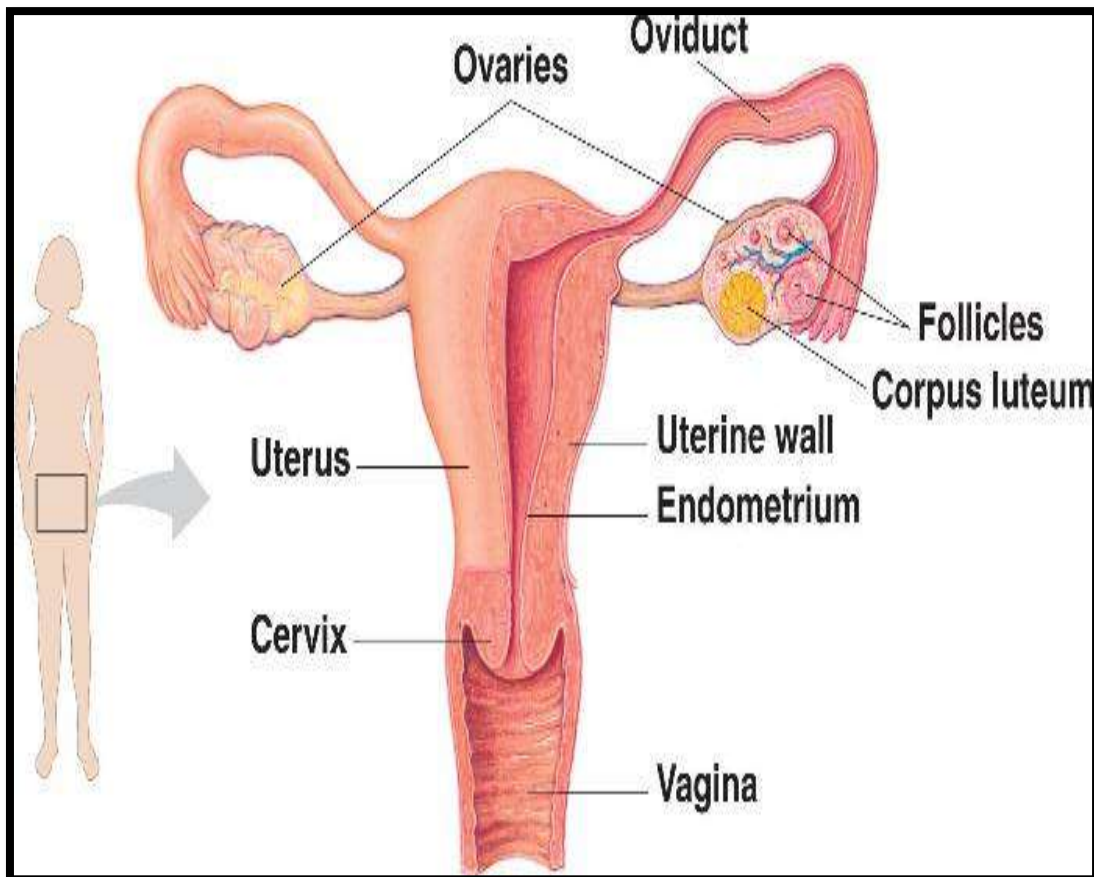


Figure 1.1 Ovaries anterior view (Adapted from Medscape, 2015)

1.2.1 Structure of the ovary

The ovaries are small, oval-shaped, and grayish in color, with an uneven surface. The actual size of an ovary depends on a woman's age and hormonal status, the ovaries, covered by a modified peritoneum, are approximately 3-5 cm in length during child bearing years. The ovary has 3 components;

Surface: The surface layer of the ovary is formed by simple cuboidal epithelium, known as germinal epithelium.

Cortex: The cortex of the ovary is largely comprised of a connective tissue stroma. It supports thousands of follicles. Each primordial follicle contains an oocyte surrounded by a single layer of follicular cells.

Medulla: The medulla is composed of supporting stroma and contains a rich neurovascular network which enters the hilum of ovary from the mesovarium.

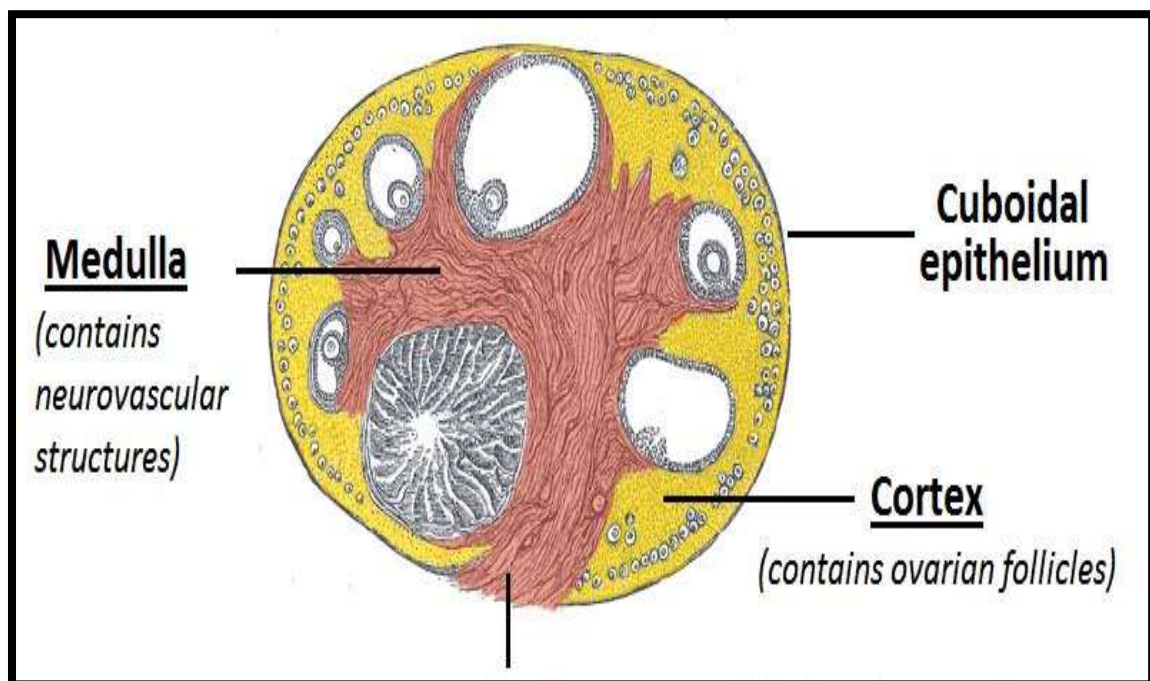


Figure1.2 Cross section of an ovary (Adapted from Teach MeAnatomy , 2016)

1.3 Polycystic ovary

Polycystic ovaries are characterized by the presence of many normal cysts around the surface of the ovaries. Cysts are quite small, ranging from 2 to 8mm. The affected ovaries are larger than the normal ovaries and their central substance is generally more dense. At ultrasound examination, the ovaries appear larger and denser, and cysts look like a necklace around the periphery of the ovary.

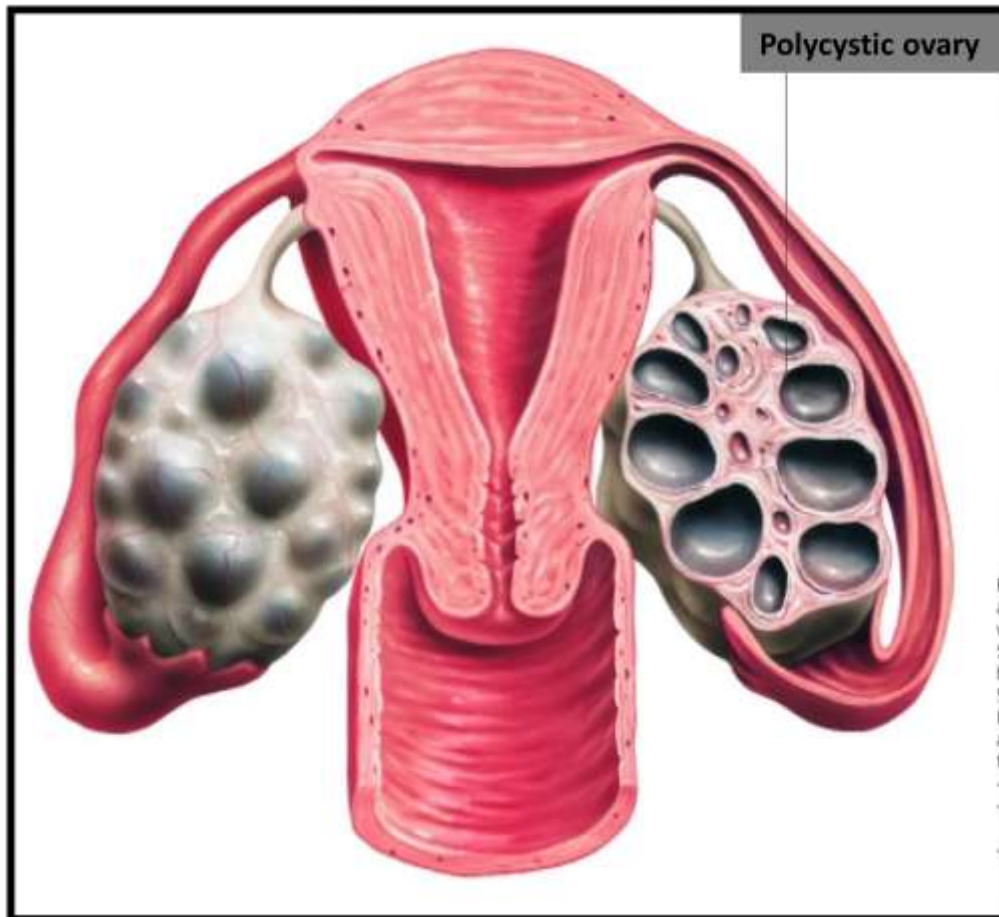


Figure 1.3 Polycystic ovary (Adapted from WebMD , 2015)

1.4 Pathophysiology of PCOS

1.4.1 Hypothalamic –pituitary compartment abnormality

Exact pathophysiology of PCOS is not clearly understood. The common biochemical feature of PCOS is overproduction of androgens. This results because abnormalities occur at every stage of the hypothalamic-pituitary-gonadal axis. Androgens are synthesized from cholesterol in ovarian theca cells, and this process is regulated by LH. The aromatase activity of granulosa cells is regulated by FSH, which determines how much estrogen is synthesized from androgenic precursors. When LH levels are elevated relative to FSH, the ovaries preferentially synthesize androgens. An increased GnRH pulse frequency causes the transcription of the beta subunit of LH over FSH, favoring the synthesis of androgens. Usually, the relative proportion of LH and FSH is controlled by GnRH. (Lee and Rausch, 2012)

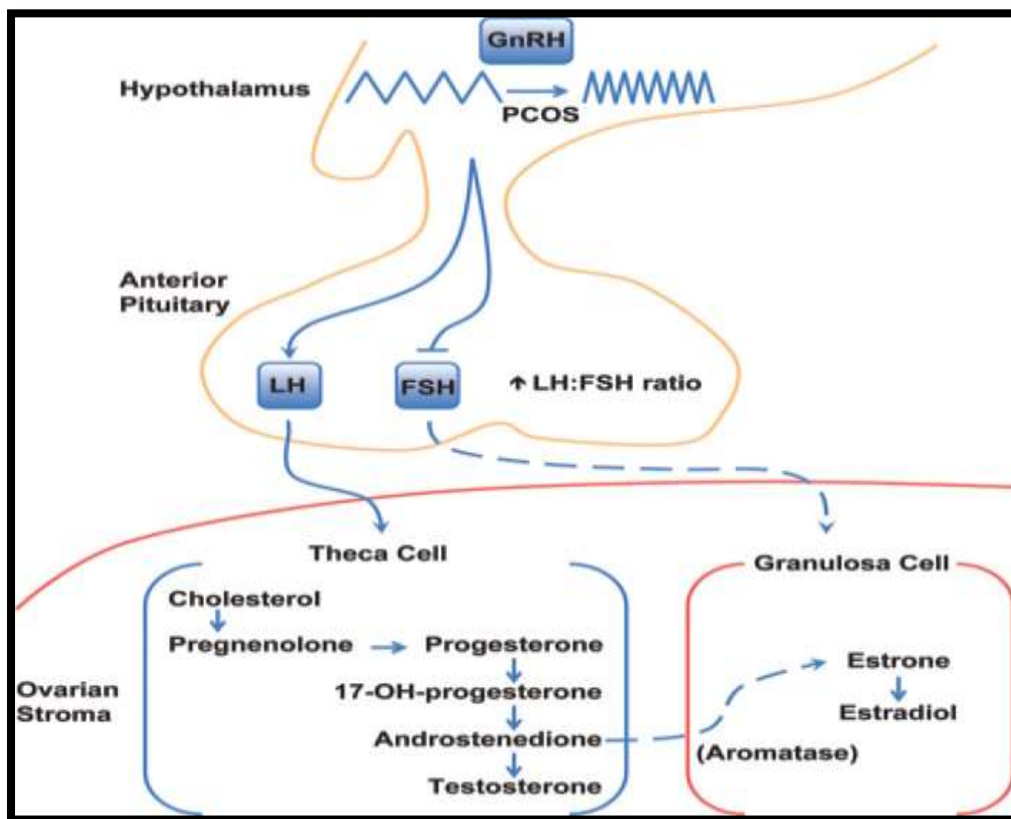


Figure 1.4.1 The hypothalamic-pituitary-gonadal axis in PCOS (Lee and Rausch, 2012)

1.4.2 The role of insulin resistance in PCOS

Insulin plays both direct and indirect role in the pathogenesis of hyperandrogenemia. In the ovary insulin synergistically act with LH and increase the androgen production in the theca cells. Insulin inhibit the hepatic synthesis of SHBG which increasing the amount of bioactive testosterone which increasing the effect of circulating androgens. The pathogenesis of ovulatory dysfunction is the result of hyperandrogenism.

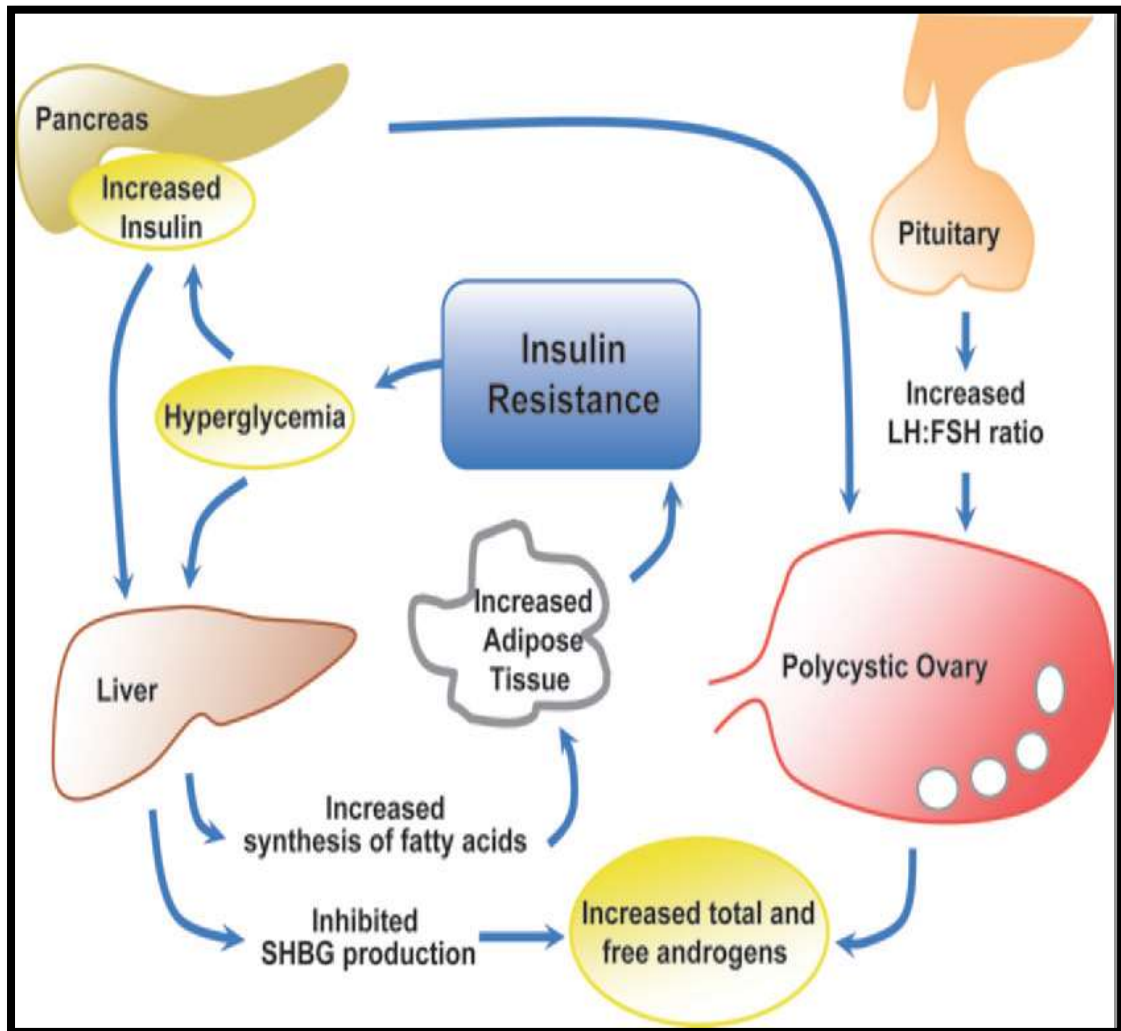


Figure 1.4.2 The role of insulin resistance in PCOS (Lee and Rausch, 2012)

1.5 Types of PCOS

There are four types of PCOS and they are:

- **Insulin Resistant PCOS**

This is the ‘classic PCOS’ patient, and also the most common. The culprit in the development of classic PCOS is insulin resistance – when the body becomes less responsive to insulin and blood sugars become imbalanced. High insulin and leptin impede ovulation and stimulate the ovaries to make testosterone.

- **Immune Related PCOS**

This second type of PCOS is due to chronic inflammation, which can be the result of many different causes. This inflammation impedes ovulation and disrupts hormone receptors, stimulating adrenal gland androgens like DHEA. Women with family or past medical history of other immune dysfunctions, like autoimmune conditions, may be more likely to develop this type of PCOS.

- **Post-Pill PCOS**

This type of PCOS is the most common and it is generally very responsive to natural treatment. For most women, a slow-to-restart period after stopping the birth control Pill will normalize within the first six months, but for others the suppression can last years and require treatment.

- **Environmental PCOS**

The final, and perhaps simplest, type of PCOS is one where there is a single environmental (or other hormonal) imbalance that is interfering with your body’s ability to ovulate on a regular schedule. It can take a bit of trial-and-error to determine the true cause of PCOS in these cases, but once found, patients respond very quickly to treatment. (Acubalance Wellness Centre, 2014)

1.6 Risk factor for PCOS

The main risk factor for PCOS is a family history of it. The chance of having it is higher if other women in family have it or have irregular periods. PCOS can be passed down from either mother's or father's side. The others factors are menstrual cycle disorder, family history of diabetes, family history of infertility, family history of diabetes.

1.7 Diagnosis criteria for PCOS

Two out of the four are following are required to make the diagnosis:

1. Oligo- or anovulation
2. Clinical and/or biochemical signs of hyperandrogenism
3. Polycystic ovaries (on ultrasound)
4. Excess androgen activity – measured via lab testing. (Of testosterone, DHEA, and androstenedione) or symptoms like acne and hair loss.

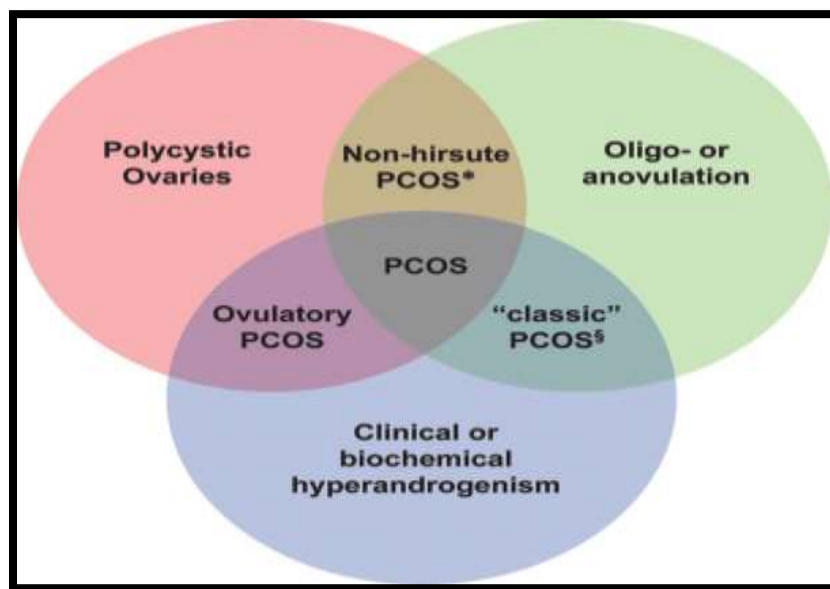


Figure 1.5 Venn diagram illustrates the Rotterdam criteria for PCOS. The diagnosis of PCOS requires two of three criteria to be met. (Lee and Rausch, 2012)

1.8 Symptoms of PCOS

Symptoms of PCOS start soon after a woman begins to menstruate. Symptoms can vary person to person. But the most common symptom is irregularities of period. The patient with PCOS may present complaining obesity, menstrual abnormalities in the form of oligomenorrhea or dysfunctional uterine bleeding and infertility. Presences of hirsutism, acne are common features. The other symptoms are hair-an syndrome, acanthosisnigrans, sleep apnea.

1.9 Health consequences of PCOS

The health consequence of PCOS is broad and extend beyond infertility. It is believed that insulin resistance is one of the main reason that related to other health consequences.

- **Reproductive consequences**

It is frequently associated with reproductive dysfunction, including anovulatory infertility and early pregnancy loss. It mainly included hyperandrogenism, anovulation resulting infertility. The most common cause of anovulation infertility is Hypersecretion of LH, hyperandrogenaemia and/or hyperinsulinaemia has been postulated as the possible underlying mechanism of early pregnancy loss in women with PCOS. Anovulatory infertility in PCOS women can be treated with insulin-sen PCOS. Patients with PCOS have risk of endometrial cancer, hyperinsulinaemia and T2DM. Fertility in women declines further with a BMI greater than 30-32kg per meter square and age more than 35 years. However fertility is not impaired in all pcos cases, and some women conceive without medical intervention, depending on the severity of the condition, hence contraception is still relevant. An association between PCOS and endometrial cancer, including obesity and anovulation with unopposed uterine estrogen exposure.(Shorakae et al .,2014)

- **Impaired glucose tolerance and diabetes**

PCOS is a major risk factor for type2 diabetes. Insulin resistance and abdominal obesity is thought to account for the type 2 diabetes in PCOS. There is also chance of developing gestational diabetes in women with PCOS. A number of risk factors, including family history, advanced age, increased BMI, and a history of GDM, has increased the risk of glucose intolerance in patients with PCOS .The national PCOS guideline highlights the key role of insulin resistance in lean women with PCOS, with exacerbation by obesity. PCOS is associated with pre diabetes, GDM and T2DM and these occurs at young age. PCOS is

recognized by the international diabetes federation as a risk factor T2DM. It is well known that obesity is observed in about 60% of women with PCOS. The central distribution of fat though is not dependent to BMI and actually is associated with higher insulin concentrations. Independent of obesity, the presence of a defect in insulin action which amplifies LH stimulated androgen secretion from thecal cells, has been well established. The key underlying abnormality that leads to later development of impaired glucose tolerance appears to be insulin resistance. It is reported that more than 20% of obese women with PCOS will have impaired glucose tolerance after the age of 30. Evidence demonstrates that the prevalence of type 2 diabetes in women diagnosed with PCOS is 7 times higher than controls (15% to 2% respectively). Insulin resistance combined with abdominal obesity is thought to account for the higher prevalence of type 2 diabetes in PCOS. However, the risk of developing type 2 diabetes is also increased in non-obese women with PCOS. Thus PCOS is an independent risk factor for type 2 diabetes in middle age. The majority of women under 45 with type 2 diabetes are also diagnosed with PCOS. Thus it is not surprising that there is a concomitant increased risk of gestational diabetes to these women. The risk is believed to be much greater in women with PCOS who are also obese and who need ovulation induction in order to conceive. Also women with gestational diabetes have been found with high prevalence of PCOS after pregnancy. (Mahalingaiah and Kandarakis, 2015)

- **Cardiovascular disease and hypertension**

There are two mechanisms of insulin resistance, and these contribute significantly to the higher risk of cardiovascular diseases in PCOS affected women. Among them one is atherogenic and others are adverse effect of the lipoprotein profile. Affected women have more chances to develop cardiovascular disease. Women with PCOS have high concentration of serum tri glycerides, and LDL and low concentration of HDL. On the other hand serum plasminogen activator inhibitor 1 concentration are also increased and this leads to impaired fibrinolysis that directly affect vascular tissue causing changes associated with coronary heart disease. There is a relationship between insulin plasma level and blood pressure with regarding the hypertension. There is a chance of having preeclampsia in pregnant women with affected PCOS. (Blagojevic et al., 2017)

- **Breast cancer**

Women with PCOS also may be at higher risk for breast cancer. Obesity, hyperandrogenism, and infertility are associated with the development of breast cancer. Small a lack of ovulation (anovulation), as occurs with PCOS, is linked with a risk of breast cancer that is three to four times that of women without anovulation. Obesity, hyperandrogenism, and infertility are associated with the development of breast cancer. There is a positive association between PCOS and the presences of family history of breast cancer.

- **Endometrial cancer**

Women with PCOS have higher risk of developing endometrial hyperplasia and carcinoma. Obesity, long-term use of estrogens, infertility, hypertension and diabetes. Endometrial hyperplasia is the precursor of adenocarcinoma but the true risk of endometrial carcinoma in women diagnosed with PCOS has not been clearly defined yet. The risk of cancer of the endometrium , the inside lining of the uterus, is three times as high for women with PCOS as it is for other women. Irregular periods, or a lack of periods, can cause the endometrium to build up and become thick. This thickening can lead to endometrial cancer.

- **Ovarian cancer**

There might be a connection between PCOS and increased risk of ovarian cancer. The risk appears to be increased in multiple ovulations with early menarche and late menopause. There is a connection between PCOS and increased risk of ovarian cancer. The risk appears to be increased in nulliparous women (multiple ovulations), with early menarche and late menopause. Without any evidence based data to support this theory, it may be that inducing multiple ovulations in women with infertility will increase their risk. So, although women with PCOS are expected to be in low risk groups for developing ovarian cancer due to their life time reduced ovulation rate, by using ovulation induction treatments and inducing multifollicular ovulations theoretically an imbalance to their risk for ovarian cancer will be technically created

There are only a few studies addressing the possibility of association of polycystic ovaries and ovarian cancer with conflicting evidence. Large Danish studies suggest that infertility on its own increases the risk of borderline and invasive ovarian tumors

- **Sexuality in women with PCOS**

Polycystic ovary syndrome is characterized by a variety of hormonal and body changes including obesity, hirsutism, acne, insulin resistance, hyperinsulinemia, hyperprolactinemia, inadequate gonadotropin secretion and hyperandrogenism. This alteration can affect sexuality of a woman with PCOS, however data on sexual function and the sexuality of women with PCOS are scant and contradictory. Although testosterone levels increase PCOS, which would suggest a highly libido hyperandrogenism and hirsutism have been found to decrease sexual desire. There is a observation which was negative of hirsutism on general wellbeing and marital sexual life and concluded that PCOS decreased the quality of life and marital sexual functioning of the affected women. Women with PCOS were significantly less satisfied with their sexual life and less attractive than their healthy peer. (Kowalczyk et al., 2015)

1.10 Psychological consequences

The women with PCOS having higher prevalence of psychiatric disorders and increased emotional distress. In fact many studies have shown the prevalence of anxiety and depression being two to four or even eight times higher in PCOS affected woman. In addition to anxiety and depression, the woman with PCOS also present decreased body dissatisfaction and low self esteem .Alarmingly ,as reported in recent study, although the emotional burden coincides with PCOS, neither patient with PCOS nor general practitioners consider psychological distress as one of the key characteristics of PCOS, which might reflect unawareness of this common comorbidity. Several factors have been suggested to promote psychological distress in women with PCOS, including infertility, BMI, metabolic disorder, hyperandrogenism. Concerning isolated PCOS symptoms hirsutism is known to be associated with low self esteem, depression and anxiety. Lack of effective treatment burden the women further. So far, only few data exist on the effect of isolated menstrual disorders on psychological distress outside the context of menopause, and only few data exist on the role of consultation and awareness of the syndrome on anxiety and depressive symptoms. (Karjulaet al., 2017)

1.11 Diagnosis procedure of PCOS

- **Hormonal investigation:**

Usually blood tests can be used to measuring the level of FSH, LH, and male hormone. A male hormone precursor is often raised in PCOS. This is called dihydroepiandrosterone sulphate (DHEAS) and is one of the most commonly elevated male hormones in PCOS. Symptoms of male hormone excess are more important than measuring blood levels of male hormone. A significant number of patients with PCOS will have a reversal of the ratio of the FSH and LH levels present in their blood. Normally the FSH level is higher than LH in normal women which are opposite for the PCOS affected women.

- **Ultrasound scans:**

Patients with PCOS have characteristic findings when a scan (often transvaginal) is performed of their ovaries. The little developing follicles usually sit under the surface of the ovary but do not invade the centre of the ovary. These follicles (which can look like black holes on ultrasound) are usually about 6 to 10 mm in diameter and form a ring around the surface of the ovary. A solid white centre can be seen to the ovary. This sign is called the pearl string sign because it looks like a string of black pearls around a white neck. Polycystic ovaries may also seem increased in size on ultrasound scan.

- **Pelvic laparoscopy**

Pelvic laparoscopy is used to determine the growth of cysts in ovaries. Many patients with PCOS, particularly those who are having trouble becoming pregnant will have a laparoscopy. A laparoscopy is an operation whereby the patient is given a short general anaesthetic, a small cut is made in the umbilicus, and a telescope is inserted to look at the pelvic contents including the uterus, tubes and ovaries.

At laparoscopy PCOS ovaries look rather like ping-pong balls. The white capsule of the ovary is thickened and the ovary is often very rounded. At the laparoscopy, checks will also be made to assess the health of the fallopian tubes and to look for any associated endometriosis.

- **Hysteroscopy**

Hysteroscopy is an operation whereby a fine telescope is used to look inside the cavity of the womb (uterus). This is particularly important where the patient has had significant abnormal bleeding. Abnormal areas in the uterus can be seen and specific biopsies taken to assess for cancerous or pre-cancerous changes.

- **High lipid profile**

High lipid profile is measure to assess the amount of cholesterol in blood. PCOS affected women have more LDL than HDL. High amount of LDL is associated with cardiovascular diseases.

- **Fasting glucose tests**

Abnormalities of blood sugar (serum glucose) and insulin are quite common in PCOS. There are several rather common blood tests to assess blood sugar status and the possibility of insulin resistance. One of the method is fasting glucose level. Fasting glucose tests is perform to measure the blood sugar level in the body. Women affected with PCOS have higher amount of blood glucose level. Abnormalities of blood sugar (serum glucose) and insulin are quite common in PCOS.

- **Thyroid function test**

Thyroid function test is perform to determine the amount of thyroid hormone in the body. Women with PCOS have higher thyroid level and are also more likely to have hypothyroidism.

1.12 Treatment and management strategies

There is no cure for PCOS but controlling it lowers patient's risks of infertility, miscarriage, diabetes, heart disease, and uterine cancer. Treatment depends on symptoms. Self management approach is most important. Therapy should focused both short term and long term metabolic, reproductive and psychological features.

- **Insulin resistance**

Classic treatment for insulin resistance includes peripheral insulin sensitizers, such as metformin, which decreases hepatic gluconeogenesis, increases peripheral glucose uptake and decreases hepatic gluconeogenesis, increases peripheral glucose uptake and decreases gastrointestinal absorption of glucose. Metformin has beneficial effects on inflammation and

cardiovascular risk profile, such as in endothelium dependent vasodilation, endothelin -1, CRP ,advanced glycosylation, and adhesion molecules. Treatment of insulin resistance with thiazolidinediones is associated with a reduction in serum androgens and may also have beneficial effects at the level of ovarian steroidogenesis.

- **Dyslipidemia**

Abnormalities in lipid metabolism and fasting lipid profiles in women with PCOS are variable due to combination in women with PCOS are variable are due to combination of insulin resistance ,obesity, with a additional modification by diet ,amount of exercise. The general trend is lowering of HDL, elevation of total cholesterol, LDL and glycerides. Oxidization of LDL as an early marker of altered metabolism in young women. Lean women with PCOS androgen have lipid profile abnormalities compared to normal women of lowered LDL.

- **Cardiometabolic risk**

The patient with overweight is in high risk of cardio metabolic. Metformin helps to reduce weight. In order to reduce the risk of heart disease in PCOS, it's important to manage and control the many risk factors associated with heart disease that become present in PCOS. For one, it's important that manage weight. Being obese not only increases the risk of heart disease, but it can contribute to other risk factors for heart disease, too. Therefore, stick with a healthy diet and exercise regularly in order to keep weight within a healthy range. diet should be low in sodium and saturated fat as these two components increase blood pressure and lead to cholesterol as well – two other heart disease risk factors that should be managed, too.

- **Obesity management and prevention**

Women with PCOS are more prone to weight gain. There is a bidirectional relationship between PCOS and obesity. To reduce obesity lifestyle modification remains first line treatment for PCOS. Management should be focused both on prevention of weight gain and prevention on excess weight gain. An oral glucose test and lipid level should be maintained regularly, generally two yearly. Currently fasting glucose level has been shown to be inaccurate in PCOS, with an OGTT recommended. A healthy diet with caloric restriction and exercise is the best first line treatment to prevent weight gain and achieve weight gain. General recommendation include 150 min of exercise weekly to achieve modest goal.(5%

weight loss). Among women with PCOS and excess weight, a reduction of as little as 5% of total body weight has been shown to improve outcomes. (Thomson et al., 2011)

- **Infertility**

May include clomiphene, metformin, gonadotrpins, aromatase inhibitors, surgery and in vitro fertilisation.

- **Surgical options**

which include ovarian wedge resection, laser surgery, laparoscopy. Laparoscopic ovarian drilling is done for cases found resistant to medical therapy .Bariatric surgery may be indicated in some PCOS women who are morbidly obese.

- **Hirsutism**

Professional cosmetic therapy can be used. Usually laser treatment is recommended. A combination of COCP with antiandrogen can be administered to treat this condition. Anti-androgen should be administered with COCP because of anti-androgenic effect in pregnancy

- **Oligomenorrhea**

Life style should be changed. Combined contraceptive pill can be used or cyclic progesterone and metformine can be used to improve ovulation and menstrual cyclicity.

Table1. 1 Targeted treatment options for polycystic ovary syndrome

<p>Oligomenorrhoea/amenorrhoea</p> <p>Lifestyle change (5–10% weight loss + structured exercise)</p> <ul style="list-style-type: none"> • Combined oral contraceptive pill (low oestrogen doses, eg. 20 µg may have less impact on insulin resistance) • Cyclic progestins (eg. 10 mg medroxyprogesterone acetate 10–14 days every 2–3 months) • Metformin (improves ovulation and menstrual cyclicity)
<p>Hirsutism</p> <p>Self-administered and professional cosmetic therapy is first line (laser is recommended)</p>
<p>Pharmacological therapy</p> <ul style="list-style-type: none"> • If cosmetic treatment is ineffective/inaccessible/unaffordable • Should be trialled for at least 6 months before making changes in dose or medication • Primary therapy is the COCP (monitor glucose tolerance in those at risk of diabetes)

- Anti-androgen monotherapy (eg. Spironolactone) should not be used without adequate contraception
- Combination therapy – if 3–6 months of COCP is ineffective, add anti-androgen to COCP (daily spironolactone, and if >50 mg twice daily)

Infertility:

- smoking cessation, optimal weight, exercise and folate supplementation
- age-related decline in fertility needs to be encouraged.
- Infertility therapies may include clomiphene, metformin, gonadotropins, aromatase inhibitors, surgery and in vitro fertilization

(Shorakae et al., 2014)

• **Prevention for metabolic risk management In PCOS**

- smoking cessation
- Anthropometric factors including weight, BMI and waist should be monitored.
- Lipid profile every 2 years should be measured if normal and every year if abnormal and/or overweight or obese. The most common abnormalities are low high-density lipoprotein cholesterol (HDL-C) and high triglycerides
- BP should be measured annually if BMI less than 25 kg/m² or at every visit if BMI is more than 25 kg/m²
- Pre-diabetes (impaired fasting glucose and impaired glucose tolerance) and diabetes should be screened from a young age, especially preconception and early in pregnancy.
- The national guideline recommends an oral glucose tolerance (OGTT) test every 2 years in all women and every year in those with additional risks for diabetes (age, ethnicity, parental history of diabetes, history of high glucose levels, smoking and use of oral contraceptive pill. (Shorakae et al., 2014)

• **Reproductive health**

Primary steps for fertility management include prevention of weight gain, intensive lifestyle programme with caloric restriction, regular exercise and early family initiation. To induce ovulation clomiphene citrate, metformin, metformin and gonadotropin can be administered. For irregular menstruation COCP is effective in achieving menstrual cycle regularity. Providing contraception and controlling hirsutism may be a negative impact on insulin resistance. For this low dose COCP may be preferred.

- **Psychological health**

Management of psychological condition is needed to enable lifestyle management and depression in women with PCOS. For depression and anxiety the national health guideline recommends emotional health screening. Use of motivational interviewing strategies into the counselling sessions have been proven to enhance participant motivation in life style modification programmes. Techniques such as relaxation and cognitive behavioural therapy can be used to treat stress in women with PCOS.

1.13 Adverse effect of the common treatment of PCOS

The common treatment of PCOS depends on the woman’s goal for therapy. lifestyle modifications is often used to treat the metabolic consequences of PCOS. Paharmacological agents such as metformin, oral contraceptive pills, andantiandrogen agents are also frequently used. Metformin is associated with fatal and nonfatalic acidosis even though the incidence ranges from 1 to 17 cases per 1000,000 patients-years. OCPs have been associated with hepatic toxicity that could be fatal. The risk and nature of these side effects must be considered when choosing therapies.(Domecq et al., 2013)

1.14 Prevalence of PCOS

Polycystic ovary syndrome (PCOS) is the most common endocrine disorder in women of reproductive age and is the most common cause of infertility due to anovulation. There is no single criterion for the diagnosis of this. PCOS affects between 8% and 20% of reproductive-age women worldwide. Because there is no universal definition of PCOS, the exact number of women in the world with PCOS is unknown. Most women are diagnosed during their twenties or thirties. The prevalence of PCOS in different countries are given below-

Table1. 2 Prevalence of PCOS in different countries

Country	Extrapolated prevalence	Population estimated used
India	26,626,765	1,065,070,607
Bangladesh	3,533,511	141,340,476
Bhutan	54,639	2,185,569
Pakistan	3,979,908	159,196,336
Srilanka	497,629	19,905,165
Malaysia	588,062	23,522,482

Country	Extrapolated prevalence	Population estimated used
Singapore	108,847	4,353,893
USA	7,341,385	293,655,405
Canada	812,696	32,507,874
Brazil	4,602,527	184,101,109
Denmark	135,334	5,413,392
Sweden	224,660	8,986,400
Finland	130,362	5,214,512
United kingdom	1,506,767	60,270,708
Austria	204,369	8,174,762
Germany	2,060,615	82,424,609
Russia	3,599,351	143,974,059
Portugal	263,103	10,524,145
Spain	1,007,019	40,280,780
Greece	266,188	10,647,529

(Right Diagnosis, 2017)

1.14.1 PCOS in Bangladesh

In Bangladesh, polycystic ovarian syndrome (PCOS) is one of the most common endocrine disorders of reproductive-age women. There are few studies have done for PCOS.

A study was carried out at Bangabandhu Sheikh Mujib Medical University from January 2008 to march 2009, on 50 women with PCOS. Most common age was 21 to 25 years (44%), mean BMI 27.10 kg/m², menstrual cycle irregularity 80%, oligomenorrhoea 28%, dysmenorrhoea 18%, nulliparity 90%, history of abortion 10%, acne in 52%, hirsutism in 50%, and per vaginal findings were anteverted uterus 100%, free fornices 98% and healthy cervix 94%. 50 women with PCOS showed low(<2.8mIU/ml), serum FSH in 2%, raised (>14.7mLU/ml) serum LH in 56%, raised(<7.8mml/L) (blood sugar 2 hour after 75g glucose load) in 30%, raised (>25 ng/ml) serum prolactin in 14%, raised (>4 IU/ml) serum TSH in 2%, and andultrasonogram of lower abdomen showed 100% evidence of polycystic ovaries. (Anwary et al., 2009)

Another study was carried out at in combined military hospital at Jessore, Rangpur and Ghatail. Most of the patients (92%) were 30-32 years old. Chief complaint of the patient was infertility, either primary(72%) or secondary(28%). 80% women had menstrual

irregularities,30% cases were overweight and 17% were obese. On pelvic ultrasonogram polycystic ovaries were found in 20% cases and 80% had normal ovaries. Thirty percent patient had LH/FSH ratio between 2.1-2-9, 32% had>3 and it was found normal in 38% o the presentation of the patients with PCOS. It is emphasised that PCOS is a syndrome with nosignificantly single diagnostic criterion (such as hyperandrogenism or polycystic ovaries) which is sufficient for clinical diagnosis cases. (Khanam and Parvin,2014)

There is another study which was conducted at the Department of Obstetrics and Gynecology and Biomedical Research Group, BIRDEM hospital during the period of January 2006- Decemember 2008. A total number of 103 women with PCOS of reproductive age (15-40 years) were included in the study. An informed consent was obtained from all the participants. Out of 103 study women 50 (48.5%) had family history of diabetes. Among 103 women with PCOS, 30 (29.1%) showed impaired glucose tolerance (OGTT value: 7.8-11.0 mmol/L), 5 (4.9%) were T2DM (fasting blood sugar >7.0, OGTT value >11.1mmol/L) and 68 (66%) showed normal glucose tolerance (OGTT value <7.8 mmol/L). In the present study on 103 women with PCOS, 29.1% had IGT and 4.9% had diabetes before reaching their 4th decade of life.(Laila et al., 2016)

Chapter-2

Literature review

2.1 Survey of Poly Cystic Ovarian Disease (PCOD) Among The Girl Students of Bishop Heber College, Trichirapalli, Tamil Nadu India

The aim of this study was to assess the knowledge about PCOS among the female students of Bishop Heber College. The study was performed among the students of the college. , the study population represented a random sample of female students (252 Students) in the college and age group was between 18-31yrs. The study period was five months from November 2015 to March 2016. PCOS was diagnosed by using a questionnaire with Rotterdam's criteria and the prevalence was found to be 7.14%. This study definitely created awareness among the adolescent college girls about PCOS. Awareness would help to modify life style and to have better reproductive life later. This study they identified the adolescents with risk for developing PCOS. (Nivetha and Susan, 2016)

2.2 An Interventional Study on Effectiveness of Structured Education Programme in Improving the Knowledge of Polycystic Ovarian Syndrome among Female Students of Ras Al Khaimah Medical & Health Sciences University, UAE

The objective of this study was to assess the effectiveness of structured education programme on the knowledge of PCOS among female university students. A validated questionnaire was administered to all the 244 participants to assess the baseline knowledge. The post intervention knowledge scores were assessed by administration of questionnaire again following a structured education programme on PCOS. A statistically significant difference was observed between pre and post intervention knowledge scores with p value 0.000. The knowledge of participants was improved through structured education programme that can play a vital role in prevention and early diagnosis of PCOS. This might also help in effective management of disease thereby preventing many long term complications. (Atiqulla et al., 2016)

2.3 Effect of educational program on the level of knowledge regarding polycystic ovarian syndrome among adolescent girls

The objective of this study was to evaluate the effect of educational program on the level of knowledge regarding PCOS among adolescent girls. This study was conducted at the Faculty of Nursing at Minia University using quasi experimental research design on ninety six female students. Interviewing questionnaire and knowledge assessment tool (pre/post educational program) are used for data collection. After the educational program, majority (94.69%, 95.85%, 94.79%, 97.31%, 95.42%) of the students had corrected knowledge regarding to diagnosis, causes, risk factors, complications and management respectively after education program. Majority (92.7%) of the students had good knowledge, average knowledge observed on the (6.25%) from student and only (1.04%) had poor knowledge after educational program. Based on the results of the present study it can be concluded that, before utilization of educational sessions, most of the students (84.4%) had poor knowledge regarding polycystic ovarian syndrome. After the educational sessions there was enhancement of knowledge score on polycystic ovarian syndrome. (Mohamed, 2016)

2.4 PCOS: Symptoms and Awareness in Urban Pakistani Women

The study was done on one hundred and seventy seven women who were either seeking education in a university. A small portion of their of their subjects were educated house wives. The collected data was then interpreted to find the prevalence of symptoms and awareness about PCOS. 36.7%out of 177 subjects had hirsutism. Regarding menstruation 14% had some sort of irregularity. 9% women had oligomenorrhoea, 3% women had amenorrhoea. . On the whole 10% were familiar with PCOS. The main objective of this study was to create awareness among women and spreading knowledge. (Gul et al., 2014)

2.5 Awareness of polycystic ovarian syndrome among Saudi females

The purpose of this study was to assess the level of knowledge of PCOS, clinical presentation, risk factors and complications among Saudi female's population, to identify factors that influenced the awareness, and to improve health care and lower the treatment cost. Cross-sectional study was conducted in Saudi Arabia, in 2016, about PCOS awareness, using paper and soft copy. Total number of participants was 2000. The level of awareness of PCOS in this study was 56.7%. Among them 15.3% were PCOS patient, 21.3% have known about PCOS via internet, then patient, doctors, and books, respectively. Among aware females, the majority were aware of symptoms pertaining to endocrine disorders, contraception intake, and a healthy diet. In contrast, most of them were unaware of the relationship between it and occurrence of chronic diseases, early puberty, heart diseases, and

inheritance. The level of awareness of PCOS was significantly related to higher education, and women with health college qualifications. There is a high level of awareness of PCOS among Saudi women. (Alessa et al., 2017)

2.6 Perception and awareness of patients regarding ovarian cysts in Peshawar, Pakistan: a qualitative approach

The objective of this study was to evaluate the patient's perception regarding ovarian cyst and the awareness of the patients about the symptoms and health management in ovarian cyst. A interview was conducted on patients. All the interviews were conducted in the Gynecology ward of Hayatabad Medical Complex (HMC), Peshawar, Pakistan. Results were thematically analyzed. Thematic content analysis yielded 5 major themes: 1) Irregular menstrual cycle, 2) nausea and vomiting, 3) difficulty in emptying urinary bladder completely, 4) emergency due to severe pain, and 5) Physical work. This study was done mainly to create awareness about PCOS among patients. (Almas et al., 2016)

2.7 Prevalence and Knowledge of Polycystic Ovary Syndrome (PCOS) Among Female Science Students of Different Public Universities of Quetta, Pakistan

The aim of the study was to determine and interpret the prevalence of symptoms of PCOS in female students and to check the percentage of female students who are aware of these diseases. The study was conducted in different university of Quetta. The finding of study revealed that 374 (72.5%) respondents were not aware of PCOS andge knowledge thorough brochure. 407(90.2%) subjects were having adequate knowledge about PCOS after educational intervention. According to the finding of study prevalence of signs and symptoms of PCOS are increasing but females are not aware of PCOS although its sign and symptom was present many of them. (Haq et al., 2017)

2.8 Awareness of PCOS in adolescents and young girls

The study was conducted to assess knowledge on PCOS among medical students. Survey of 200 girls was done to assess the knowledge on the polycystic ovarian syndrome among the medical students of different colleges studying in 1st, 2nd, and 3rd year. The data was collected from the students by using structured questionnaire.51% girls had normal BMI, 19.5% were overweight, 16.5% were obese while 13% were underweight. 33.5% females had acne, 16% had irregularity of menses, 5% had hirsutism while 2% had infertility. In present

study, 33% adolescent and young girls had information about PCOS from teacher, 19% got information from friend, 11.5% got information from a doctor, 3.5% got information from newspaper while 5% got information from internet. 28% adolescent and young girls were unaware of PCOS. (Jayshree and Chaitanya, 2017)

2.9 An exploratory survey to identify the adolescents with high risk for Polycystic Ovarian Syndrome (PCOS) and to find the effectiveness of an awareness programme among students of selected pre university colleges of Udupi District

The aim of the study was to identify the adolescents with risk for developing PCOS and to find the effectiveness of awareness program. The study was conducted in selected pre-university colleges of Udupi District and 752 students were selected from six colleges. A total of 102 (13.6%) students were found to have moderate risk for developing PCOS. A significant increase in the knowledge scores on PCOS was observed after the awareness program ($p < 0.001$). This study demonstrated that an awareness program could bring about a desirable change in knowledge among adolescent girls regarding PCOS and prevent future complications. (Shobha et al., 2014)

Aims and objectives of the study

The main aims and objective of this study

- To create awareness of the polycystic ovary syndrome among future doctor.
- To help future doctor recognize the early sign and symptom of PCOS.
- To encourage the participants to seek prompt medical attention for symptoms of PCOS which include obesity, hirsutism, type 2 diabetes, irregular menstruation, oligomenorrhoea etc.
- To create awareness about the risk factors of PCOS and prevention by modifying lifestyle or avoiding the risk factors.
- To inform future doctor about the importance of PCOS.
- To evaluate their perception towards PCOS patient.
- To analyze the correlation among demographic characteristics with knowledge and attitude of future doctor towards PCOS.

Significance of the study

Polycystic ovary syndrome (PCOS) is a prevalent, chronic and heterogeneous endocrine condition with reproductive, metabolic and psychological features. It is present 12% of women of reproductive age. PCOS affects about 10 million women in the world. Further more the rate is higher in developing countries like Bangladesh.

Although PCOS is known to be associated with reproductive morbidity and increased risk for endometrial cancer, diagnosis is especially important because PCOS is now thought to increase metabolic and cardiovascular risks. These risks are strongly linked to insulin resistance and are compounded by the common occurrence of obesity, although insulin resistance and its associated risks are also present in nonobese women with PCOS.

It requires more attention on knowledge and awareness of the community of the people regarding many areas, especially about diagnostic and treatment service opportunities, availability of services, effect as well as impact of diseases. Irregularity of the treatment can be serious threat for the population of the country.

A significant portion of low to higher educated people has poor knowledge about PCOS. On the other hand, there are little number of surveys on level and awareness of PCOS. Awareness for PCOS can lead to reduction in infertility, diabetes, obesity, myocardial infraction and others major complications.

This study has paid special attention to medical students considering their potential influence on the patients and their contribution to nation's work force near future in a particular nation.

PCOS is a common, life long condition that appears to be increasing in prevalence with increasing obesity, yet largely undiagnosed, limiting opportunities for prevention and management. Future doctor should be aware of PCOS and seek to increase early diagnosis as well as be aware of the significant metabolic features of this condition.

This study will be helpful to increase PCOS awareness rate, to estimate the PCOS awareness level among the medical students and to examine the association between socio demographic characteristics and PCOS awareness.

Thus I have conducted a survey on knowledge and awareness of polycystic ovary syndrome among medical students of both public and private colleges in Dhaka.

Chapter-3

Methodology

3.1 Type of study

The study was survey based study.

3.2 Study area

The study was conducted in private and public medical colleges in Dhaka, Bangladesh.

3.3 Study population

The study was performed on 400 female medical students among aged 18 to 28, from August 2017 to October, 2017.

3.4 Inclusion criteria

In this survey only female medical students were included.

3.5 Exclusion criteria

In this survey,

- Males were excluded
- Non-medical students were excluded

Anyone unwilling to participate or unable to comply with protocol requirements were excluded

3.6 Study tool

To facilitate the study of knowledge and awareness of Polycystic Ovary syndrome among female medical students in Dhaka, Bangladesh , a questionnaire was established in March 2017. Through this questionnaire, demographic information were collected along with some factors that may be associated to the knowledge and awareness of Polycystic Ovary syndrome among female medical students aged 18 to 28.

3.7 Questionnaire Development

The questionnaire was developed based on some common criteria that influence knowledge and awareness of Polycystic Ovary Syndrome among female medical students in Dhaka, Bangladesh. The questionnaire was developed on the perspective of Bangladesh .So that maximum accurate statistical data can be collected from the survey.

3.8 Data Analysis

After data collection ,these data were set on the Microsoft office excel and filtered out according to the age range, site of living area, educational qualification, knowledge about PCOS ,marital status ,family history, risk factor, etc. so some graphical representations were found that was visually representative of the targeted subject.

3.9 Ethics

This study was done without conflicting the ethical issues, ethical considerations was checked by the research supervisor with the research policy of the East West university, oral consent was taken prior to study from the participants.

Chapter-4

Result

4.1 Age distribution

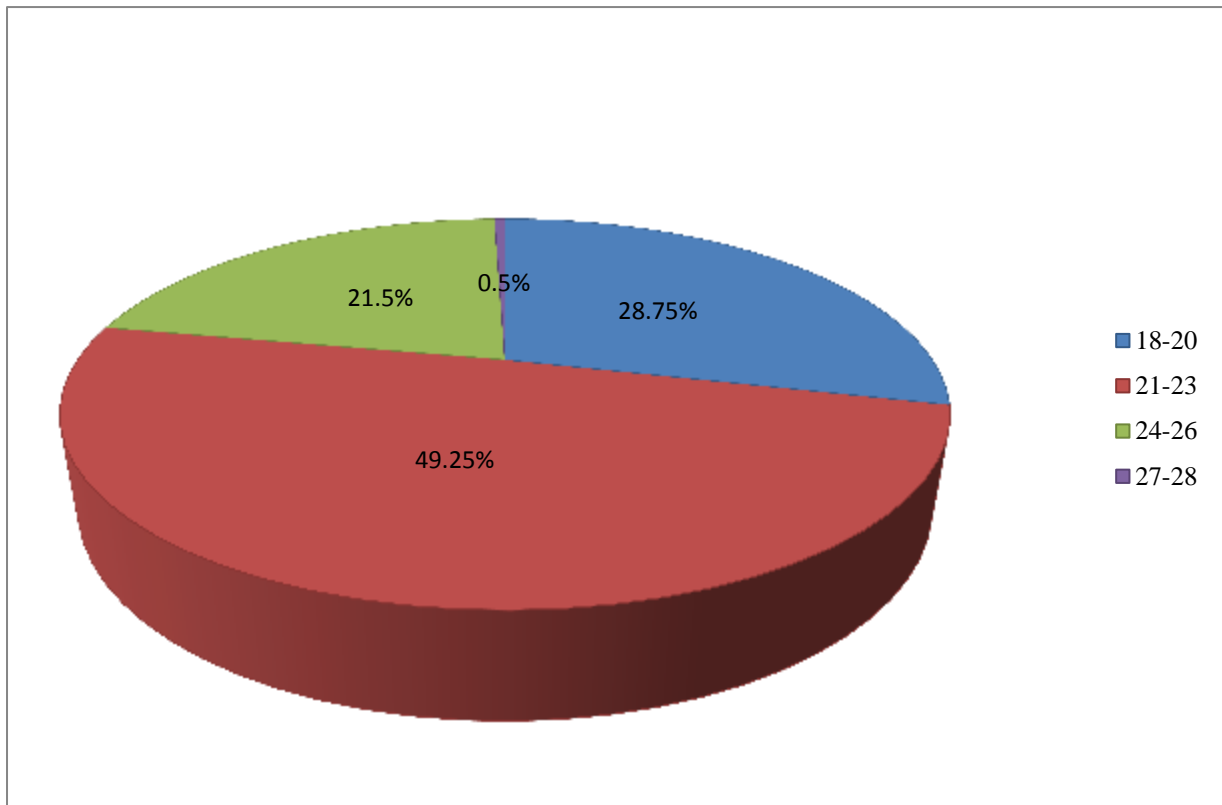


Fig: 4.1 Distribution of Age

In this survey about maximum (49.25%) students were in age range 21-23 years, minimum (0.5%) students were in age range 27-28 years and remaining (28.75%) were 18-20 and 21.5% students were in age range 24-26 years.

4.2 Distribution of religion

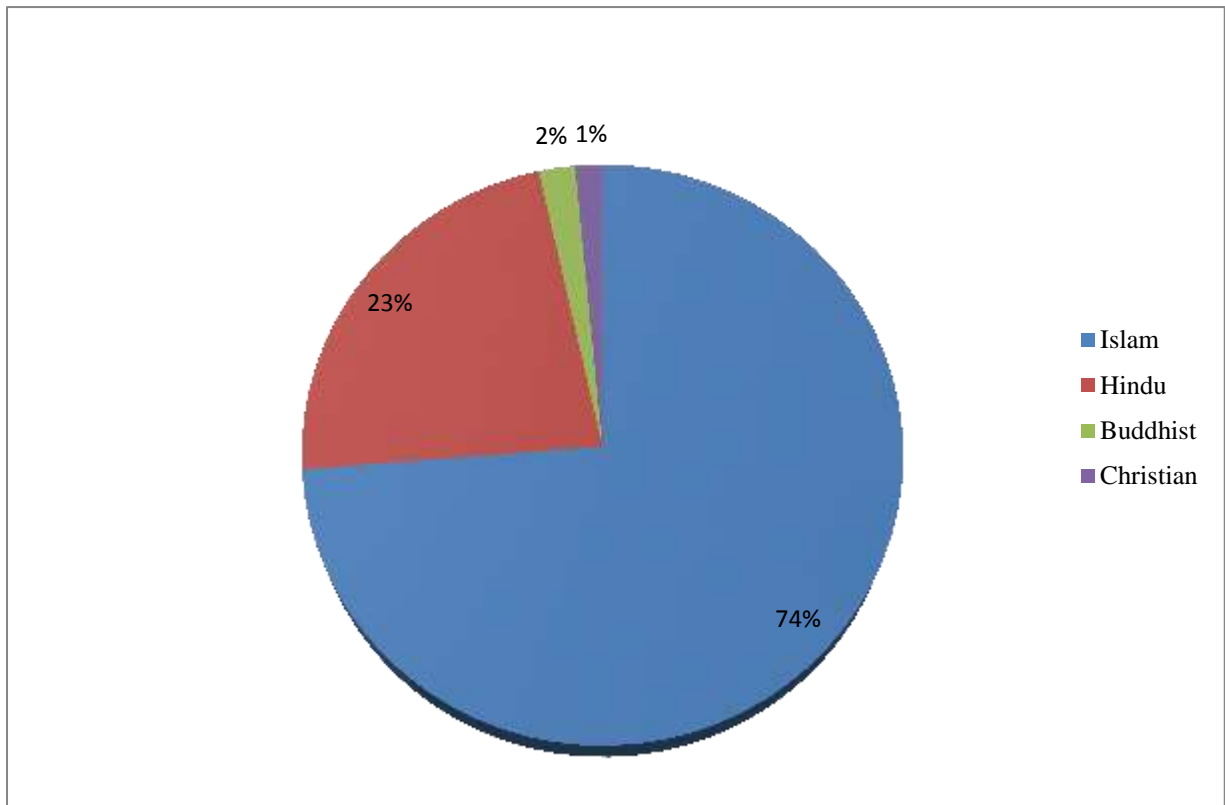


Fig 4.2 Distribution of religion

In this survey, maximum 74% students were muslims, 23% students were Hindus and remaining 2% students were Buddhist and minimum 1% were Christian.

4.3 Distribution of institution

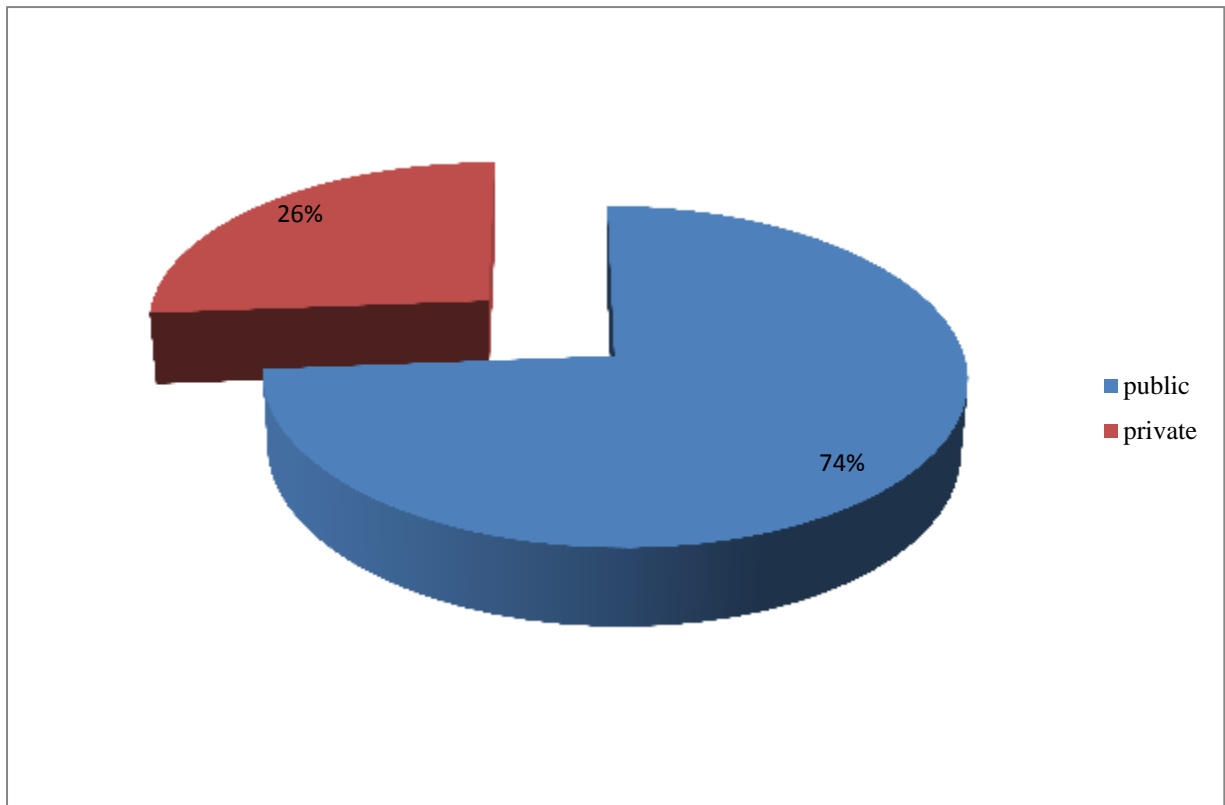


Fig 4.3 Distribution of institution

In this study, maximum 74% students studied in public medical colleges and minimum 26% Students went private medical colleges.

4.4 Marital status of respondents

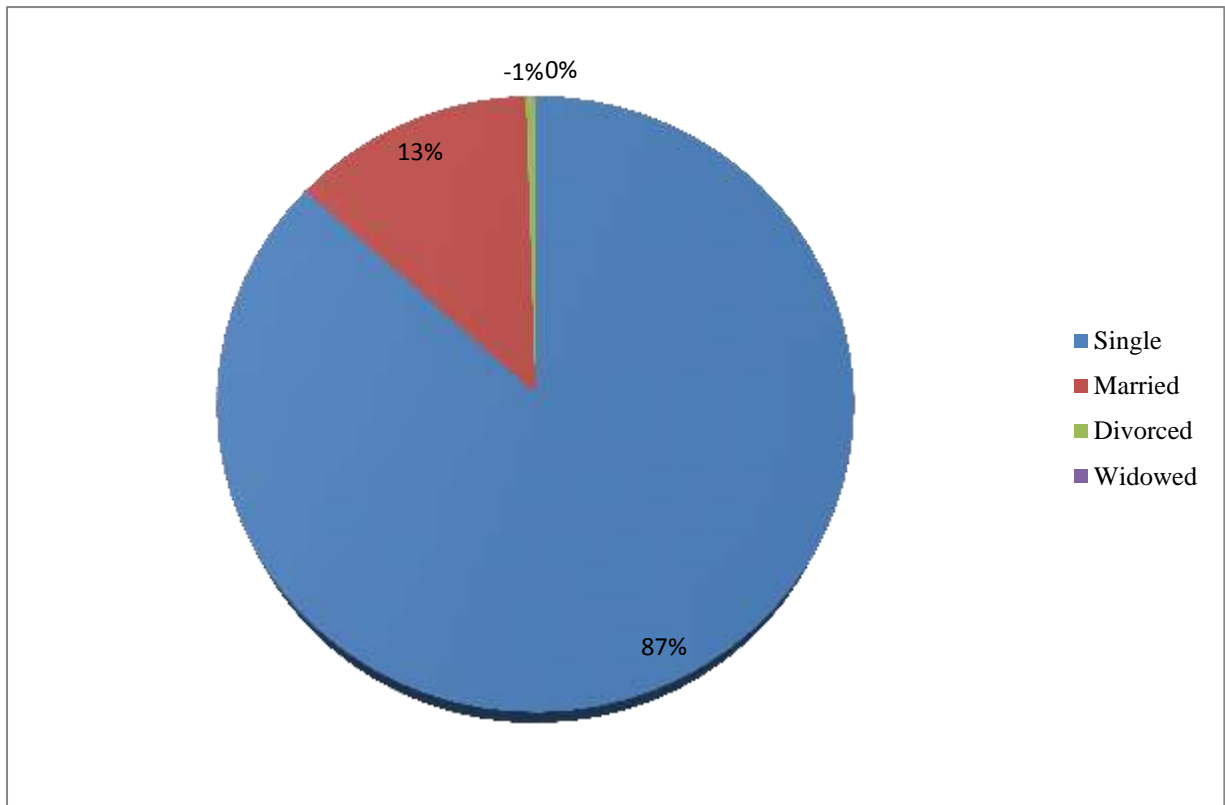


Fig 4.4 Marital status of respondents

Among the total students maximum population (about 87%) were single , 13% students were married and only few, 1% students were divorced.

4.5 Awareness about PCOS

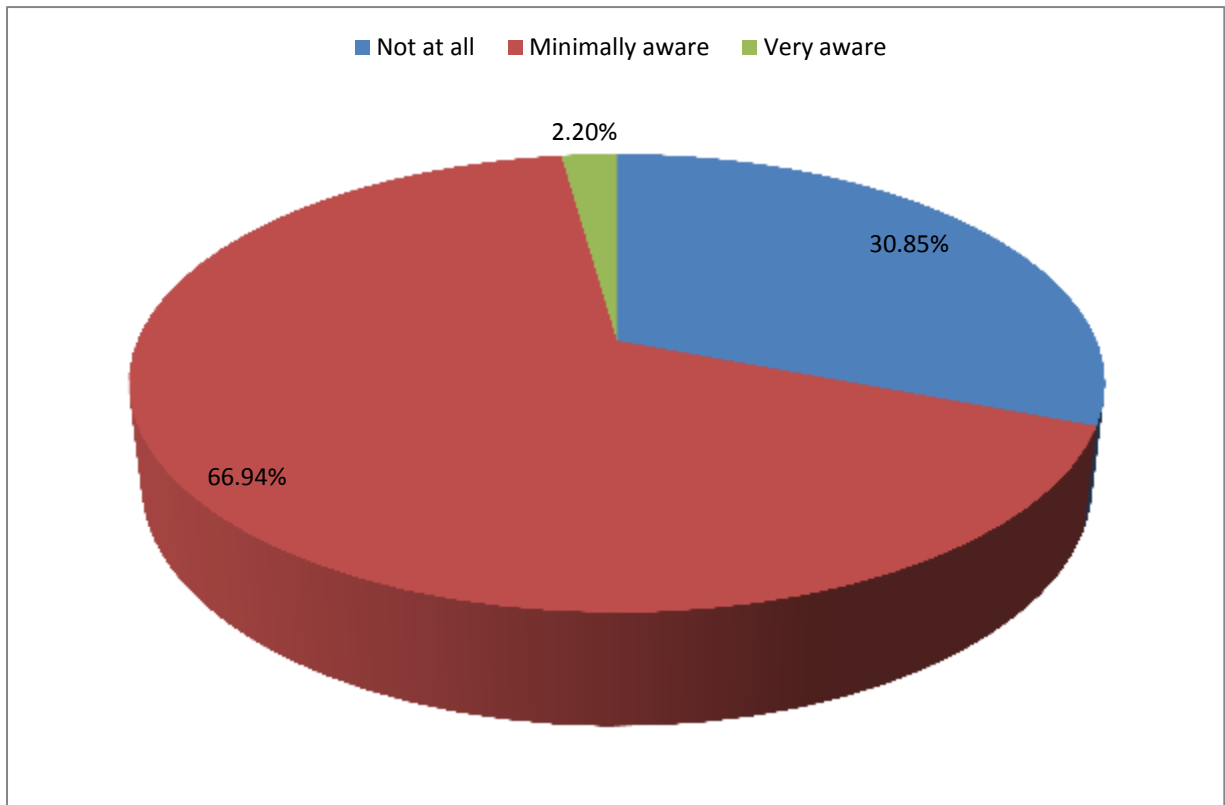


Fig 4.5 Awareness about PCOS

A majority of the population (66.94%) minimally aware about PCOS ,30.85% students were not aware about PCOS and 2.20% were very about PCOS.

4.6 Perception of PCOS

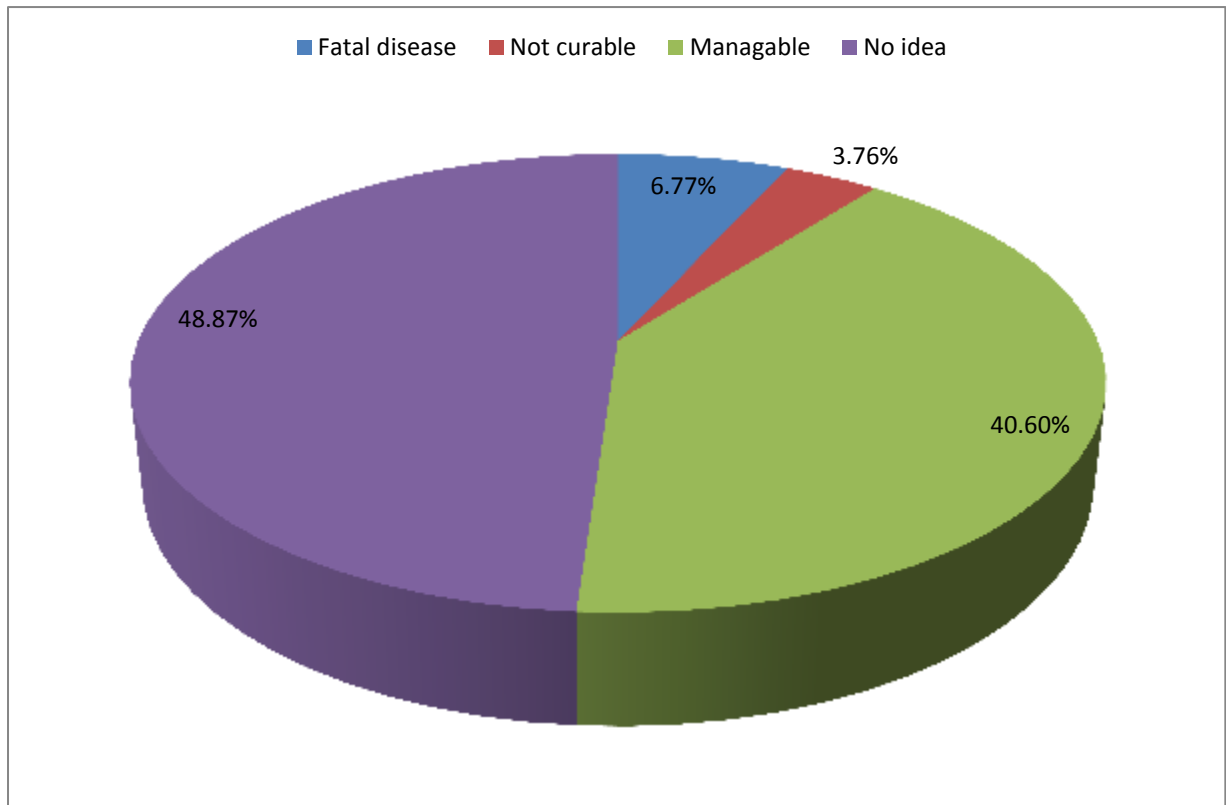


Fig 4.6 Knowledge about Perception of PCOS

A majority of the population (48.87%) had no idea about PCOS, 40.06% population said that it's a manageable disease, 3.76% said that it is not curable disease and remaining of the population said that it is a fatal disease.

4.7 Knowledge of symptoms of PCOS among study population

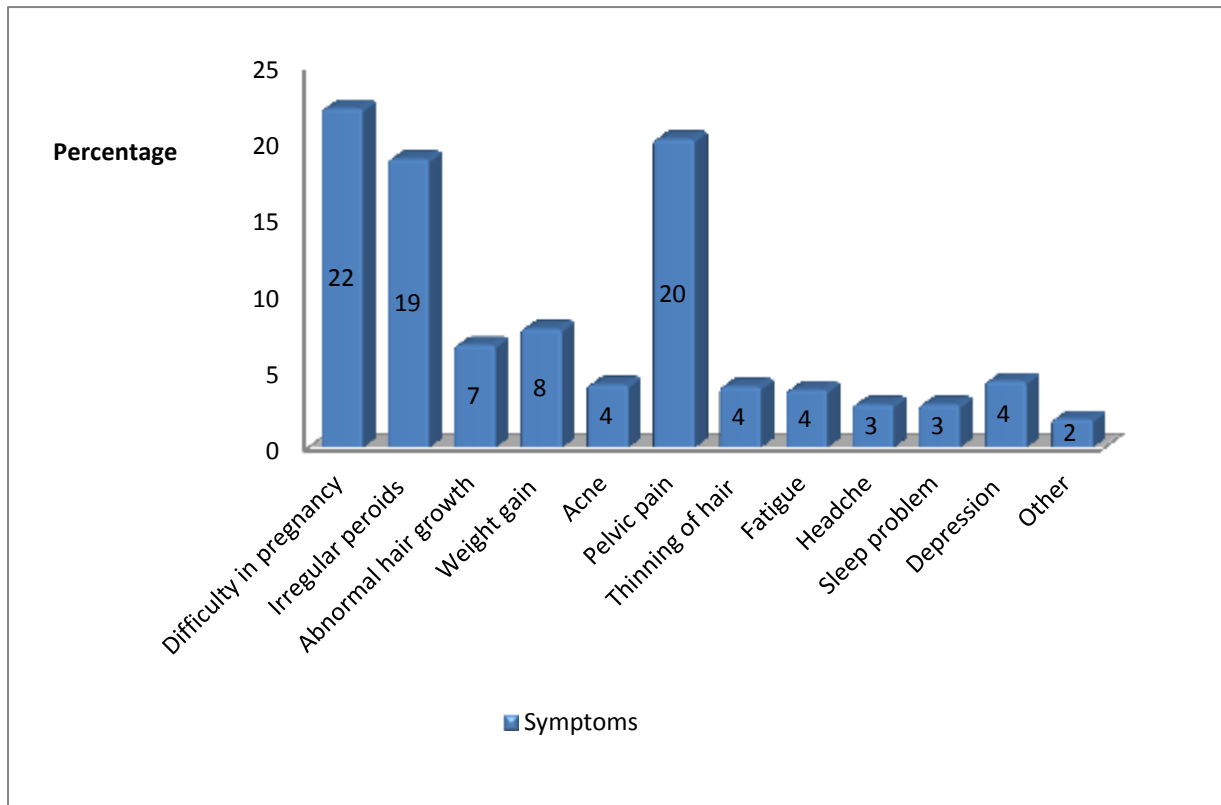


Fig 4.7 knowledge of symptoms of PCOS among study population

In this study, maximum 22% population identified difficulty of pregnancy as symptoms of PCOS, 20% identified pelvic pain, 19% identified irregular peroids, 8% population identified weight gain, 7% population identified abnormal hair growth, and minimum 4% of population identified depression as symptoms of PCOS among study of population.

4.8 Knowledge of complication about PCOS among study population

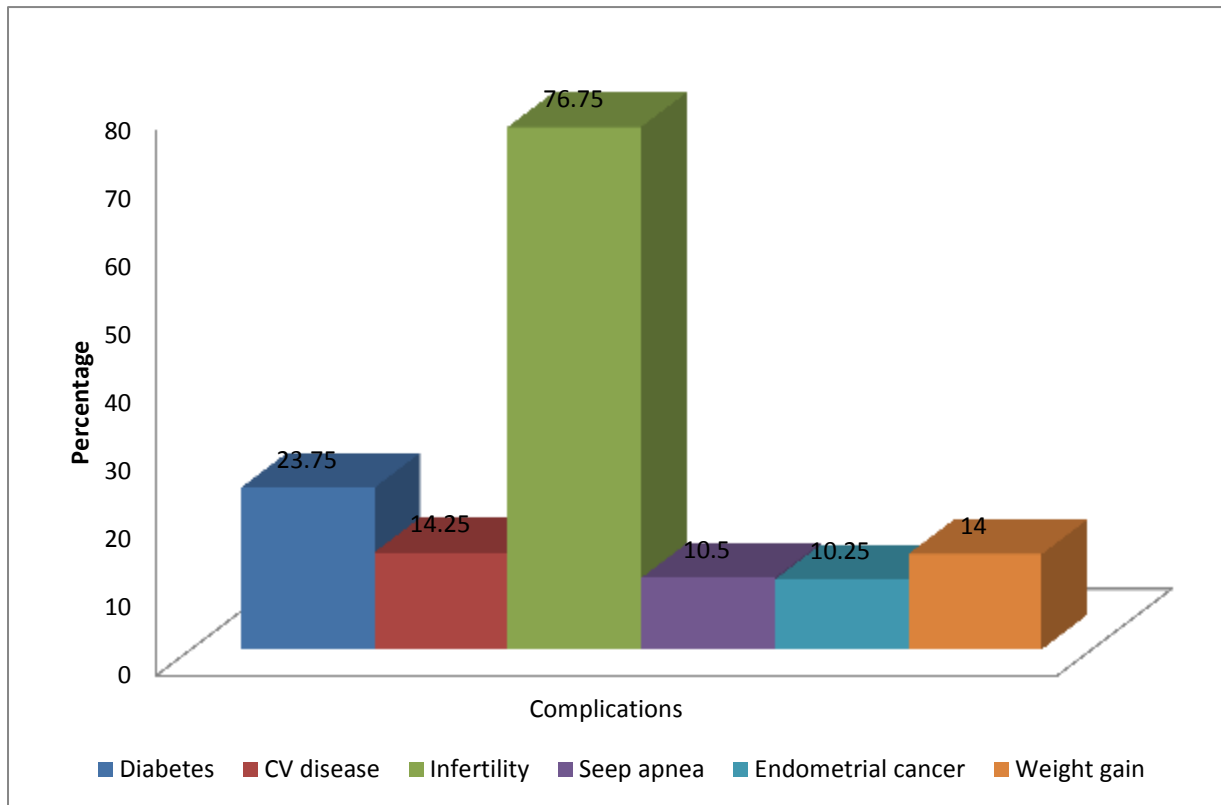


Fig 4.8 knowledge of complication about PCOS among study population

Of the respondents, 76.75% perceived that infertility is a major complication, 10.25% population thought that endometrial cancer can arise from PCOS, 23.75% population thought that diabetes can be a complication of PCOS and remaining 14.25% population perceived that cardiac disease can be a complications of PCOS.

4.9 Prevalence of PCOS among study population

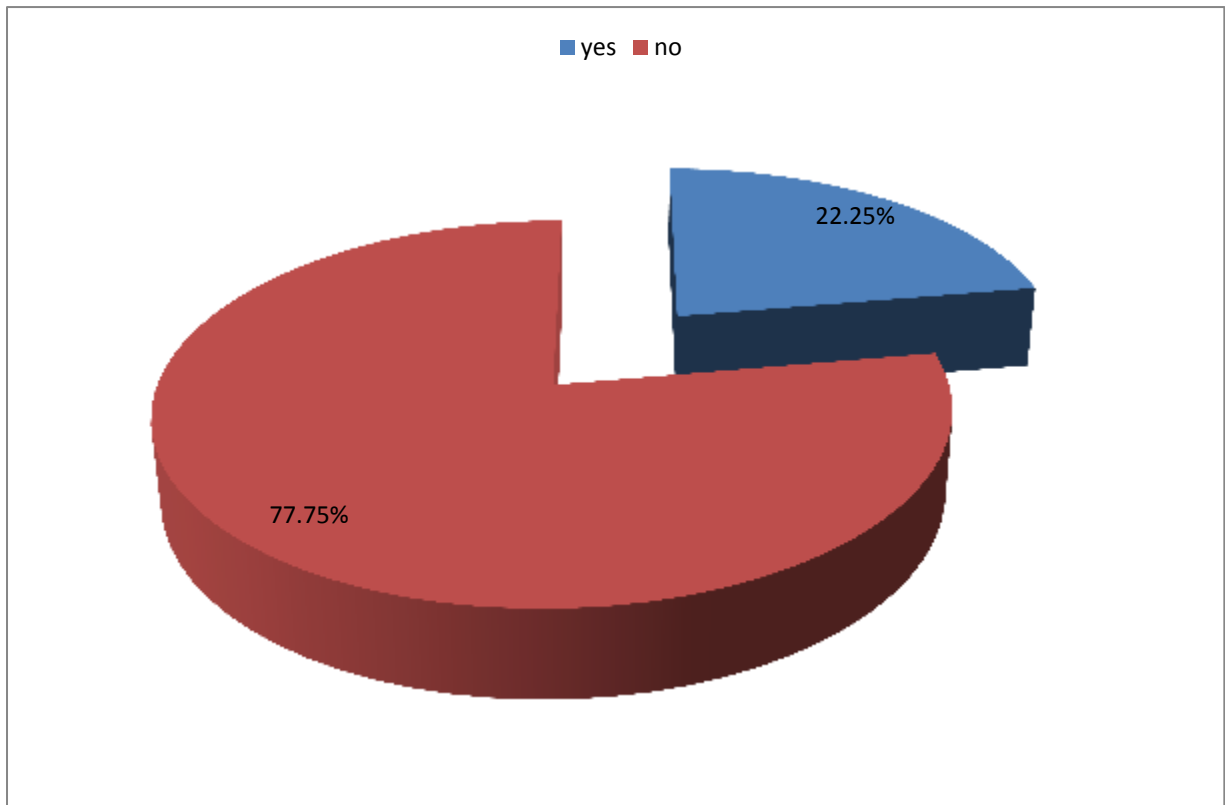


Fig 4.9 Prevalence of PCOS among study population

In the study, 22.25% population was identified with PCOS and 77.75% population was free from PCOS.

4.10 Family history of PCOS patients

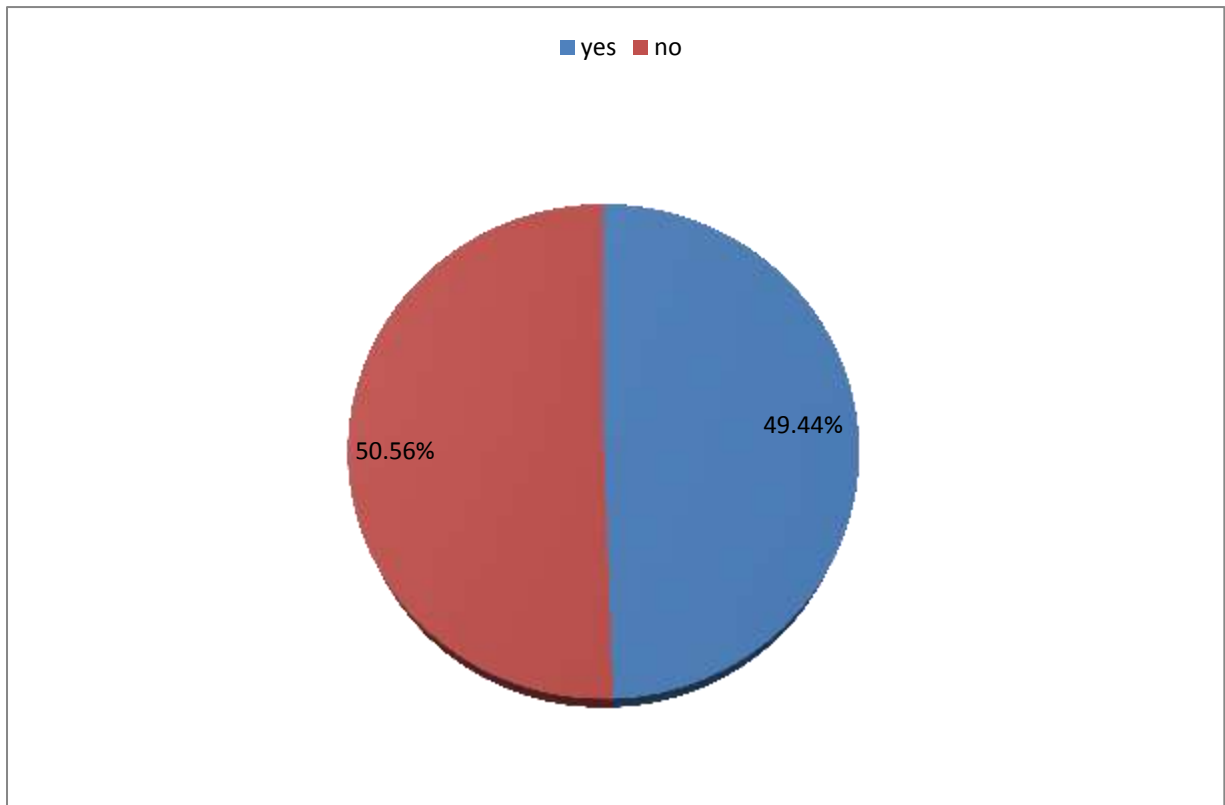


Fig 4.10 Family History of PCOS patients

Among the PCOS affected population, 50.56% had family history of PCOS and 49.44% population had no family history of PCOS.

4.11 Diagnosis method of PCOS among PCOS patients

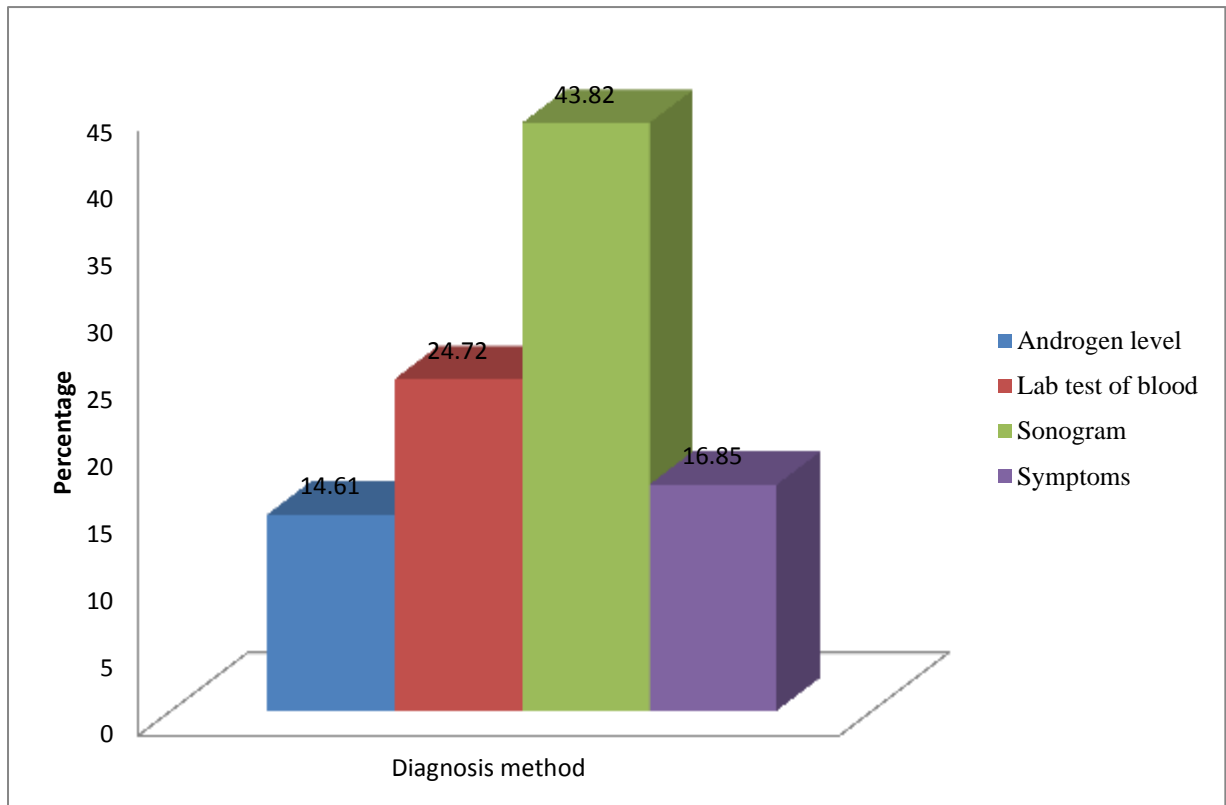


Fig 4.11 Diagnosis method of PCOS among PCOS patients

In the study, maximum 43.82% patients were diagnosed by sonogram, minimum 14.61% patients were identified by androgen level, 24.72% were diagnosed by lab test of blood and remaining 16.45% were identified by symptoms.

4.12 Feelings experienced by PCOS patients

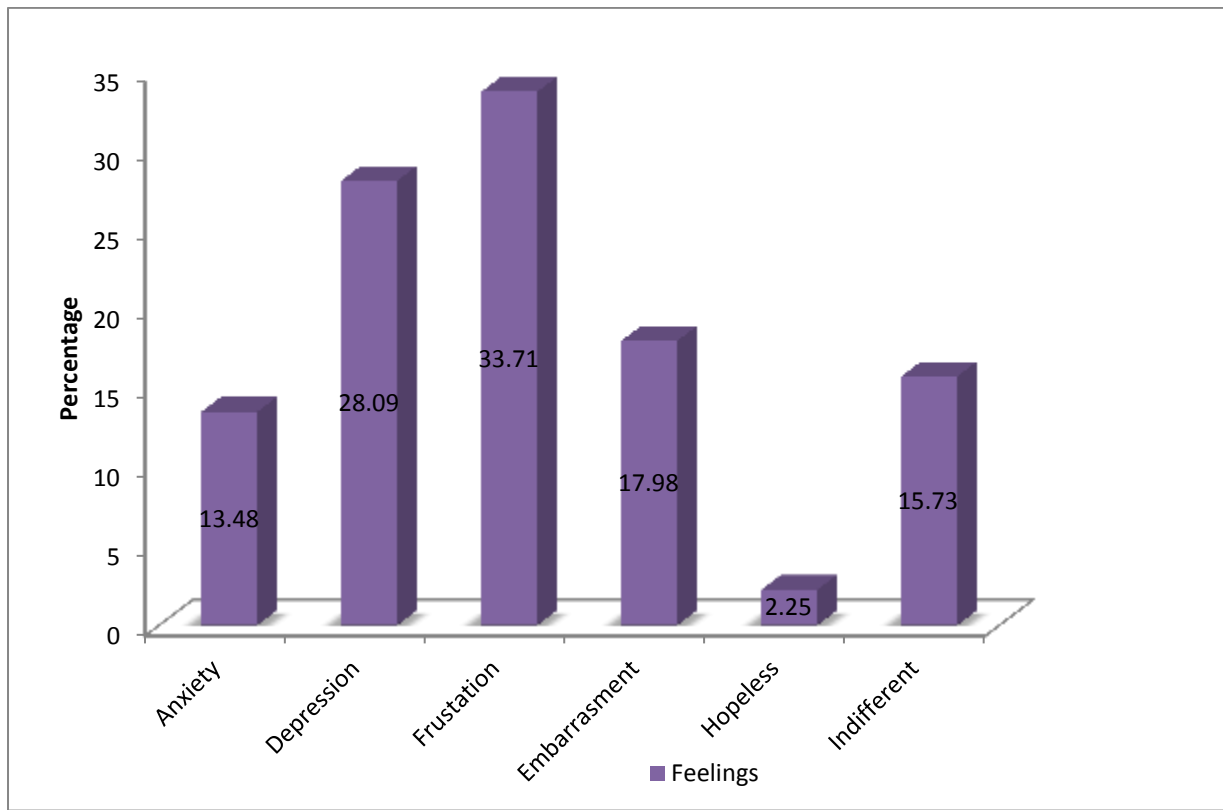


Fig 4.12 Feelings experienced by PCOS patients

From the study, maximum 33.71% were identified with frustration, 28.09% were identified with depression, 13.48% were identified with anxiety, 17.98% were identified with embarrassment, minimum 2.25% were experienced hopeless.

4.13 Treatment undergone by PCOS patients

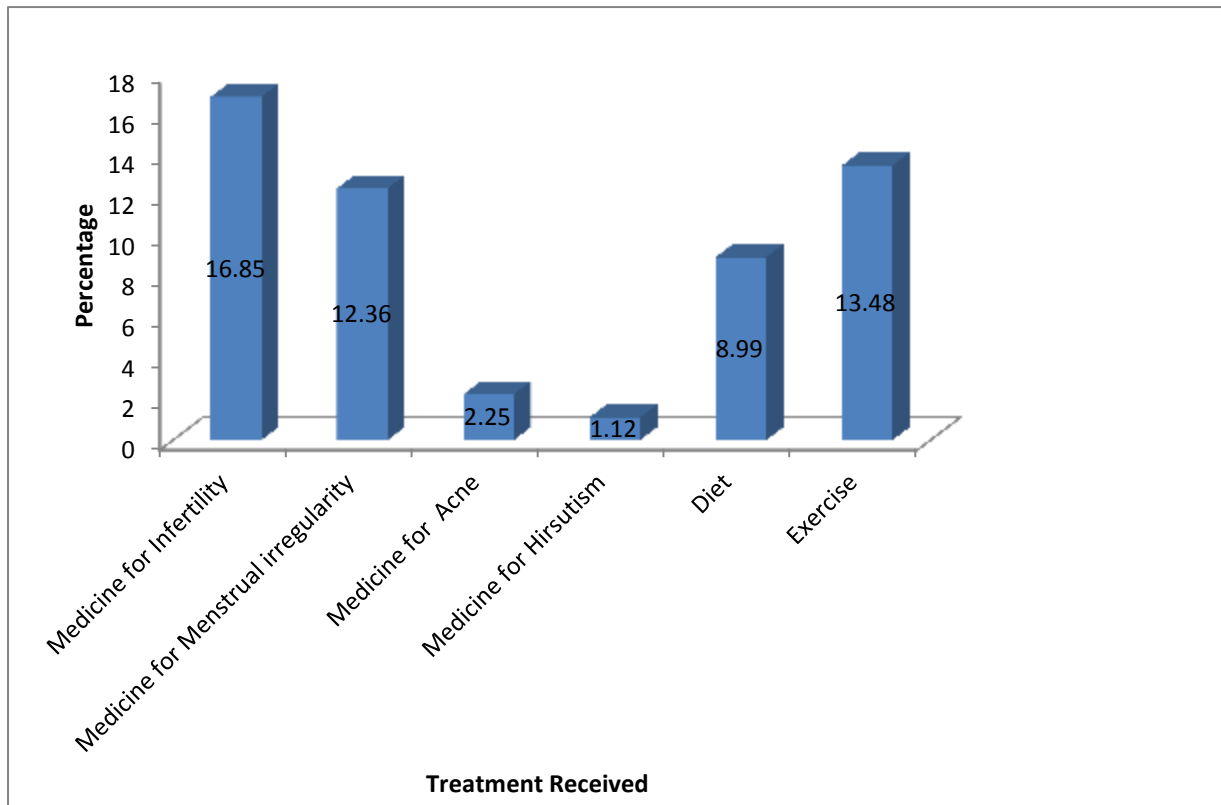


Fig 4.13 Treatment Undergone by patients

From the study, 16.65% patients were treated for infertility, 13.48% patients who were exercising, 12.36 were undergone by menstrual irregularity treatment, minimum 1.2% patients received treatment for hirsutism.

4.14 Source of information

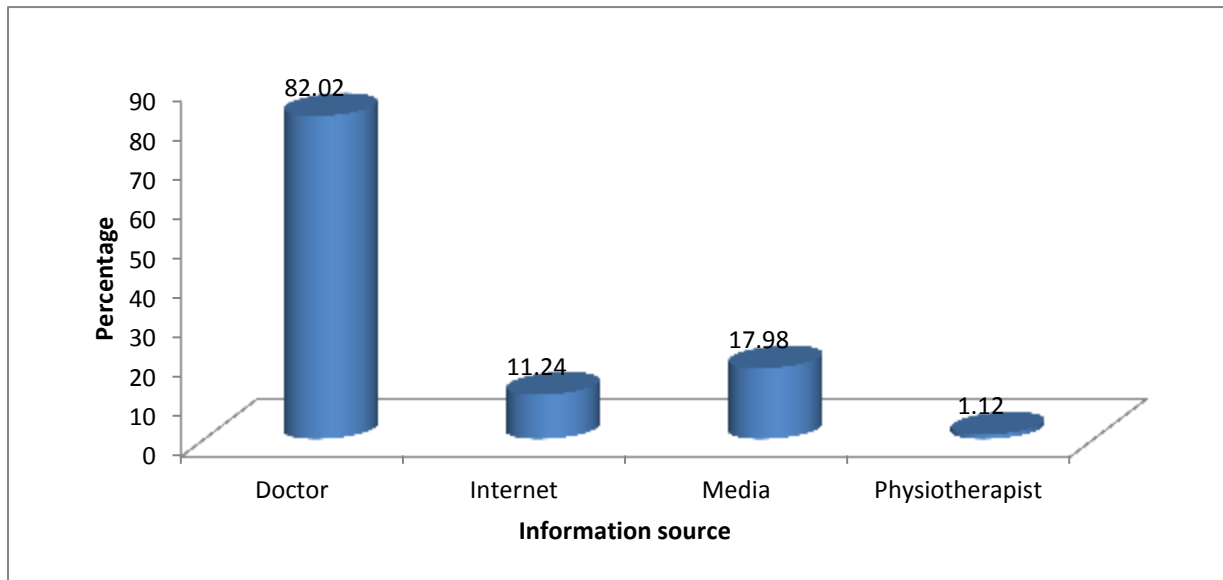


Fig 4.14 Knowledge of source of information

Of this study, maximum 82.02% patients had information of PCOS from doctor, 17.98% patient had information from media, 11.24% patient had information from internet and only a very few 1.12% had information from physiotherapist.

4.15 Prevalence of factors on check up

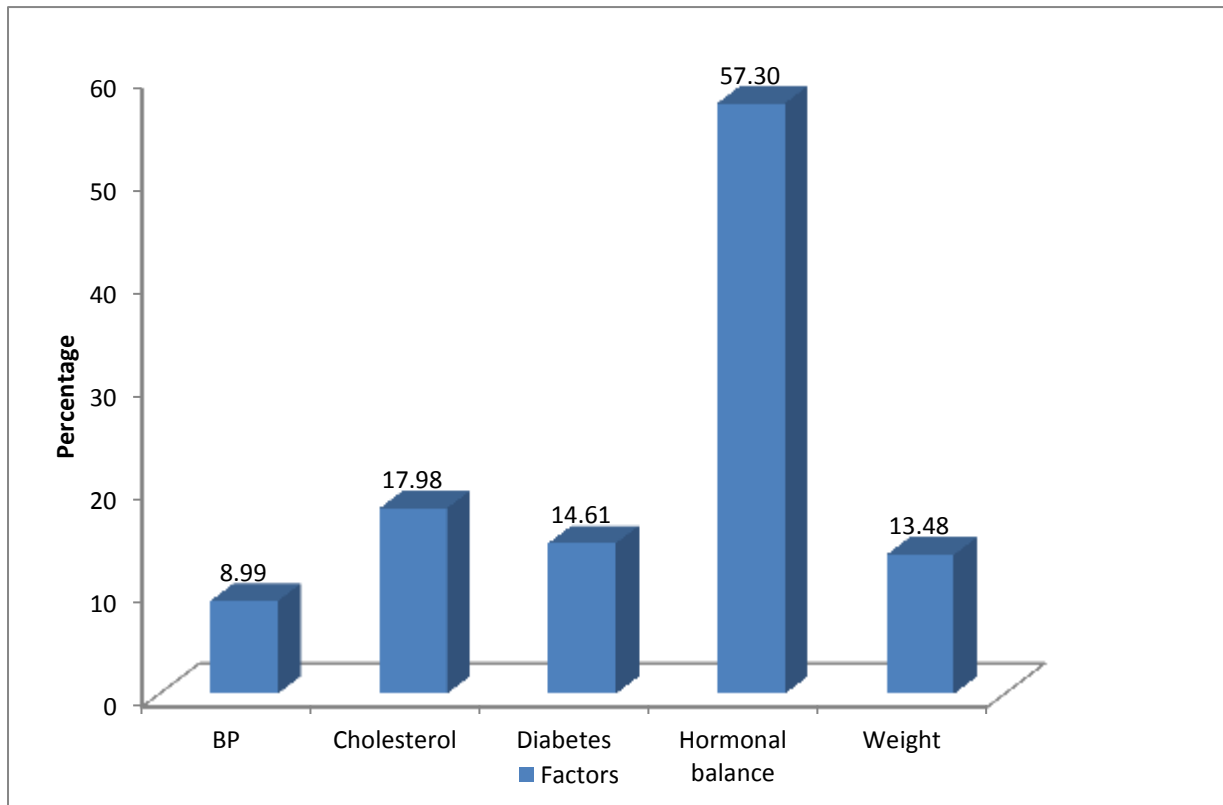


Fig 4.15 Prevalence of factors on check up

In this study, 57.30% patient were checked up their hormonal balance, 17.98% patient checked up their cholesterol level, 13.48% patient checked up their weight and remaining 14.61% were checked up their sugar level.

4.16 Junk food intake by PCOS patients

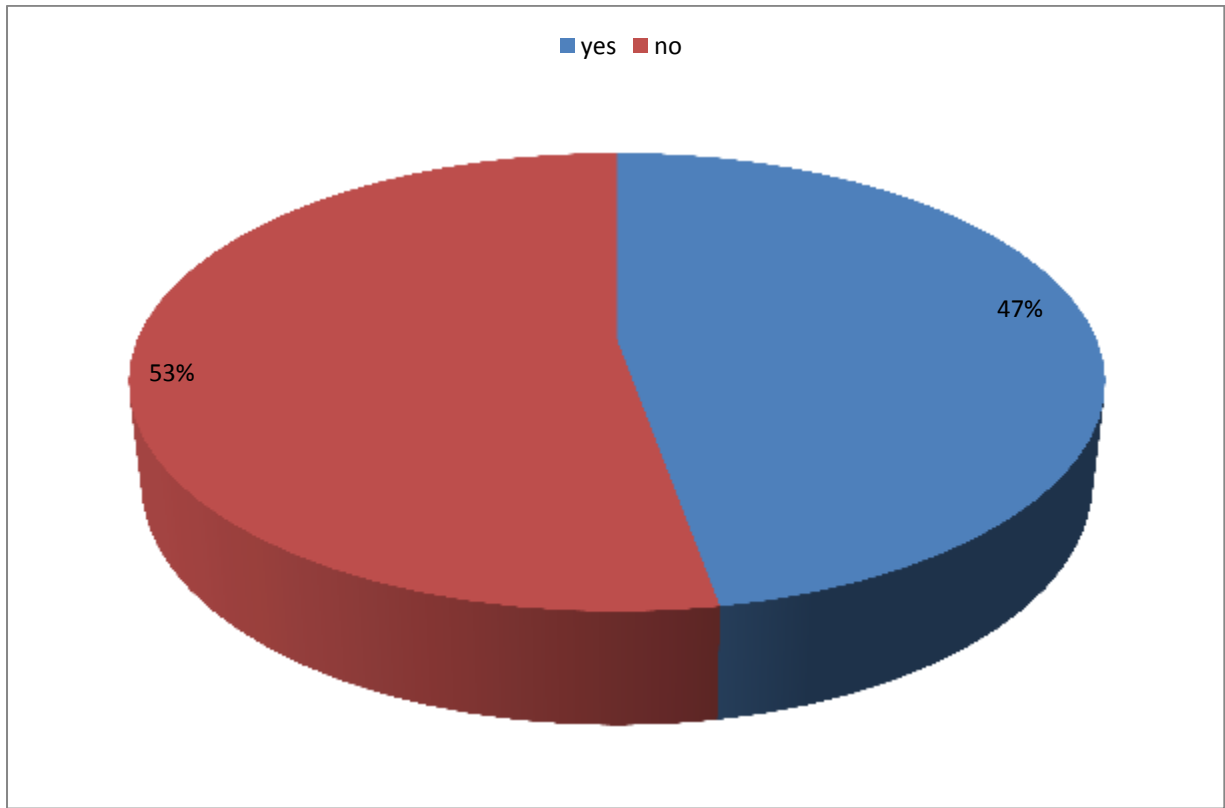


Fig 4.16 Junk food intake by PCOS patients

In this study , 52.80% patients did not eat junk food and rest of the (47.19%) patients ate junk food.

4.17 Intake of water by PCOS patients

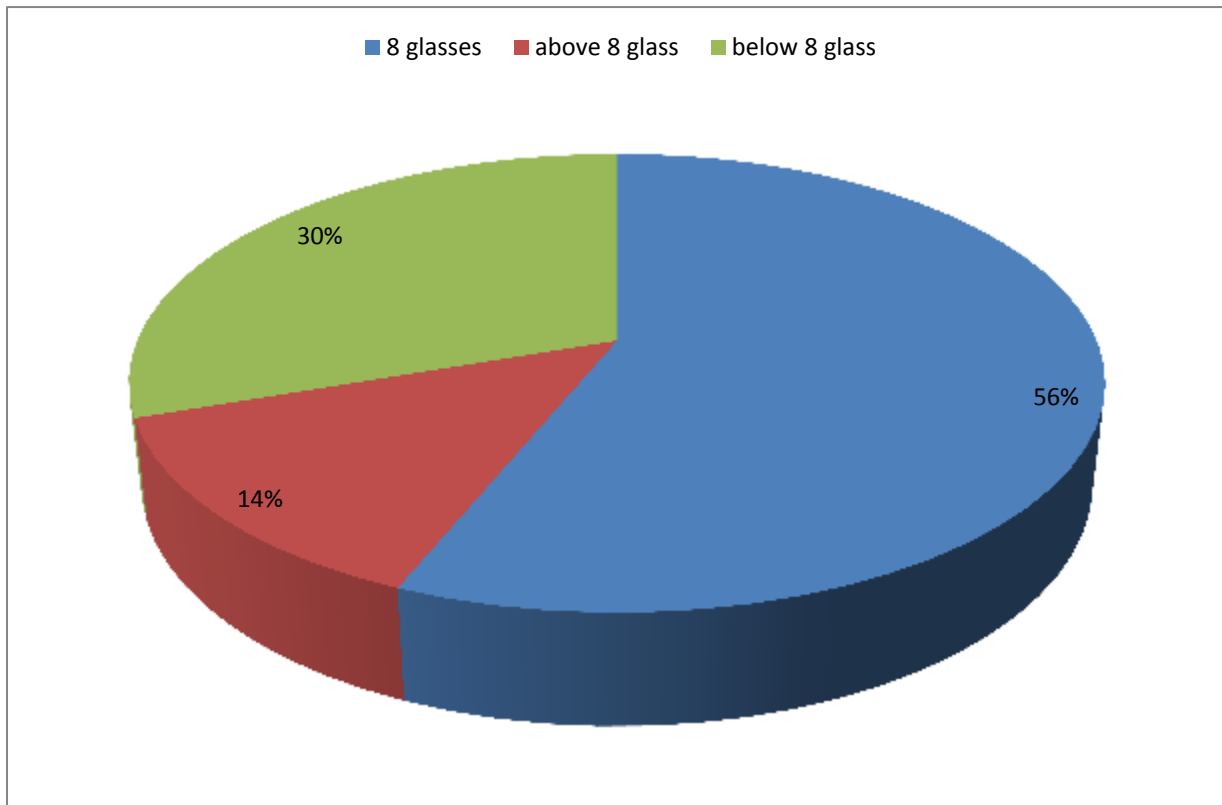


Fig 4.17: Intake of Water by PCOS patients

From this study ,maximum 56.17% drunk 8 glasses of water daily,minimum 13.48% patients drunk above 8 glass of water and remaining 30.33% drunk below 8 glass of water daily.

4.18 Knowledge of foods to avoid among study population

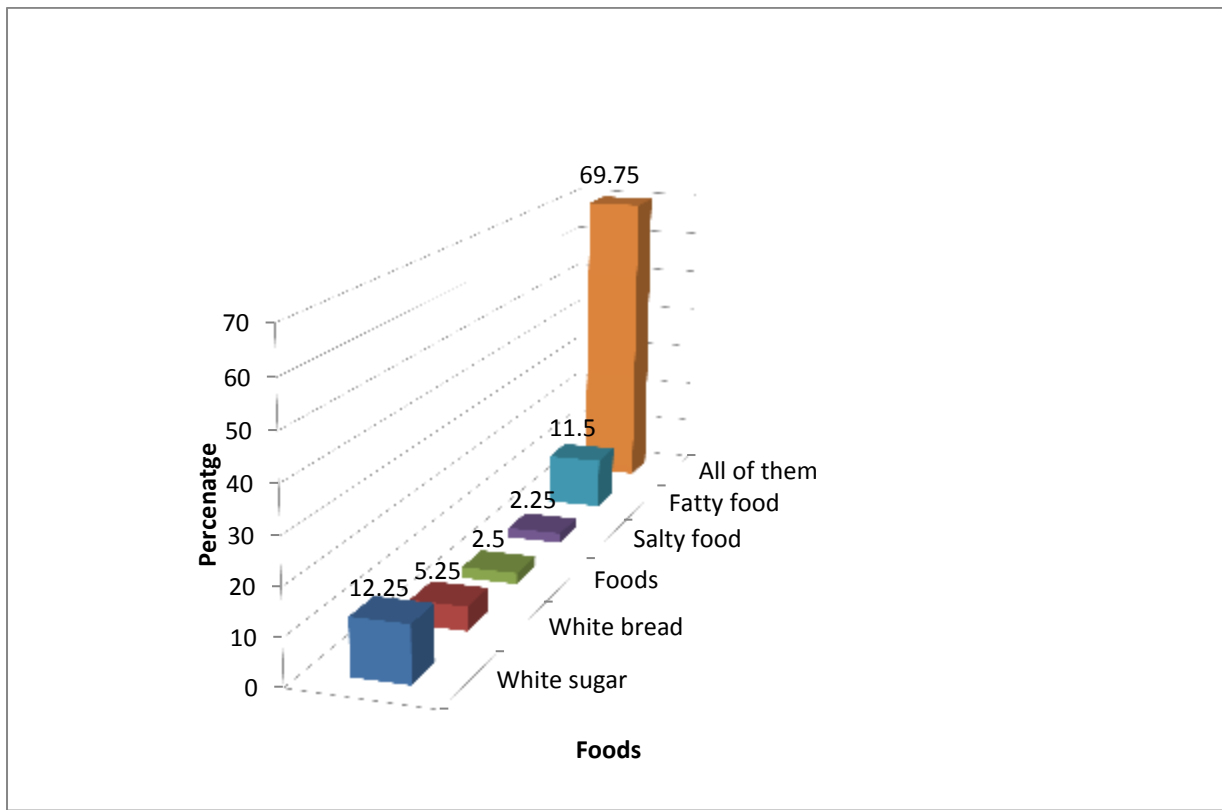


Fig 4.18 Knowledge of foods to avoid among study population

In this study ,maximum 69.75% identified all food to avoid by PCOS patients,11.5% identified fatty food to be avoided by PCOS patients,12.25% identified white sugar to be avoided ,5.25% identified white bread to be avoided ,and minimum 2.25% population identified to be avoided salty food by PCOS patients.

4.19 Knowledge of importance of healthy diet

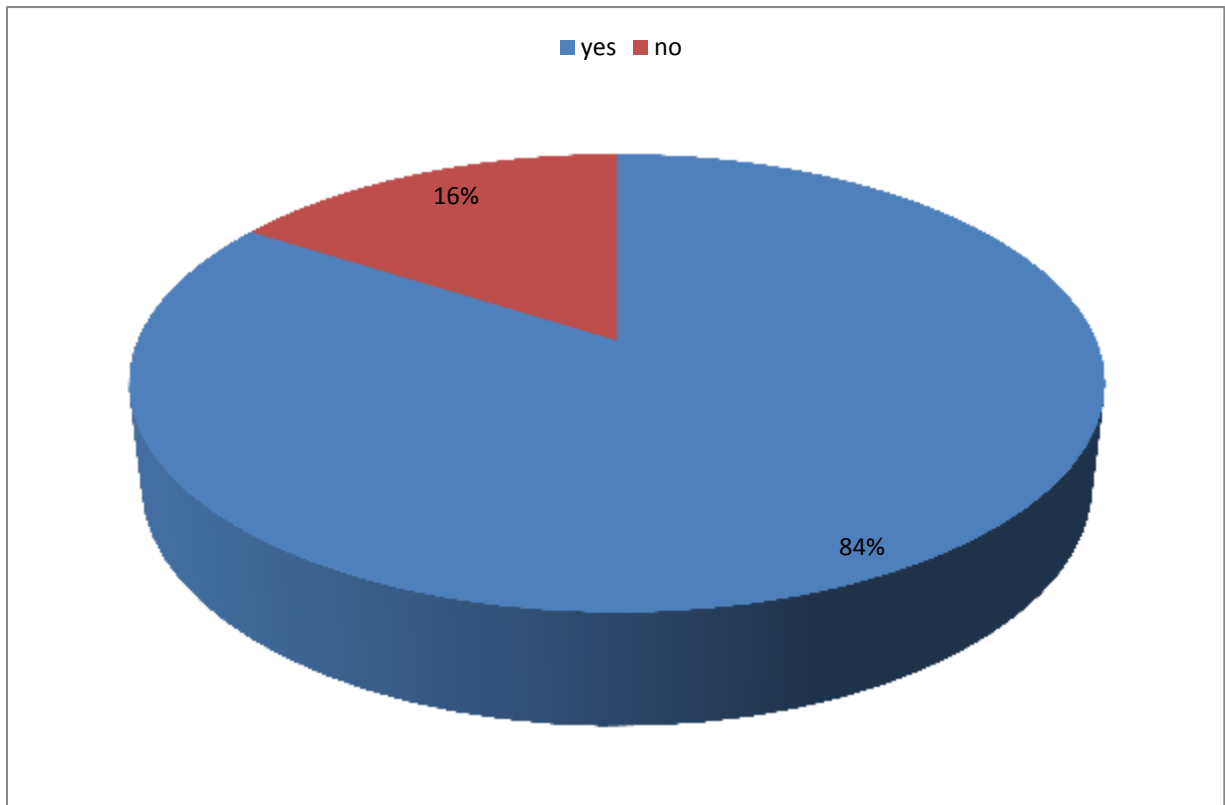


Fig 4.19 Knowledge of importance of healthy diet

In this study ,83.25% population thought that healthy diet can play a role in prevention of PCOS and remaining 15.75% population thought healthy diet cannot play a role in the prevention of PCOS.

4.20 Knowledge of exercise in PCOS prevention

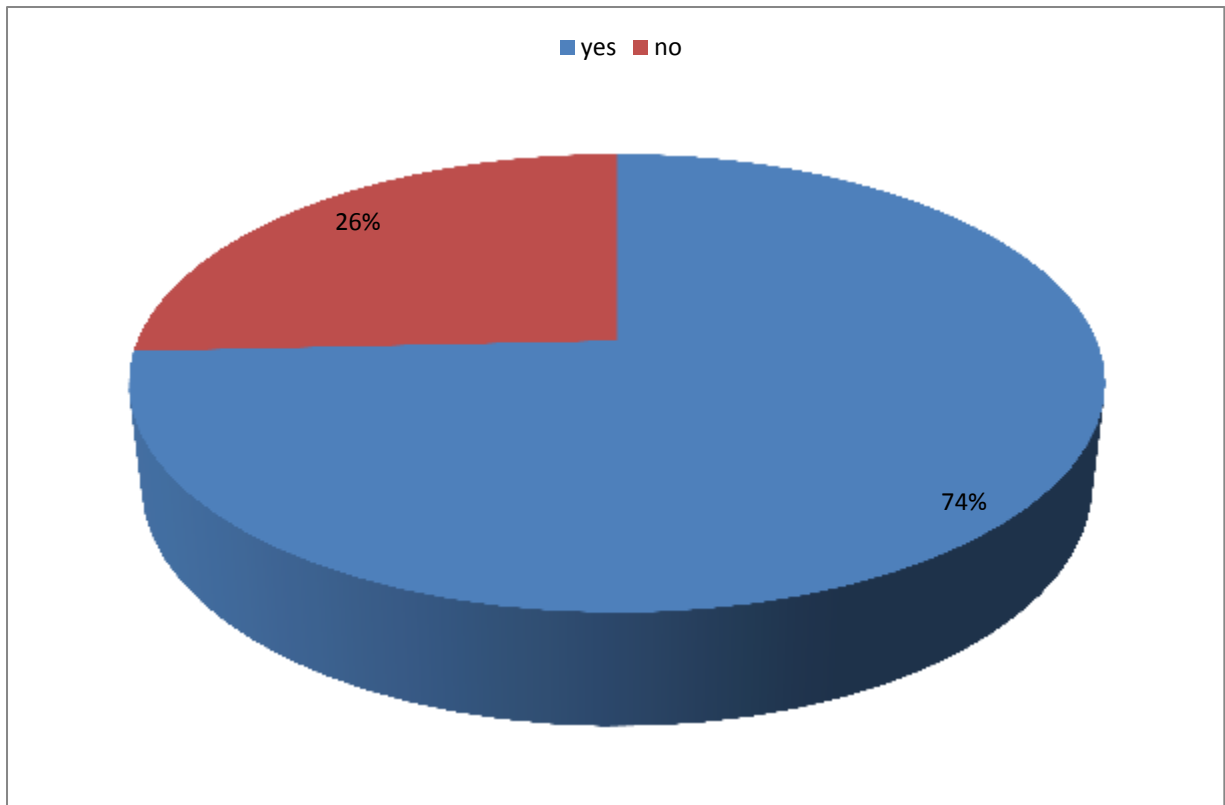


Fig 4.20knowledge of exercise in PCOS prevention

In this study ,74% population thought that exercise can play a role in prevention of PCOS and remaining 26% population thought that exercise cannot help in prevention of PCOS.

4.21 Knowledge of benefits of exercise

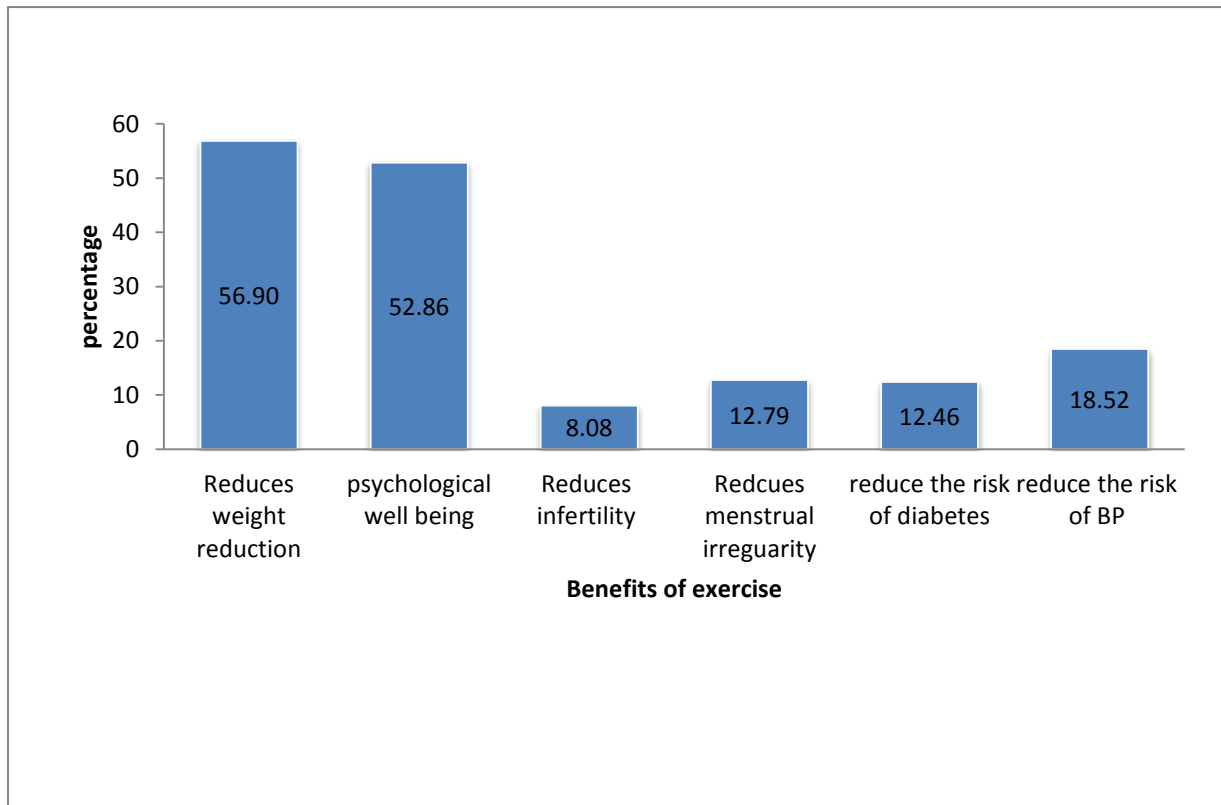


Fig 4.21 Knowledge of benefits of exercise

In this study, maximum 56.90% population identified weight reduction as benefit of exercise, 52.86% who identified psychological well being a health benefit ,18.52% population identified reduce the risk of BP as benefit of exercise,12.79% identified menstrual irregularity as a benefit of exercise and minimum f 8.08% population thought that exercise reduced infertility .

4.22 Refraining factors of exercise

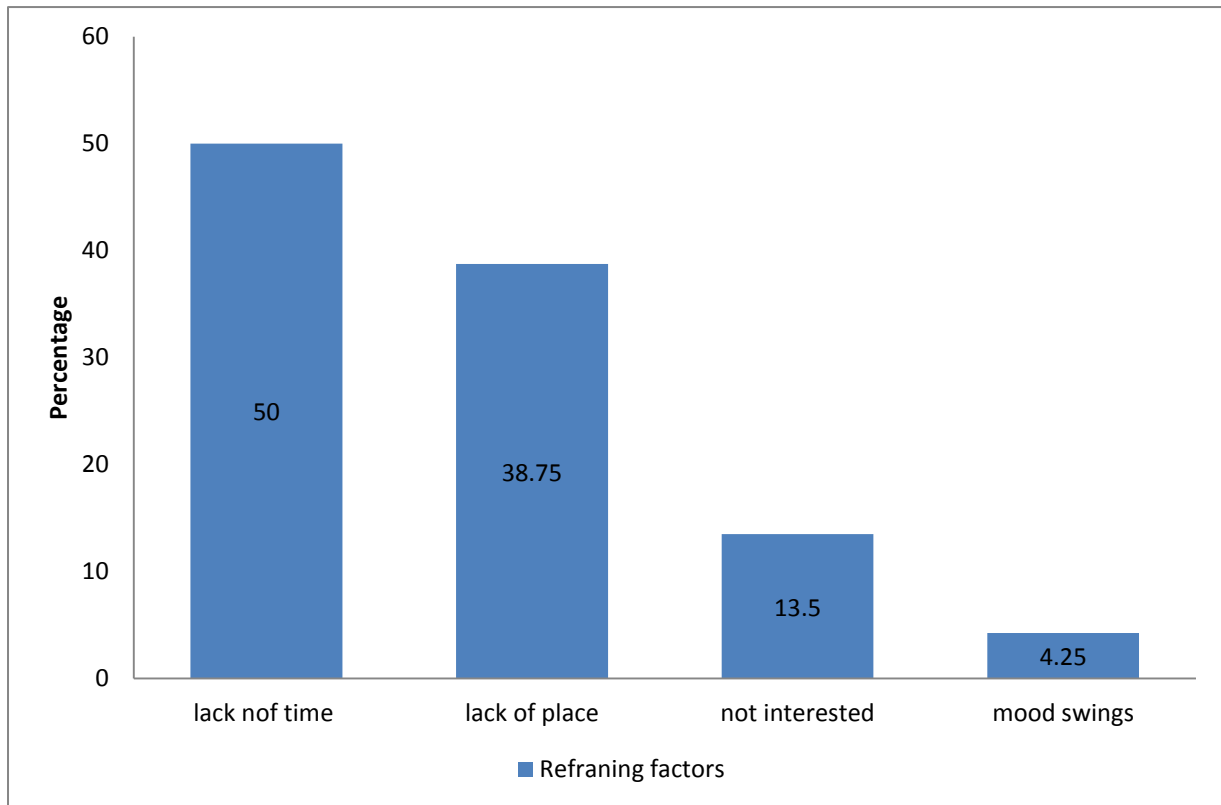


Fig 4.22: Refraining factors of exercise

From this study, 50% population identified lack of time as refraining factor of exercise, 38.75% identified lack of place as refraining factor for exercise, 13.5% population were not interested in exercise and remaining 4.25% identified mood swing as a refraining factor of exercise.

4.23 Knowledge of Treatment option of PCOS

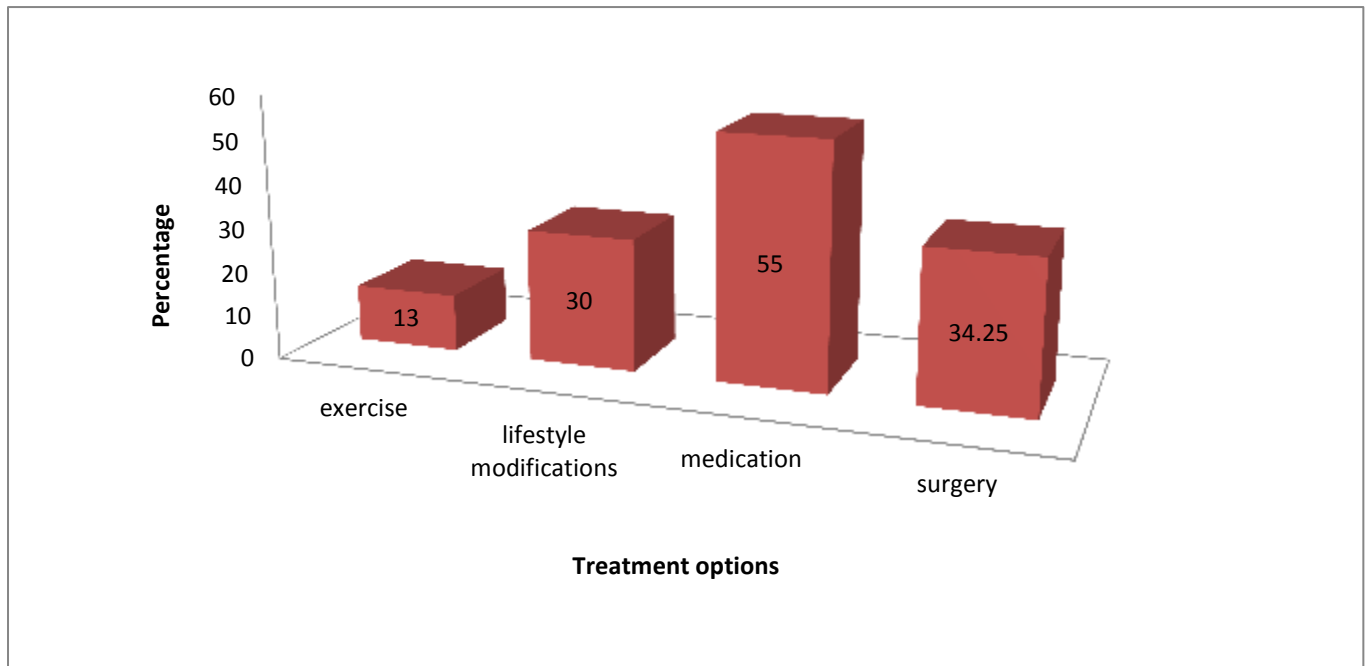


Fig 4.23 Knowledge of treatment option of PCOS

In this study, maximum 55% population identified medication as a treatment option of PCOS, 34.25% identified surgery as a treatment option of PCOS, 30% identified life style modification as treatment option of PCOS and minimum 13% identified exercise as a treatment option for PCOS.

Chapter-5

DISCUSSION AND CONCLUSION

5.1 Discussion

In the present study, we surveyed among 400 female students of both private and public medical colleges in Dhaka (Dhaka medical college, Sir Salimullah medical college, Holy family medical college, Arm forces medical college) about PCOS, particularly on common symptoms, complication, treatment system, lifestyle modification, diet of PCOS patients, diagnosis etc. This study also examined the perception of respondents about PCOS as a common disorder. The study helped us to understand the knowledge and awareness of medical students.

In this study, it was found that majority of the respondents were in age range 21-23 years, minimum (0.5%) students were in age range 27-28 years and remaining (28.75%) were aged between 18-20 and 21.5% students were in age range 24-26 years. About 74% students were muslims, 23% students were Hindus and remaining 2% students were Buddhist and 1% was Christian. In this study, 74% students were studied in public medical colleges and 26% Students were in private medical colleges. Among the total students maximum population (about 87%) were single , 13% students were married and only few, 1% students were divorced.

Among 400 students, 22.25% population were diagnosed with PCOS, another study done on 252 non medical female students in Bishop Heber College, Trichirapalli, Tamil Nadu India; found that the prevalence was 7.14% which was not comparable to our study. ((Nivetha and Susan., 2016). Another relevant study was conducted to assess awareness of polycystic ovarian syndrome among Saudi females and the prevalence of PCOS patients was 15.3%. (Alessa et al., 2017)

This study shows that, majority of the population (66.94%) were minimally aware about PCOS, 30.85% students were not aware about PCOS and 2.20% were very about PCOS. Another relevant study was conducted to assess awareness of polycystic ovarian syndrome among Saudi females. The level of awareness of PCOS in this study was 56.7%. (Alessa et al., 2017). Another relevant study was done to assess Prevalence and Knowledge of Polycystic Ovary

Syndrome (PCOS) among female Science Students of different public universities of Quetta, Pakistan. In this study, they found that 374 (72.5%) respondents were not aware of PCOS. 407(90.2%) subjects were having adequate knowledge about PCOS. (Haq et al., 2017)

Among 400 students ,6.77% population thought that PCOS is a manageable disease ,a another study conducted a survey on female of Mumbai and Navi Mumbai and in this study 81% population thought that PCOS is a manageable disease which was not comparable to our study.(Pitchai et al., 2016)

We found in our study, 22% population identified difficulty of pregnancy as symptoms of PCOS,20% identified pelvic pain,19% identified irregular peroids, 8% population identified weight gain,7% population identified abnormal hair growth ,and 2 % of population identified others option as symptoms of PCOS among study of population,where another relevant study was conducted on symptoms and awareness in urban Pakistani Women. In this study , 36.7%out of 177 subjects identified hirsutism, Regarding menstruation 14% identified some sort of irregularity,9% women identified oligomenorrhoea, 3% women identified amenorrhea. (Gul et al., 2014)

In our study, we found that 2.25% population received treatment for acne, 8.99% population was controlling their diet and 13.48% patient was exercising. Another relevant study was conducted on patients of various hospital of Palakkad,Kerala,India. It was found from the study that , 2.8% population received treatment for acne, 28.94% patients controlled their diet and 25.9% patients were exercising.(Francis et al., 2017)

Among 400 students ,maximum 82.02% patients had information of PCOS from doctor, 17.98%patient had information from media, 11.24% patient had information from internet and only a very few 1.12% had information from physiotherapist. Another relevant study was conducted to assessknowledge on PCOS among medical students in Mumbai. It was found from the study that 33% adolescent and young girls had information about PCOS from teacher, 19% got information.

From friend, 11.5% got information from a doctor, 3.5% got information from newspaper while 5% got information from internet. (Jayshree and Chaitanya, 2017)

In our study, we found that 74% of the population thought that exercise help in the prevention of PCOS. Where another relevant study was conducted on female of Mumbai; 64% population thought that exercise help in prevention of PCOS. (Pitchai et al., 2016)

In this study, it was found that ,33.71% felt frustation,28.09% were identified with depression ,13.48% were identified with anxiety,17.98% were identified with embarrassment and minimum 2.25% were experienced hopelessness.Another relevant study was conducted on patients of various hospital of Palakkad,Kerala,India. It was found from the study that, 46.75% study population were feeling depression followed by anxiety (18.4%), hopelessness (4.18%). (Francis et al., 2017)

So, in future steps should be taken from government level to make future doctors more aware about the knowledge of Poly Cystic Ovarian syndrome. In this regard more educational programs, awareness programme conferences should be designed to provide information about PCOS to the future doctor.

5.2 Conclusion

This study concludes that the level of knowledge about the causes, sign and symptoms of PCOS is insufficient; we consider it is necessary to improve knowledge about PCOS. From this study we see that, the level of knowledge about PCOS is unsatisfactory. Students knowledge of PCOS is insufficient in most aspects eg, diagnosis, treatment. PCOS awareness programs should incorporate these aspects with additional focus on education of PCOS. Thus, an effective information transfer mechanism is needed to overcome this problem. The suggestion to upgrade the system to promote awareness about PCOS should be conducted via the most effective medium. For example the selected media are television, newspaper and social network. More educational programs, conferences should be designed to provide comprehensive information and awareness on Polycystic Ovarian Syndrome.

**KNOWLEDGE AND AWARENESS OF POLY CYSTIC OVARIAN SYNDROME
AMONG FEMALE MEDICAL STUDENTS IN DHAKA**

(Department of Pharmacy, East West University)

(All the questions asked are used for research purpose only and all the information is kept confidential) **Place a tick (√) on your choice of answer**

DEMOGRAPHIC INFORMATION

1. Name (*if interested*): _____
2. Age: _____
3. Religion: Islam Hindu Buddhist Christian Others: _____
4. Education: Illiterate Primary school (Class 1 to 5) High school (Class 6 to 10)
 College University Others: _____
5. Occupation: Student Teacher Business Administration IT Retired Housewife

If you are a student, answer question 6-7

6. What department do you study in?
 Medical Business Administration CSE EEE English Law Others: _____
7. What kind of institution do you study in? Public Private Mixed
8. Marital status: Single Married Divorced Widowed
9. Net household income (BDT) : No income < Tk 5000 Tk 5000-10,000 Tk 10,000-50,000 >Tk 50,000

Poly Cystic Ovarian Syndrome (PCOS) RELATED INFORMATION

10. Have you ever heard PCOS about? Yes No
11. What is your level of awareness? Not at all Minimally aware Somewhat aware
 Very aware
12. What is your perception about PCOS? It's a fatal disease It's not curable
 It's manageable No idea
13. What are the risk factors of PCOS?
 High cholesterol Obesity Type 2 diabetes Family history Cardiovascular disease
 High Blood Pressure

Chapter-6

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