KNOWLEDGE AND AWARENESS OF POLY CYSTIC OVARIAN SYNDROME AMONG UNIVERSITY STUDENTS IN NARAYANGONJ

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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Declaration by the Research Candidate

 I, **FarhanaMazia**, ID: 2014-1-70-055 hereby declare that the dissertation entitled "KNOWLEDGE AND AWARENESS OF POLY CYSTIC OVARIAN SYNDROME AMONG UNIVERSITY STUDENTS IN NARAYANGONJ'' 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 **TilkaFannana**, Senior Lecturer, Department of Pharmacy, East West University, Dhaka, Bangladesh.

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This is to certify that the dissertation entitled "KNOWLEDGE AND AWARENESS OF POLY CYSTIC OVARIAN SYNDROME AMONG UNIVERSITY STUDENTS IN NARAYANGONJ'' submitted to the Department of Pharmacy, East West University for the partial fulfillment of the requirement for the award of the degree Bachelor of Pharmacy is a bonafied record of original and genuine research work carried out by **FarhanaMazia**, ID: 2014-1-70-055, under the supervision and guidance of **TilkaFannana**, Senior Lecturer, Department of Pharmacy, East West University and no part of this project has been submitted to other degree.

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PCOS -Polycystic ovarian syndrome

IR- Insulin-Resistant

DHEA –Dehydroepiandrosterone

OCP- Oral contraceptives

Abstract

Polycystic ovarian syndrome (PCOS) is a common endocrine system disorder among women of reproductive age. In PCOS, woman's hormones are out of balance. It can cause problems with periods and make it difficult to get pregnant. If it is not treated, over time it can lead to serious health problems, such as diabetes and heart disease. Early diagnosis is necessary for early interventions to minimize the immediate and chronic consequences. This study is an attempt to assess the knowledge and awareness of PCOS in the girl students of a 4 different universities in Narayangonj. 62.75% of the students were not aware of PCOS and 50.5% of the student thought that PCOS is manageable one. Out of 400 students, only 4.75% of students were diagnosed PCOS and out of this, 21.05% of the students had family history about PCOS and 94.73% said that they were informed about PCOS from doctors. 67.25% of the students were aware of irregular period as a common a sign and symptoms of PCOS and 60.25% of the students thought that infertility is a major complication of PCOS. 36.75% of the students thought that exercise could help in prevention of PCOS and out of this 54.42% of the students thought exercise could help in weight reduction. Majority of students around 71.5% of the students mentioned that PCOS can be treated by medication. Efforts need to be given to intensify awareness in the general public about PCOS. From this newly gathered knowledge, individuals may be able to protect themselves from some of the negative consequences associated with PCOS.

Key words : PCOS, reproductive age, infertility

This Research paper is

Dedicated

To my Beloved Parents

Chapter-1

Introduction

1.1 Overview

Polycystic ovarian syndrome (PCOS) is a common endocrine system disorder among women of reproductive age. In this condition women have enlarged ovaries that contain small collections of fluid called follicles that located in each ovary. Infrequent or prolonged menstrual periods, acne, excess hair growth and obesity can all occur in women with polycystic ovary syndrome. In adolescents, infrequent or absent menstruation may raise suspicion for the condition. (Mayoclinic.org, 2017)

In PCOS, woman's hormones are out of balance. It can cause problems with periods and make it difficult to getpregnant. If it is not treated, over time it can lead to serious health problems, such as diabetes and heart disease. PCOS grow many small cysts on their ovaries. That is why it is called polycystic ovarian syndrome. These cysts are not cancerous but lead to hormone imbalances. As we know hormones are chemical messengers that trigger many different processes, including growth and energy production. Often, the job of one hormone is to signal the release of another hormone.As in PCOS, hormones are out of balance so one hormone change triggers another, which changes another. For example:

- ✓ The sex hormones get out of balance. Normally, the ovaries make a tiny amount of male sex hormones (androgens). In PCOS, they start making slightly more androgens. This may cause women to stop ovulating, get acne, and grow extra facial and body hair.
- ✓ The body may have a problem using insulin, called insulin resistance. When the body does not use insulin well, blood sugar levels go up. Over time, this increases chances of getting diabetes.(WebMD, 2014)

PCOS affects 7 – 10% of women of childbearing age and is the most common cause of infertility. In the United States, an estimated 5 to 6 million women have PCOS. PCOS is the most common hormonal disorder among women of reproductive age, but many women do not know they have it. It is also a metabolic problem that affects several body systems. Women with PCOS who are overweight or obese can also develop a condition called obstructive sleep apnea, when breathing stops repeatedly during sleep. (Hormone Health Network, 2010)

1.2 Normal Ovary

The ovaries are small, walnut - sized lumps of tissue that are about one inch away from the top of the uterus on either side. They are off-white, and, in young girls and adolescents, are smooth. After the onset of menstruation, however, the ovaries begin to go through a series of events that leads to a change in their appearance.

Just prior to ovulation, a small (1/2 inch) clear collection of fluid forms around the developing egg and becomes visible below the surface of the ovary. This combination of the fluid, hormone producing cells and the egg is called a *follicle*. During ovulation, the surface of the ovary bursts open, and the egg is carried away in a surge of fluid towards the fallopian tube. The surface cells of the ovary heal quickly, leaving behind a yellow-appearing pocket of cells called the corpus luteum. The corpus luteum produces the hormone progesterone, but if no pregnancy occurs, it disappears shortly after the menstrual period. As time goes on, the surface of the ovary becomes pitted and irregular, evidence of many ovulations and subsequent healings. After the menopause, the monthly formation of follicles and ovulation cease. The ovaries decrease in size to that of an almond and become a pale white.(Parkeret al, 2005)
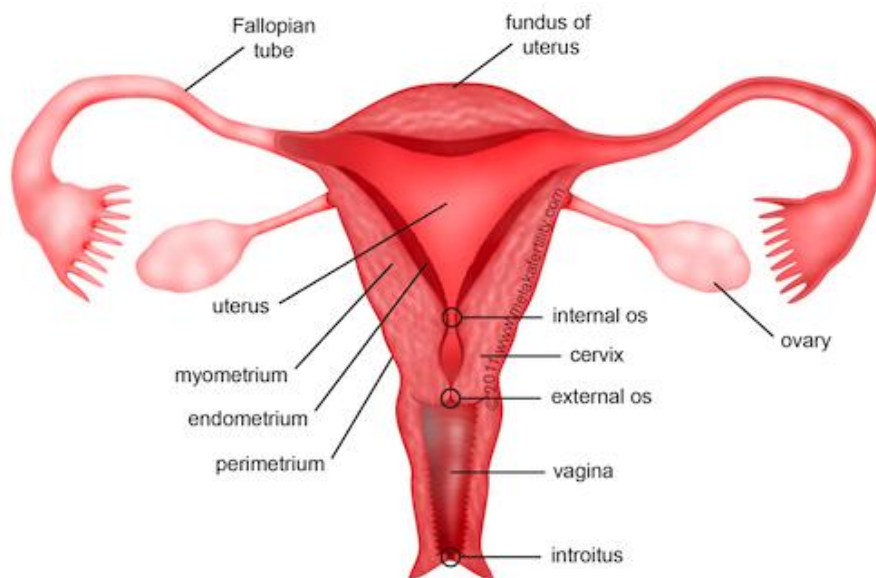
Fig 1.1: Reproductive system (adapted from ThingLink.com)

1.3 Ovarian cysts

Most women will experience a cyst on the ovaries at least once, and most are painless, cause no symptoms, and are discovered during a routine pelvic exam. Symptoms of an ovarian cyst include nausea, vomiting, bloating, painful bowel movements, and pain during sex. In rare cases, an ovarian cyst can cause serious problems. The ovaries are part of the female reproductive system. They are located in the lower abdomen on both sides of the uterus. Women have two ovaries that produce eggs, as well as the hormones estrogen and progesterone.
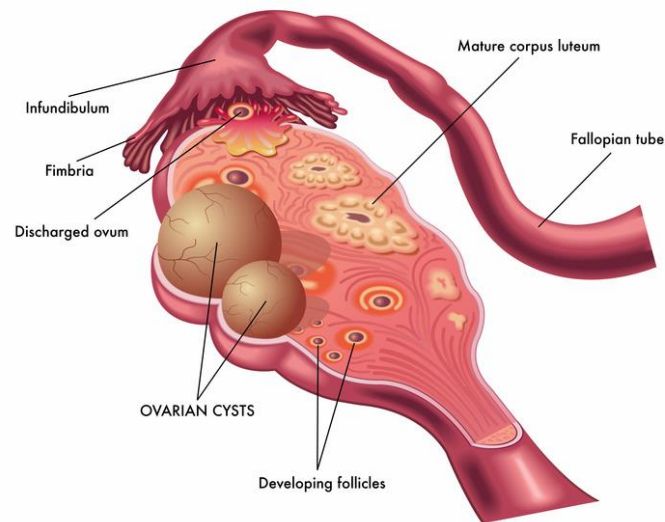
Fig 1.2: Cyst containing ovary(adapted from Omnicare Women's Health)

1.4 Types of ovarian cysts

There are various types of ovarian cysts, such as dermoid cysts and endometrioma cysts. However, functional cysts are the most common type. The two types of functional cysts include follicle and corpus luteum cysts.

- **Follicle cyst**

   During a woman's menstrual cycle, an egg grows in a sac called a follicle. This sac is located inside the ovaries. In most cases, this follicle or sac breaks open and releases an

egg. But if the follicle doesn't break open, the fluid inside the follicle can form a cyst on the ovary.

- **Corpus luteum cysts**

Follicle sacs typically dissolve after releasing an egg. But if the sac does not dissolve and the opening of the follicle seals, additional fluid can develop inside the sac and this accumulation of fluid causes a corpus luteum cyst.

Other types of ovarian cysts include:

- ✓ Dermoid cysts: sac-like growths on the ovaries that can contain hair, fat, and other tissue
- ✓ Cystadenomas: non-cancerous growths that can develop on the outer surface of the ovaries
- ✓ Endometriomas: tissues that normally grow inside the uterus can develop outside the uterus and attach to the ovaries, resulting in a cyst.

Some women develop a condition called polycystic ovarian syndrome. This condition means the ovaries contain a large number of small cysts. It can cause the ovaries to enlarge, and if left untreated, polycystic ovaries can cause infertility.(Higuera, 2015)
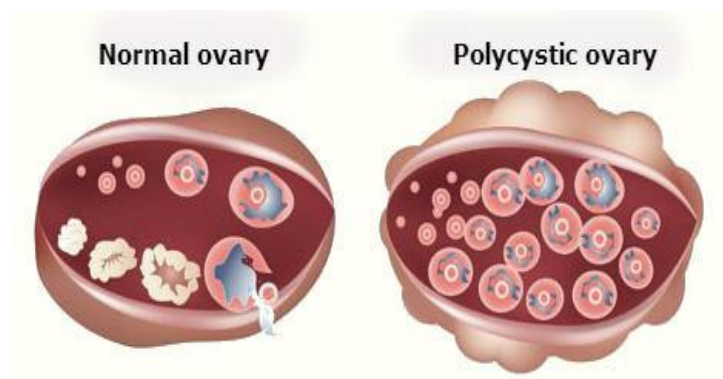
Fig 1.3: Normal ovary and polycystic ovary(adapted from Invitra.com)

1.5 Pathophysiology of polycystic ovarian syndrome

The pathophysiology of PCOS is not well understood, mainly due to lack of knowledge of the location of the primary defect. There are several candidates: ovary, adrenal, hypothalamus, pituitary, or insulin-sensitive tissues. It is possible that there are sub-sets of women with PCOS wherein each of these proposed mechanisms serves as the primary defect.
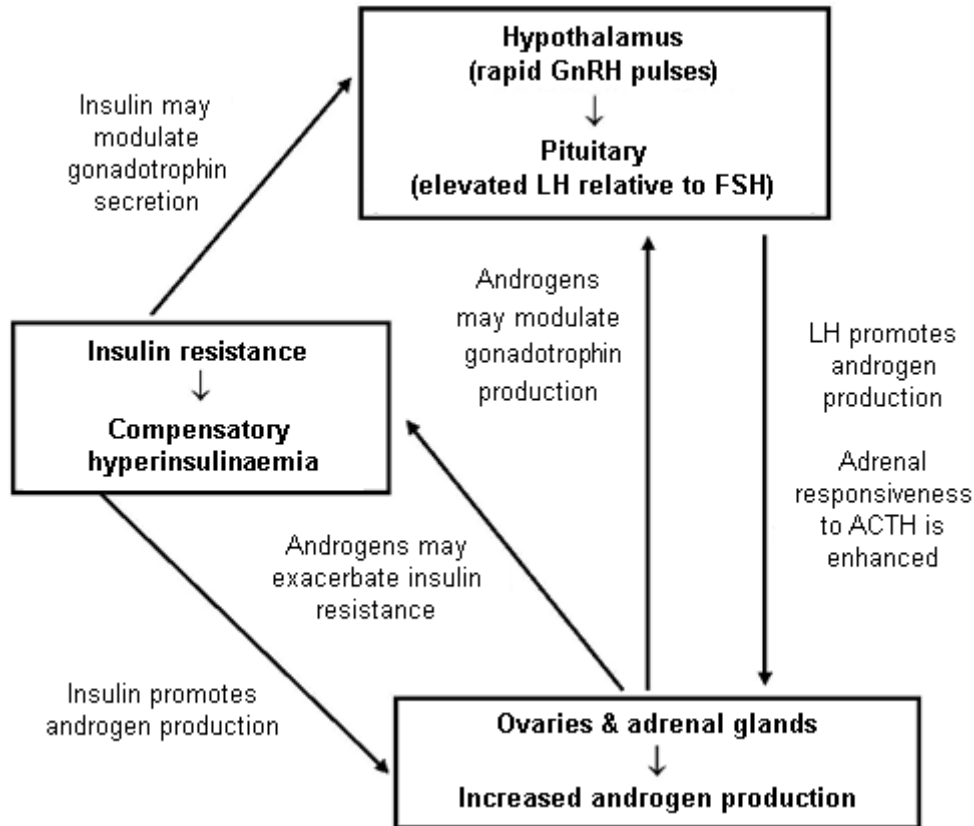
Fig 1.4: Simplified diagram of the main pathogenic factors in PCOS

Investigations have elucidated some of the interactions between these systems. Insulin resistance leads to compensatory insulin hypersecretion by the pancreas in order to maintain normoglycaemia. The resulting hyperinsulinaemia promotes ovarian androgen output and may also promote adrenal androgen output. High insulin levels also suppress hepatic production of sex hormone binding globulin (SHBG), which exacerbates hyper-androgenaemia by increasing the proportion of free circulating androgens. Another factor that promotes ovarian androgen

output is the fact that women with PCOS are exposed long term to high levels of LH. This LH excess seems to be a result of an increased frequency of gonadotrophin-releasing hormone pulses from the hypothalamus. The abnormal hormonal milieu also probably contributes to incomplete follicular development which results in polycystic ovarian morphology.(BMJ Publishing Group, 2017)

1.6 Types of Polycystic Ovarian Syndrome

Presentations of PCOS can typically be broken down into two categories: Insulin-Resistant PCOS and Non-Insulin-Resistant PCOS. The variations in these presentations can create confusion surrounding the disease, as well as the best treatment options.

- **Insulin-Resistant PCOS (IR)**

Insulin-Resistant PCOS is also referred to as Type 1 PCOS, and it is what is most often associated with the classic symptoms of PCOS. These include weight gain, ovulatory interruptions, facial hair, hair loss and acne. Those with Insulin-Resistant PCOS also exhibit a greater potential for developing diabetes and increased testosterone levels – both of which are actually caused by the underlying insulin and leptin resistance. In fact, the insulin and leptin resistance experienced by these patients is the culprit behind many of the unbecoming symptoms they face at the hands of this disease. It leads to the increased weight gain, for instance, and the resulting excess in testosterone is to blame for the combined hair loss and facial hair growth. The goal for treating Insulin-Resistant PCOS is to improve insulin sensitivity. Often doctors will prescribe weight loss, but it can be difficult for patients with this type of PCOS to lose weight. It requires extra dedication to both diet and exercise, and an understanding that the weight will not come off as quickly as it may for others. However, when weight loss is achieved, symptoms do typically subside. Medications to lower blood sugar are also often prescribed, although there have been natural alternatives – such as Inositol – which have been found to be just as effective in some cases.

- **Non-Insulin Resistant PCOS**

There are some women who meet the diagnostic criteria for PCOS, but who don't present with insulin resistance. This is what is referred to as Type 2, or Non-Insulin Resistant, PCOS. There

can be a variety of causes for this type of PCOS, including Vitamin D or Iodine deficiency, hormone-disrupting toxins, thyroid disease, and adrenal stress. For women experiencing Non-Insulin Resistant PCOS, blood sugar lowering drugs will have no effect on the condition, and neither will reducing weight or going on the pill. (Natural Fertility Info, 2017)

- **Immune Related PCOS**

This 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 (Dehydroepiandrosterone).

Women with family or past medical history of other immune dysfunctions, like autoimmune conditions, may be more likely to develop this type of PCOS. Immune system dysfunction causes chronic inflammation that eventually leads to elevated androgens.

- **Post-Pill PCOS**

This type of PCOS generally occurs because there is a fairly obvious cause 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.

After years of the pill hijacking woman's hormones, the body has a hard time producing its own Estrogen and Progesterone again, making ovulation natural or non-existent.

- **Environmental PCOS**

This is the simplest, type of PCOS where there is a single environmental (or other hormonal) imbalance that is interfering with 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.

In patients who are sensitive, certain food choices can play around with the body's ability to ovulate. For example, patients begin to ovulate regularly after taking soy out of their diets, by properly supplementing a strict vegetarian diet, or by removing artificial sweeteners. (Acubalance wellness center, 2017).

1.7 Risk Factors of PCOS

A risk factor is anything that increases the chance of getting a disease, with different risk factors for different diseases. The exact cause of PCOS is not known. Factors that might play a role include:

- **Excess insulin.** Insulin is the hormone produced in the pancreas that allows cells to use sugar, your body's primary energy supply. If your cells become resistant to the action of insulin, then your blood sugar levels can rise and your body might produce more insulin. Excess insulin might increase androgen production, causing difficulty with ovulation.

- **Low-grade inflammation.** This term is used to describe white blood cells' production of substances to fight infection. Research has shown that women with PCOS have a type of low-grade inflammation that stimulates polycystic ovaries to produce androgens, which can lead to heart and blood vessel problems.

- **Heredity.** Research suggests that certain genes might be linked to PCOS.

- **Excess androgen.** The ovaries produce abnormally high levels of androgen, resulting in hirsutism and acne.(Mayoclinic.org, 2017)

1.8 Sign and Symptoms of PCOS

Symptoms of PCOS may begin shortly after puberty, but can also develop during the later teen years and early adulthood. Because symptoms may be attributed to other causes or go unnoticed, PCOS may go undiagnosed for some time.Women with PCOS typically have irregular or missed periods as a result of not ovulating. Although some women may develop cysts on their ovaries, many women do not.

Other symptoms include:

- **Weight gain**: About half of women with PCOS will have weight gain and obesity that is difficult to manage.
- **Fatigue**: Many women with PCOS report increased fatigue and low energy. Related issues such as poor sleep may contribute to the feeling of fatigue.
- **Unwanted hair growth (also known as hirsutism)**: Areas affected by excess hair growth may include the face, arms, back, chest, thumbs, toes, and abdomen. Hirsutism related to PCOS is due to hormonal changes in androgens.

- **Thinning hair on the head**: Hair loss related to PCOS may increase in middle age.
- **Infertility**: PCOS is a leading cause of female infertility. However, not every woman with PCOS is the same. Although some women may need the assistance of fertility treatments, others are able to conceive naturally.
- **Acne**: Hormonal changes related to androgens can lead to acne problems. Other skin changes such as the development of skin tags and darkened patches of skin are also related to PCOS.
- **Mood changes**: Having PCOS can increase the likelihood of mood swings, depression, and anxiety.
- **Pelvic pain**: Pelvic pain may occur with periods, along with heavy bleeding. It may also occur when a woman isn't bleeding.
- **Headaches**: Hormonal changes prompt headaches.
- **Sleep problems**: Women with PCOS often report problems such as insomnia or poor sleep. There are many factors that can affect sleep, but PCOS has been linked to a sleep disorder called sleep apnea. With sleep apnea, a person will stop breathing for short periods of time during sleep.(PCOS Awareness Association, 2017)

1.9 Diagnosis of PCOS

A diagnosis of polycystic ovary syndrome can be made when at least two out of three of the following criteria are met:

- ➢ The ovaries are "polycystic" because:
  - ✓ 12 or more follicles are visible on one ovary or
  - ✓ the size of one or both ovaries is increased
- ➢ There are:
  - ✓ high levels of 'male' hormones (androgens) in the blood (hyperandrogenism)
  - ✓ Symptoms suggesting an excess of androgens such as excess hair growth, acne.

- ➢ There is menstrual dysfunction such as:
  - ✓ lack of periods or menses (menstrual flow)
  - ✓ menstrual irregularity
  - ✓ lack of ovulation (where an egg is released)

With these criteria, a woman can be diagnosed with PCOS even if she has regular periods or normal androgen levels. This means women with PCOS can experience very different types of symptoms. To make a correct diagnosis of PCOS a number of other conditions that could cause similar symptoms of menstrual dysfunction need to be ruled out.

Below there are some of the tests that are recommended to test for PCOS and to exclude other conditions. Not all tests are necessary for every woman.

1.9.1 Ultrasound

An ultrasound of the uterus, ovaries and the pelvis can be carried out to identify whether there are any cysts on your ovaries and whether an ovary is enlarged. A transvaginal ultrasound is a painless test with no radiation. It uses a pen–shaped probe with an ultrasound sensor on the tip, which is inserted into the vagina. This produces a much clearer picture than an abdominal ultrasound.

Transvaginal ultrasounds are only performed on women who have been sexually active; otherwise an abdominal scan is done where the ovaries are viewed from the outside through the stomach wall.

1.9.2 Blood tests

> **Hormonal blood tests**

Blood tests are used to assess the levels of androgens in your body. Blood tests for androgens (such as testosterone) and free androgen index (FAI) are the best tests for diagnosing whether you have hyperandrogenism (high androgen levels).

Other blood tests that can be useful in identifying high androgen levels include:

✓ sex hormone binding–globulin (SHBG)

✓ dehydroepiandrosterone sulphate (DHEAS)

✓ androstenedione

Blood tests may also be done to assess the levels of other reproductive hormones in body as these may affect your menstruation. These may include testing levels of:

✓ oestradiol (oestrogen)

✓ follicle stimulating hormone (FSH)

✓ luteinizing hormone (LH)

Blood tests to exclude other conditions that have similar symptoms to PCOS may measure the levels of:

✓ thyroid stimulating hormone (TSH)

✓ prolactin

✓ hormones related to adrenal function (glands found above the kidney), e.g. 17-hydroxyprogesterone

➢ **Other blood tests**

Assessing the risk of developing cardiovascular disease and diabetes is important when testing for PCOS because there are links between PCOS and insulin resistance and being overweight. Blood tests to assess these risks will measure:

• cholesterol

• blood pressure

• glucose metabolism/ tolerance

1.9.3 Testing adolescents for PCOS

In adolescents, menstrual cycles can be irregular for reasons unrelated to PCOS. It is best to wait for two years of irregular periods before assessing whether the cause is PCOS, unless there are other bothersome symptoms such as excess hair growth, acne or weight excess.

1.9.4 Testing for PCOS when taking an oral contraceptive pill

Taking the oral contraceptive pill changes reproductive hormone levels, so it is not possible to accurately measure androgen and other hormone levels if one is on the pill. To accurately measure androgen levels for a PCOS diagnosis, you may need to stop the oral contraceptive pill for three months and use other forms ofcontraception during this time.(Jeanhailes.org, 2017)

1.10 Complications

- **Infertility or Subfertility**

Many women do not realize they have PCOS until they see a doctor to determine why they cannot get pregnant. Infertility or subfertility (reduced fertility) is a common problem for women with PCOS. This may be due to the imbalance of hormones (including the ovaries' overproduction of the "male" hormone: testosterone). The ovaries may release ova (eggs) only infrequently. Although PCOS may reduce a woman's chances to become pregnant, the disease is not a substitute for birth control. Many women with PCOS do become pregnant, without medical assistance. Women who are sexually active and do not wish to conceive should consider using a contraceptive.

- **Endometrial Cancer (Endometrial Carcinoma)**

Women with PCOS appear to be at increased risk for developing cancer of the endometrium (lining of the uterus) later in life. From teens through menopause, all women experience a monthly buildup of the endometrial lining in the uterus, as the body prepares itself for the potential of a fertilized egg. If a woman does not become pregnant, the lining normally is shed through menstruation. Women with PCOS also experience the monthly buildup of the endometrial lining. However, the lining is not sufficiently shed because she has infrequent or nonexistent menstrual periods. Thus, the lining continues to build and can increase the risk of endometrial cancer.

- **Diabetes**

Insulin helps the body to metabolize or process glucose (blood sugar). Insulin resistance or impaired glucose tolerance have been linked to PCOS. Furthermore, high levels of insulin stimulate the production of testosterone, which aggravates the PCOS.By age 40, up to 40 percent of women with PCOS have some level of abnormal glucose tolerance, in the form of either diabetes or impaired glucose tolerance.

- **Lipid Abnormalities**

Hyperandrogenism (increased testosterone) can lead to an unfavorable lipid profile in women with PCOS. This means that a woman with PCOS may have an unfavorably high level of fat substances in her bloodstream. In some women, the blood lipid profile may show a lower rate of high-density lipoproteins (HDL, the "good" cholesterol) and a higher rate of low-density lipoproteins (LDL, the "bad" cholesterol). This imbalance increases the risk for cardiovascular disease.

- **Cardiovascular Risks**

Evidence suggests that women with PCOS are at increased risk for heart disease and other cardiovascular diseases. In addition, the tendency for women with PCOS to be overweight increases the risk of cardiovascular disease, just as obesity increases cardiovascular risk among women and men who do not have PCOS.

- **Obstructive Sleep Apnea**

Studies conducted at the University of Chicago have confirmed the exceptionally high risk of obstructive sleep apnea among women with PCOS. While it is clear that increased body weight contributes to this risk, women with PCOS seem to be at high risk as a consequence of other factors in addition to weight. For example, the high testosterone levels in PCOS also seem to play a role in the development of sleep apnea.(The University of Chicago Medical Center, 2017)

- **High blood pressure or Hypertension**

Women with polycystic ovary syndrome (PCOS) can add hypertension to the long list of metabolic complications they are at high risk for. Referred to as "the silent killer" for its

mostly absent warning signs, hypertension (high blood pressure) is a condition not to be taken lightly. (Grassi, 2017)

- **Miscarriage early loss of pregnancy**

Women with PCOS are three times as likely to miscarry in the early months of pregnancy as are women without PCOS.Some research shows that metformin may reduce the risk of miscarriage in pregnant women with PCOS. However, other studies have not confirmed that metformin reduces miscarriage risk, so more research needs to be done.(NICHD Research Information, 2017)

- **Obesity**

The link between PCOS and obesity is complicated. Signs and symptoms of polycystic ovarian syndrome begin for some females soon after they start having periods. Women with PCOS produce too much insulin, or the insulin they produce does not work as it should. The inability of insulin to function normally is one reason why women with PCOS tend to gain weight or have a hard time losing weight. For others, PCOS develops later on, following substantial weight gain. What is clear is that women affected by obesity have a greater risk for PCOS and women with PCOS have a greater risk for obesity. (Obesity Action Coalition, 2017)

1.11 Treatment of PCOS

The medical management of PCOS can be broken down into four components, three of which are "acute" issues (control of irregular menses, treatment of hirsutism and management of infertility) and one that is more "chronic." This latter issue may be the most important but least remembered by patients and providers alike–management of the IR (insulin resistant) syndrome. "Acute" issues that need management may change; however, a continuous life-long management approach is important for the IR of PCOS.

1.11.1 Control of irregular menses

This cardinal feature of PCOS can be both a nuisance and a significant health risk to patients. Irregular menses can be embarrassing because of unpredictability and painful because the

infrequent occurrence often leads to increased cramping with the heavier flow. Infrequent menstrual cycles also carry a 3-fold increased risk of endometrial carcinoma. In general, four menses per year are required to control this increased risk. Four common management options for control of irregular menses are given below:

- ✓ Oral contraceptives

- ✓ Periodic progesterone withdrawal

- ✓ Lifestyle modification/weight loss

- ✓ Metformin

1.11.2 Treatment of Hirsutism

Hirsutism can be measured and quantified by a variety of methods. However, the decision of if and when to treat should be based on the patient's perception of the excess terminal hair growth. A similar degree of hirsutism in two different patients may result in vastly different degrees of distress. When thought of simply, hirsutism can be managed in two ways: through medical means by decreasing the amount or blocking the action of androgens or by mechanical means (i.e., shaving, etc.). These options are listed below:

A. Biochemical

➢ Decreasing testosterone production

- ✓ Oral contraceptives

- ✓ Lifestyle modification/weight loss

- ✓ Metformin

➢ Decreasing testosterone actions

- ✓ Anti-androgens (spironolactone)

- ✓ Lifestyle modification/weight loss

- ✓ Metformin

B. Mechanical

✓ Plucking/shaving/electrolysis/laser

✓ Eflornithine hydrochloride 13.9**%**

1.11.3 Treatment of Infertility

PCOS accounts for 75% of anovulatory infertility. Additionally, if/when pregnancies do occur, the first trimester miscarriage rate is as high as 30% to 50%. Successful medical management of infertility in these patients can be extremely rewarding to patients and physicians alike. Management of infertility can be difficult, however, and a team approach between the endocrinologist, gynecologist and, perhaps, reproductive endocrinologist should be stressed. An extensive review of the intricacies of infertility management of the patient with PCOS is beyond the scope of this review. Instead, a brief discussion of the relative resistance to clomiphene therapy in PCOS will be undertaken followed by a more in depth look at the potential utility of methods aimed at improving insulin sensitivity (with a focus on metformin).

> **Clomiphene citrate**

The degree of obesity correlates with the dose of clomiphene needed to induce ovulation. The higher doses of clomiphene often required may cause side effects and can increase the rate of multiple gestations.Clomiphene has been extensively studied in combination with metformin.

> **Lifestyle modification/ weight loss**

Weight loss reduces hyperinsulinemia and subsequently hyperandrogenism. Lifestyle modification needs to be stressed in the treatment of infertility. However, many patients will have difficulty in achieving weight loss.

> **Metformin**

Recently, metformin therapy continued throughout pregnancy has been shown to reduce this risk of early pregnancy loss. Once pregnancy is achieved in PCOS patients, the first-trimester miscarriage rate is 3-fold higher than that of normal women In a retrospective study of women who became pregnant on metformin and continued it throughout pregnancy, the rate of early pregnancy loss was 8.8% compared to 41.9% of women who were not on the drug.

1.11.4 Diabetes risk and long term treatment of IR in PCOS

Most PCOS patients are inherently IR (insulin resistant) with the obesity seen in many, only adding to this problem. Perhaps not surprisingly then a substantial proportion of PCOS patients have abnormalities on the oral glucose tolerance testing at the time of diagnosis. With the high prevalence of abnormalities in glucose tolerance in PCOS and the significant impact this might have on patients' health, much has been done to evaluate the effects of insulin sensitizers in this regard. Metformin is perhaps the most widely studied agent thus far and most, but not all*uncontrolled* studies have shown a significant improvement in insulin sensitivity.Troglitazone has similar effects in PCOS patients. (Michael, 2004)

1.11.5 Surgery

A minor surgical procedure called laparoscopic ovarian drilling (LOD) may be a treatment option for fertility problems associated with PCOS.Under general anesthetic,the doctor will make a small cut in the lower abdomen and pass a long, thin microscope called a laparoscope through into the abdomen. The ovaries will then be surgically treated using heat or a laser to destroy the tissue that's producing androgens (male hormones). LOD has been found to lower levels of testosterone and luteinising hormone (LH) and raise levels of follicle-stimulating hormone (FSH). This corrects the hormone imbalance and can restore the normal function of ovaries.(NHS Choices Information, 2016)

1.11.6 Androgenetic Alopecia

Thinning hair due to the effects of male hormones (androgens) is called androgenic alopecia. It is a major source of psychological distress to women. This male-pattern hair loss is often seen in women with polycystic ovary syndrome (PCOS). Certain drugs, anemias, nutritional deficiencies, and severe illnesses and infections may be a trigger for diffuse hair loss.

- ✓ Oral contraceptives (OCP) in combination with spironolactone
- ✓ Diane-35 (containing cyproterone acetate and ethinyl estradiol)
- ✓ OCP (oral contraceptive) in combination with a 5-alpha reductase inhibitor
- ✓ OCP (oral contraceptive) with flutamide.

- ✓ Multiple drug therapy
- ✓ Minoxidil   (Futterweit, 2011)

1.12 Prevention of PCOS

Polycystic ovary syndrome (PCOS) cannot be prevented. But early diagnosis and treatment helps prevent long-term complications, such as infertility, metabolic syndrome, obesity, diabetes, and heart disease.

1.11.1 Healthy eating and exercise

- ✓ **Eat a balanced diet:** A diet that includes lots of fruits, vegetables, whole grains, and low-fat dairy products supplies our body's nutritional needs, satisfies hunger, and decreases cravings. And a healthy diet makes us feel better and have more energy.

- ✓ **Physical activity** Walking is one of the best activities. Fitness activities help to boost our motivation. Having a walking or exercise is a great way to stay active.

1.12.2 Weight control and weight loss

Losing weight will lower the risks for diabetes, high blood pressure (hypertension), and high cholesterol.A modest weight loss can improve high androgen and high insulin levels and infertility.Weight loss of as little as 5% to 7% over 6 months can reduce androgen levels enough to restore ovulation and fertility in more than 75% of women who have PCOS.

1.12.3 Cessation of smoking

Women who smoke have higher levels of androgens than women who don't smoke.Smoking also increases the risk for heart disease.

1.12.4 Caring for skin and hair

- ✓ **Acne** treatment may include nonprescription or prescription medicines. Some women notice an improvement in their acne after using estrogen-progestin hormone pills.

- ✓ **Excess hair growth** (hirsutism) slows when high androgen levels decrease. In the meantime,unwanted hair can be treated or removed with:

  - ➢ Laser hair removal, in which the hair follicle is destroyed by a laser beam.
  - ➢ Electrolysis, in which hair is permanently removed by electric current applied to the hair root.
  - ➢ Depilatories, which are chemical hair removal products applied to the skin.
  - ➢ Waxing, this pulls the hair out by the root.
  - ➢ Shaving.
  - ➢ Tweezing.
  - ➢ Bleaching.(WebMD, 2017)

1.13 Prevalence of Polycystic Ovarian Syndrome

The word 'prevalence' of polycystic ovarian syndrome usually means the estimated population of people who are managing polycystic ovary syndrome at any given time (i.e. people with PCOS). 5-10% women of childbearing age (20-40); 30% of women have some PCOS symptoms (NWHIC). Prevalence rate for PCOS is approx 1 in 40 or 2.50% or 6.8 million people in USA. The following table attempts to extrapolate the above prevalence rate for Polycystic Ovarian Syndrome to the populations of various countries and regions. These prevalence extrapolations for PCOS are only estimates, based on applying the prevalence rates from the US (or a similar country) to the population of other countries, and therefore may have very limited relevance to the actual prevalence of Polycystic OvarianSyndrome in different region:

Table 1.1: Prevalence of Polycystic Ovarian Syndrome in different region

Country/Region	Extrapolated Prevalence	Population Estimated Used
USA	7,341,385	293,655,405
Canada	812,696	32,507,874[2]
Brazil	4,602,527	184,101,109[2]
Iceland	7,349	293,966[2]
Sweden	224,660	8,986,400[2]
United Kingdom	1,506,767	60,270,708[2]
Austria	204,369	8,174,762[2]
Germany	2,060,615	82,424,609[2]
Switzerland	186,271	7,450,867[2]
Japan	3,183,325	127,333,002[2]
Bangladesh	3,533,511	141,340,476[2]
Bhutan	54,639	2,185,569[2]
India	26,626,765	1,065,070,607[2]
Pakistan	3,979,908	159,196,336[2]
Sri Lanka	497,629	19,905,165[2]
Saudi Arabia	644,898	25,795,938[2]

(Health Grades, 2014)

Chapter-2

Literature Review

Awareness of lifestyle modification in females diagnosed with polycystic ovarian syndrome in India: explorative study

The study was conducted to analyze the perception on PCOS, awareness on life style modification, emotional attributes, concern regarding PCOS and utilization of physiotherapy services. As we know polycystic ovarian syndrome (PCOS) is a heterogeneous clinical entity which develops different disease like metabolic, endocrine and reproductive disorder. In this study data was collected from 100 women who were diagnosed with PCOS. The study showed that 21% of the respondents were very well aware about PCOS, 51% reported as doctor as their main source of information about PCOS, 81% expressed that PCOS was manageable one, 62% were aware that exercise helps in the management of PCOS. Out of this, 39% were doing exercise on a regular basis. However all the study participants reported, they have not had any consultation from physiotherapist for their structured exercise program. 32% were attributed to anxiety after the diagnosis of PCOS. 64% of the respondents were aware that changing in diet or eating habits can influence in PCOS. However 95% of the subjects concurred to follow life style modification. So this study indicates that we should create awareness in the general public about PCOS as it adversely affects women at varying stages of their life. (Pitchai et a, 206)

PCOS: Symptoms and Awareness in Urban Pakistani Women

The aim of the study was to determine and interpret the prevalence of symptoms and awareness about PCOS. At present PCOS is the leading cause of infertility in women of child bearing age. To determine how many women had symptoms of this syndrome including hirsutism, amenorrhoea, dysmenorrhea and oligomenorrhoea was the main purpose of this study. The ratio of women who were aware of this disorder was also evaluated 177 females whose ages were between 20 -50 years participated in the study. 36.7% out of 177 subjects had hirsutism (Facial hair: 19.5%, Breast hair: 6.5%, other forms of hirsutism: 6.5%). Regarding menstruation 14% had some sort of irregularity. 9% women had oligomenorrhoea, 3% women had amenorrhea. On the whole 10% were familiar with PCOS. This study does not have sufficient evidence to establish the prevalence of PCOs through ultrasonography; thus only prevalence of amenorrhoea, oligomenorrhoea and hirsutism has been stated which can serve as a guideline towards finding the true prevalence PCOS in our society. (Gul et al, 2014)

A Study to Assess the Knowledge Regarding PCOS (Polycystic Ovarian Syndrome) among Nursing Students at NUINS (NitteUsha Institute of Nursing Sciences)

The study was conducted to assess the knowledge on the polycystic ovarian syndrome among the student nurses. Polycystic ovarian syndrome is a condition in which woman has an imbalance of female sex hormones. This may lead to changes in the menstrual cycle, cyst in the ovary, failure to conceive and other health problems. It is a common health problem among teenagers and young women. It affects 5% to 10% of women in their reproductive years. Lack of knowledge and lifestyle changes are considered to be the major factor leading to this phenomenon. There is a need to increase awareness among women so as to avoid major cases of fertility problems in the future. The study was conducted on 150B.Sc. nursing students of NUINS to assess the knowledge regarding PCOS. Students above 18 years of age were included in this study. Distribution of the samples on demographic characteristics revealed that 85% of the samples were in the age group of 21-25years, 75% of the samples were Christians, 82% of the samples were consuming mixed diet, and 92% samples had regular menstrual cycle. 76% of the samples were with average knowledge and 10.7% with good knowledge regarding polycystic ovarian syndrome. The study also showed that there is an association between knowledge on PCOS and demographic variables such as dietary pattern, consumption of non-vegetarian, consumption of junk food and source of information. (B. & Nayak, 2016)

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

This study is an attempt to assess the prevalence of polycystic ovarian syndrome in the girl students of a college and it also created awareness among girls about PCOS. PCOS is a common disorder, often complicated by chronic anovulatory infertility and hyperandrogenism with the clinical manifestation of oligomenorrhoea, hirsutism, acne, obesity; insulin resistance; and, in later life, infertility with diabetes mellitus and uterine cancer. Early diagnosis is necessary for early interventions to minimize the immediate and chronic consequences. This study was an attempt to assess its prevalence in the girl students of Bishop Heber College (Autonomous),

Trichirappalli City of Tamil Nadu. PCOS is currently considered as a lifestyle disorder affecting 2.2-26% of young girls in their reproductive age in India. The study population comprised about 252 girls from various departments. Results indicated that there are 7.14% of surveyed girls were having PCOS and the identified adolescents with risk for developing PCOS. From this newly gathered knowledge, individuals may be able to protect themselves from some of the negative consequences associated with PCOS. (Nivetha & Suganya, 2016)

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 aims of the study were to identify the adolescents with risk for developing PCOS and to find the effectiveness of awareness program. Polycystic Ovarian Syndrome (PCOS) is one of the most common female endocrine disorders affecting approximately 5-10% of women of reproductive age (15-45 years) and was thought to be one of the leading causes of female infertility. The major purpose of this study was to create awareness among adolescents about PCOS. This will help them to modify their life style and to have better reproductive life. The study was conducted in selected pre-university colleges of Udupi District and 752 students were selected from six colleges. The data were collected by using demographic proforma, risk assessment tool on PCOS to identify the risk status and to assess the knowledge level of students on PCOS. Out of 752 students, 650 (86.2%) of the students in the study group had low risk and 102 (13.4%) were at moderate risk for developing PCOS. None of the students had high risk for developing PCOS. So this study revealed that an awareness program could bring change in knowledge among young girls regarding PCOS and prevent future complications. (Shobha et al, 2014)

Awareness of PCOS (polycystic ovarian syndrome) in adolescent and young girls

The study was conducted to assess the knowledge on the polycystic ovarian syndrome (PCOS) among the medical students of 1st, 2nd and 3rd year in India; to find the source of information; to find the prevalence and to educate them about polycystic ovarian syndrome. It affects 5% to 10% of women in their reproductive years. These problems cause infertility as they suffer from hormonal imbalance in body. 200 medical students were participating in this study. In present study, 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. From this study, it was concluded that 72% of girls were aware of PCOS while 28% of girls were unaware of PCOS. So early diagnosis of PCOS and its prompt treatment will help the girls to improve quality of life and prevent further health hazards. (Upadhye ans Shembekar, 2017)

Awareness of polycystic ovarian syndrome among Saudi females

The study was conducted 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. The real causes of the syndrome have not been yet identified precisely and symptoms of presentation vary greatly from case to case, which makes it a challenge for physicians to diagnose. 2000 students were participating in this study. The level of awareness of PCOS in this study was 56.7%. Among them 15.3% were PCOS patient, 21.3% knew about PCOS via internet, then patient, doctors, and books, respectively. The level of awareness of PCOS was significantly related to higher educational levels and women with health college qualifications. Among aware females, the majority were aware of symptoms pertaining to endocrine disorders, contraception intake, and a healthy diet. There is a high level of awareness of PCOS among Saudi women and awareness of symptoms was also higher than that of complications. (Alessa et al, 2017)

Aim and Objectives of the Study

The main aim and objectives of the study-

- To create awareness of the Polycystic Ovarian Syndrome.

- To evaluate people's perception towards Polycystic Ovarian Syndrome.

- To educate the people about the risk factors of Polycystic Ovarian Syndrome (PCOS) since PCOS can be prevented by modifying lifestyle or avoiding the risk factor.

- To help the people to recognize the signs and symptoms of Polycystic Ovarian Syndrome, that will help them to seek treatment.

- To inform the people about the importance of PCOS check-ups.

- To determine factors that can influence a person's choice of answer (i.e demographic information such as age, education, occupation, income etc.), this information from survey audience is a great way to be able to split respondents into certain groups and see how groups vary with their answers.

Significance of the Study

The polycystic ovary syndrome (PCOS) is an extremely common disorder that occurs in 4% to 7% of women of reproductive age. 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 (Lobo &Carmina,2000). PCOS may represent one of the largest groups of women at high risk for the development of early onset coronary heart disease. A 2006 study found that of 78 adolescents with PCOS had a substantially higher risk of developing metabolic syndrome and hypertension compared with the general female adolescent population; this information was obtained from the third National Health and Nutrition Examination Survey (NHANES III). Early diagnosis of the syndrome and close long-term follow-up and screening for diabetes and cardiovascular disease are warranted. An opportunity exists for preventive therapy, which should improve the reproductive, metabolic, and cardiovascular risks. PCOS may also trigger infertility by causing stress and other psychosocial factors including distress, depression, anxiety, sexual problems, marital, and social maladjustment, loss of control, and lowered self-esteem. Approximately 20% of couples in western society experience infertility. Infertility occurs due to the ovulatory disturbances in PCOS and 100% of patients with PCOS suffer from ovulatory dysfunction according to the NIH 1990 criteria. Of this, 75% of women with PCOS will experience infertility (Brady et al. 2009). It has been found that greater than 25% of obese women with PCOS will develop impaired glucose or type 2diabetes. So it is important to diagnose the syndrome. Awareness for PCOS can lead to reduction of infertility in women and other disorder like endometrial cancer, metabolic or cardiovascular disorder. Ages between 15-30 years female are effected by PCOS. Thus to know the current statistics of the knowledge and awareness regarding PCOS among university students I decided to conduct a survey on "Knowledge and awareness of polycystic ovarian syndrome among university students in Narayangonj".

Chapter- 3

Methodology

3.1 Type of study

The study was a survey based study.

3.2 Study Area

The study was conducted in 4 different universities in Narayangonj, Bangladesh. The names of the universities are Narayangonj Govt. Mohila College, Narayangonj Govt. Tolaram College, HaziMisir Ali University College and Ranada Prasad Shaha University.

3.3 Study Population

The study was performed on 400 women among university students from August, 2017 to October, 2017.

3.4 Inclusion Criteria

In this survey only female university student were included.

3.5 Exclusion Criteria

In this survey,

- ❖ Males were excluded.
- ❖ Female that were not studying in university 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 attitude of polycystic ovarian syndrome among university students in Narayangonj, Bangladesh, a questionnaire was established in June 2017. Through this questionnaire, demographic information was collected along with some risk factors that contribute to the knowledge and awareness of polycystic ovarian syndrome among university students in Narayangonj.

3.7 Questionnaire Development

The questionnaire was developed based on some common criteria that influence the knowledge and awareness of polycystic ovarian syndrome among university student. 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 group, marital status, knowledge about PCOS, signs & symptoms, complications, family history etc. So some graphical representations were found that was visually representative of the targeted subject.

3.9 Ethics

The study was done without conflicting to ethical issues. Ethical consideration was checked by the research supervisor with the research policy of East West University. Oral consent was taken prior to study from the participants.

Chapter-4

Result

4.1 Distribution of age group in population
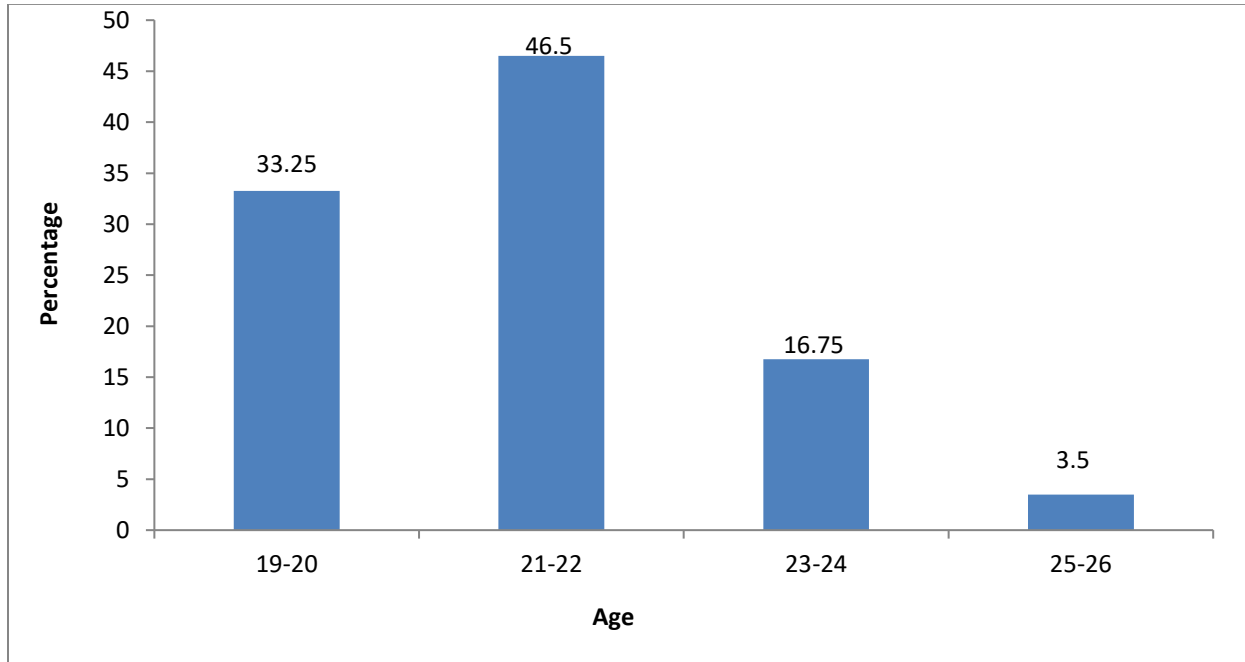
Fig 4.1: Distribution of age group in population

The study showed that among 400 women, 33.25% of the population belonged to the age group 19-20, 46.5% of the population belonged to the age group 21-22, 16.75% of the population belonged to the age group 23-24, and 3.5% of the population belonged to the age group 25-26.
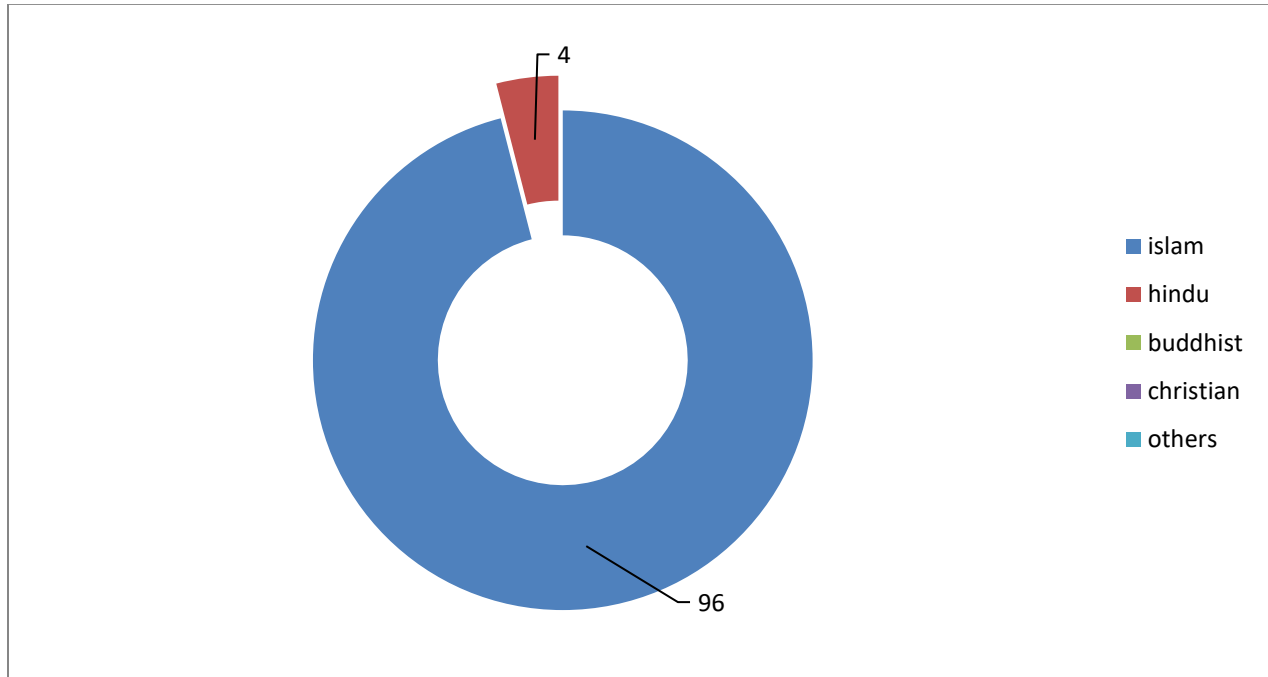
4.2Distribution of religion in population

Fig 4.2:Distribution of religion in population

The study showed that among 400 women, 96% of the populations were Muslim and 4% of the populations were Hindu.

4.3 Distribution of departments
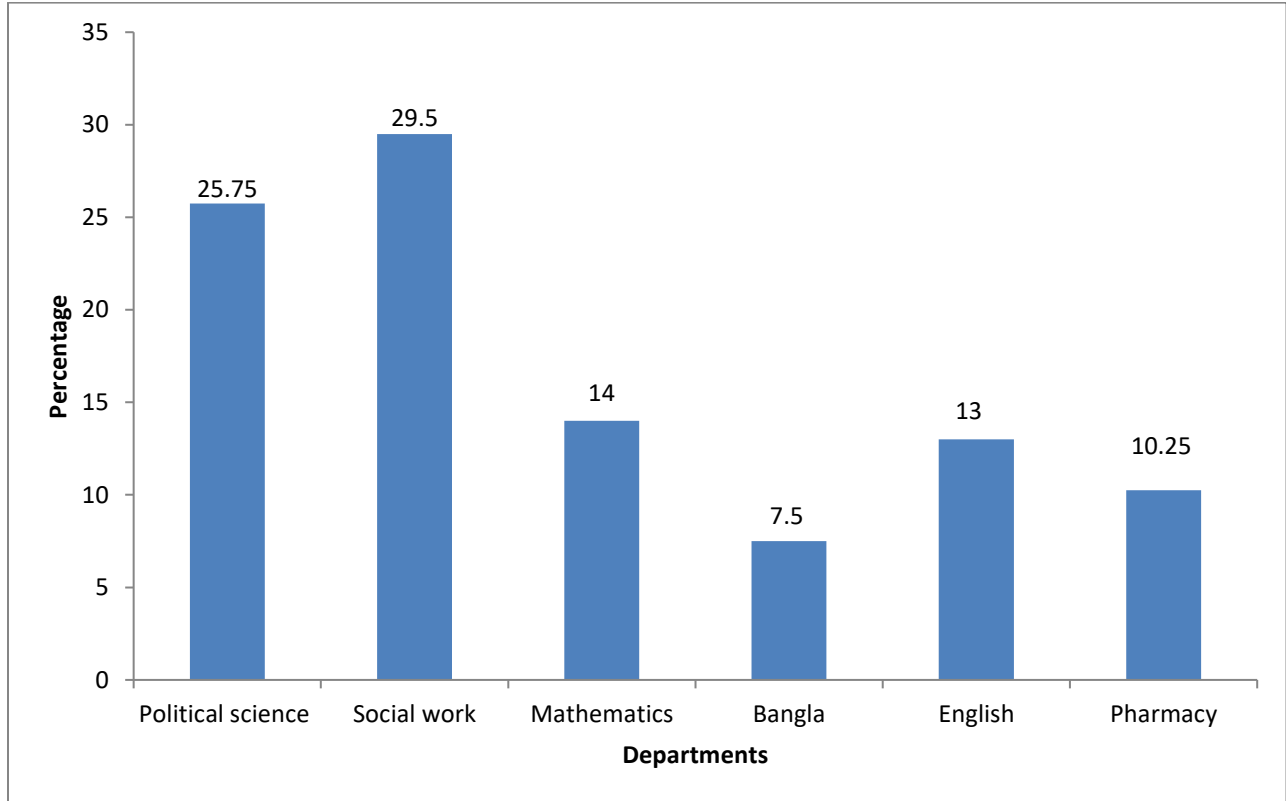
Fig 4.3: Distribution of departments

The study showed that among all the students 25.75% of the students studied in political science department, 29.5% of the students studied in social work department, 14% of the students studied in mathematics department, 7.5% of the students studied in Bangla department, 13% of the students studied in English department and 10.25% of the students studied in pharmacy department.

4.4 Distribution of students in different institution
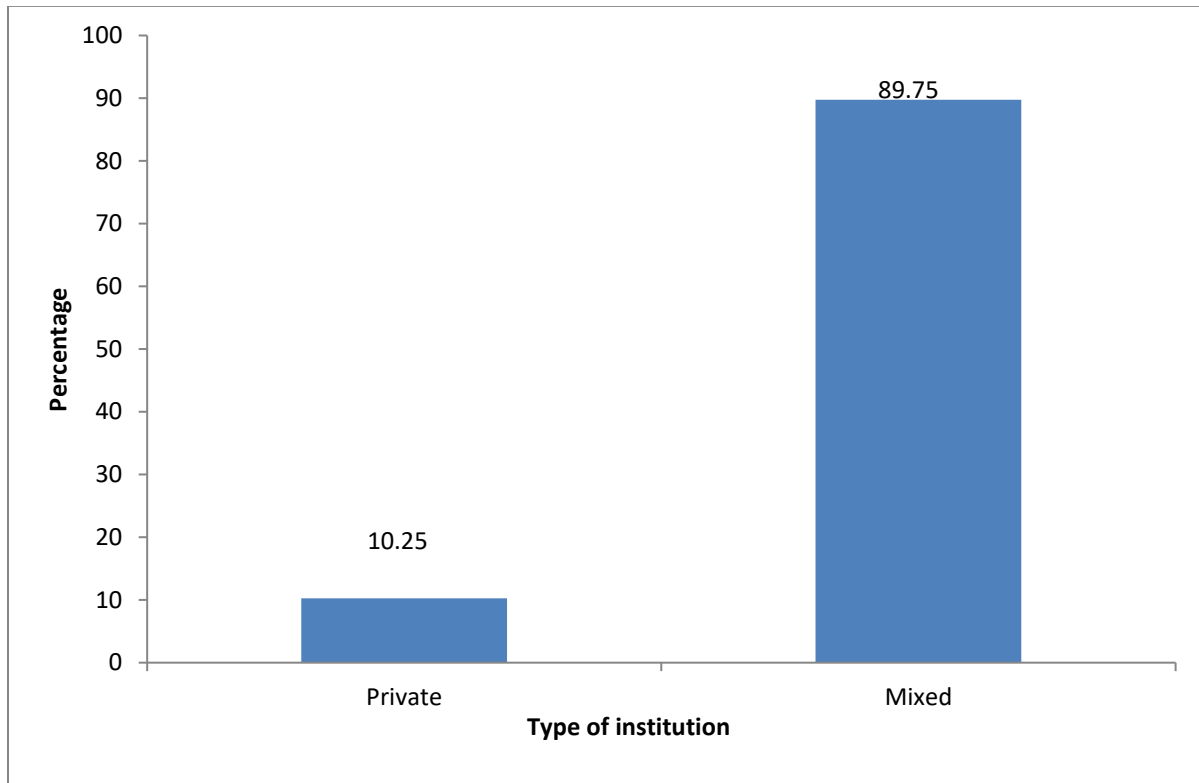
Fig 4.4: Distribution of students in different institution

The study showed that among 400 women, 10.25% of the students were studied in private university and 89.75% of the students were studied in mixed university.

4.5 Marital status of students

16

84

- single
- married
- divorced
- widowed
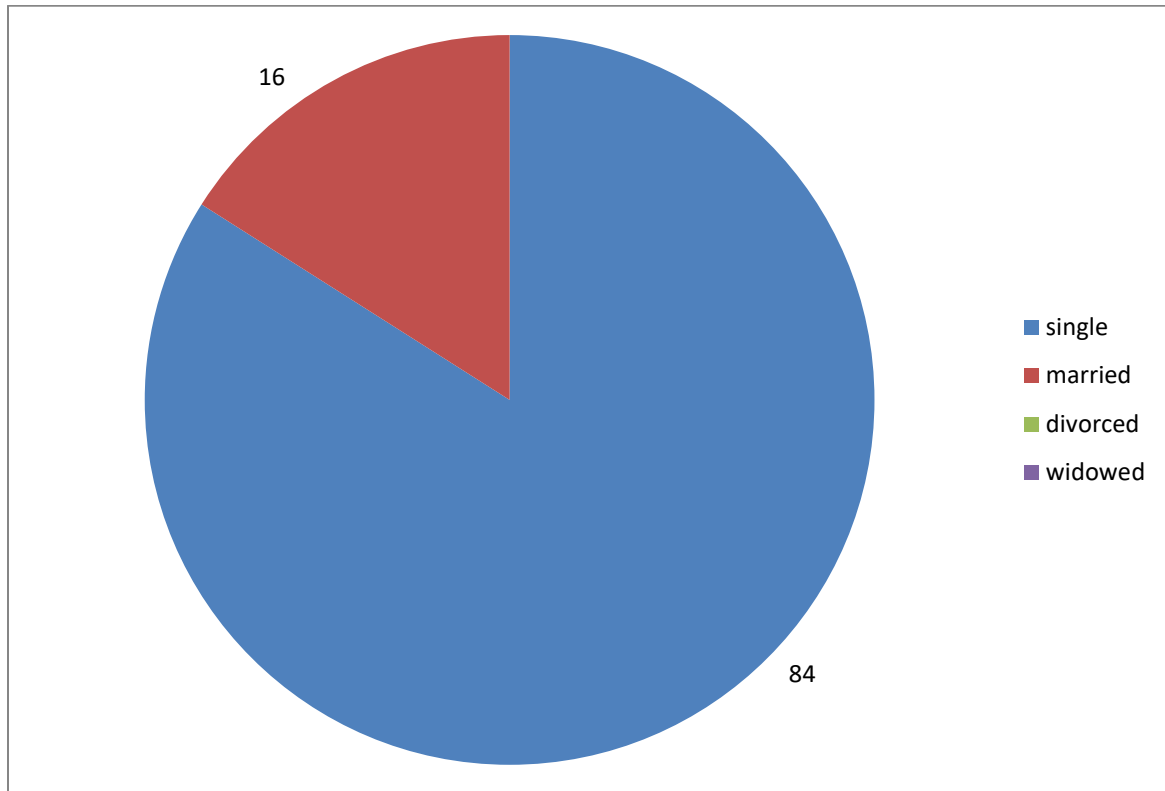
Fig 4.5: Marital status of students

Among 400 students maximum population (about 84%) were single, only few (16%) students were married.

4.6 Distribution of awareness level of students
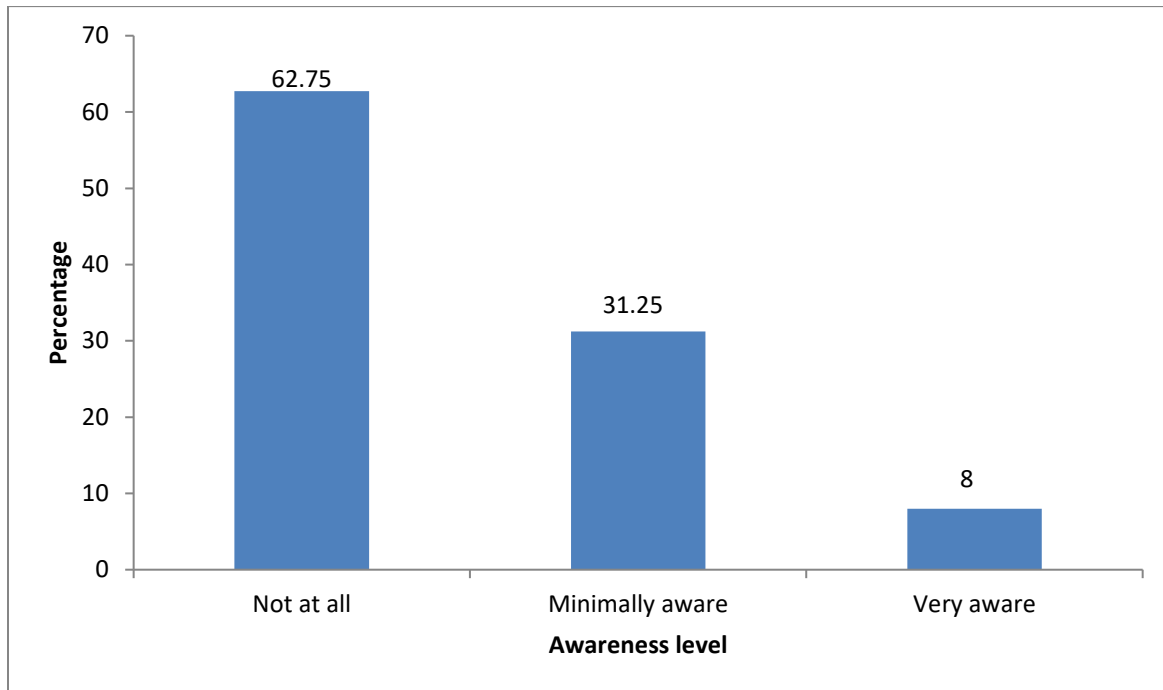
Fig 4.6: Distribution of awareness level of students

Among 400 students, 62.75% of the students were not aware of PCOS, 31.25% of the students were minimally aware and only 8% of the students were very aware about PCOS.

4.7 Perception about PCOS in Population
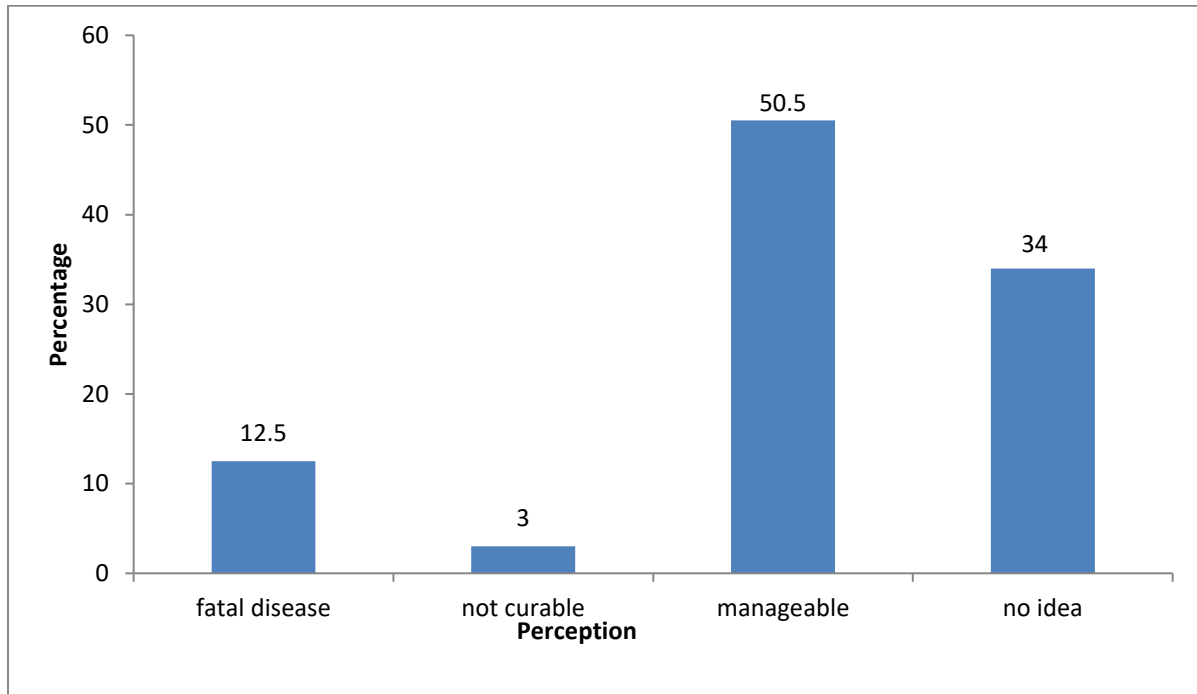
Fig 4.7: Perception about PCOS in Population

Among 400 students, 12.5% of the student thought that PCOS is a fatal disease, 3% of the student thought that PCOS is not curable, 50.5% of the student thought that PCOS is manageable and 34 of the students had no idea about PCOS.

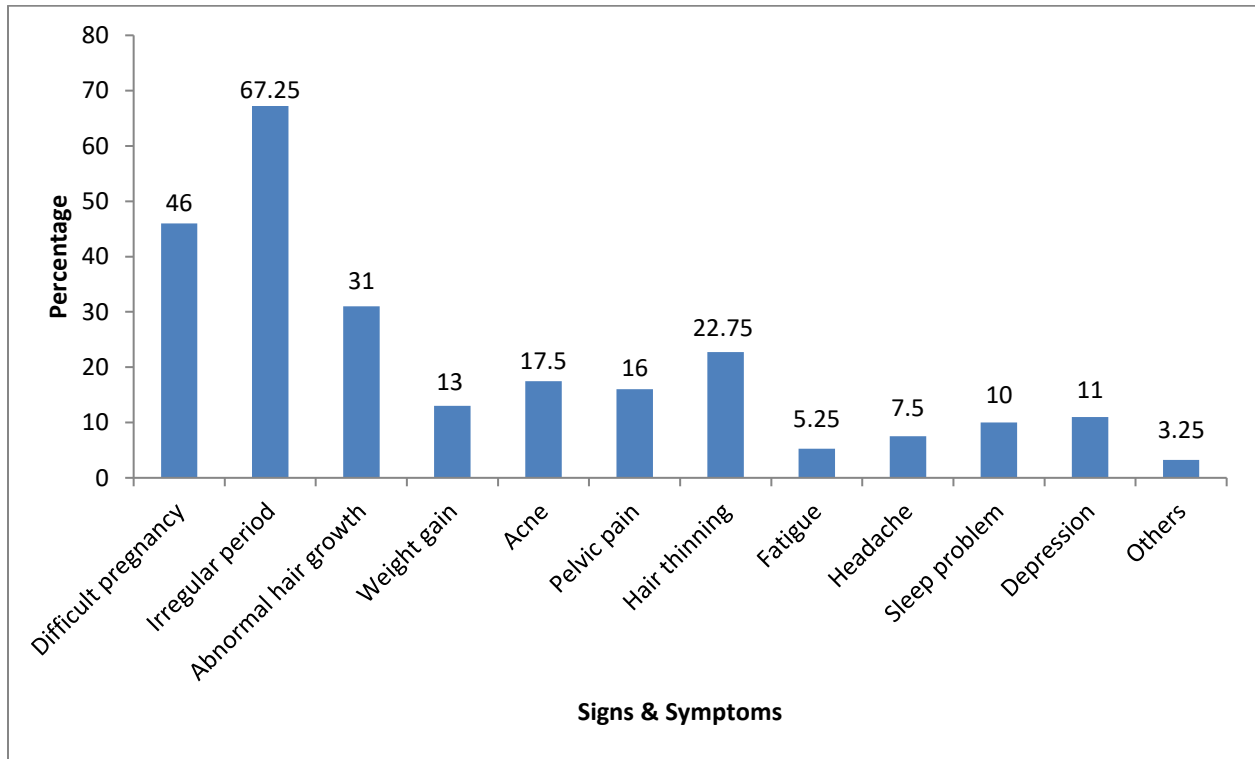## 4.8 Knowledge of signs & symptoms in population

Fig 4.8: Knowledge of signs & symptoms in population

The study showed that among 400 students who were aware of sign & symptoms of PCOS, 46% of students were aware of difficulty in pregnancy, 67.25% of the students were aware of irregular period, 31% of the students were aware of abnormal hair growth, 13% of the students were aware of weight gain, 17.5% of the students were aware of acne, 16% of the students were aware of pelvic pain, 22.75% of the students were aware of hair thinning and 5.25% of the students were aware of fatigue, 7.5% of the students were aware of headache, 10% of the students were aware of sleep problem, 11% of the students were aware of depression and 3.25% mentioned other factors as sign & symptoms of PCOS.

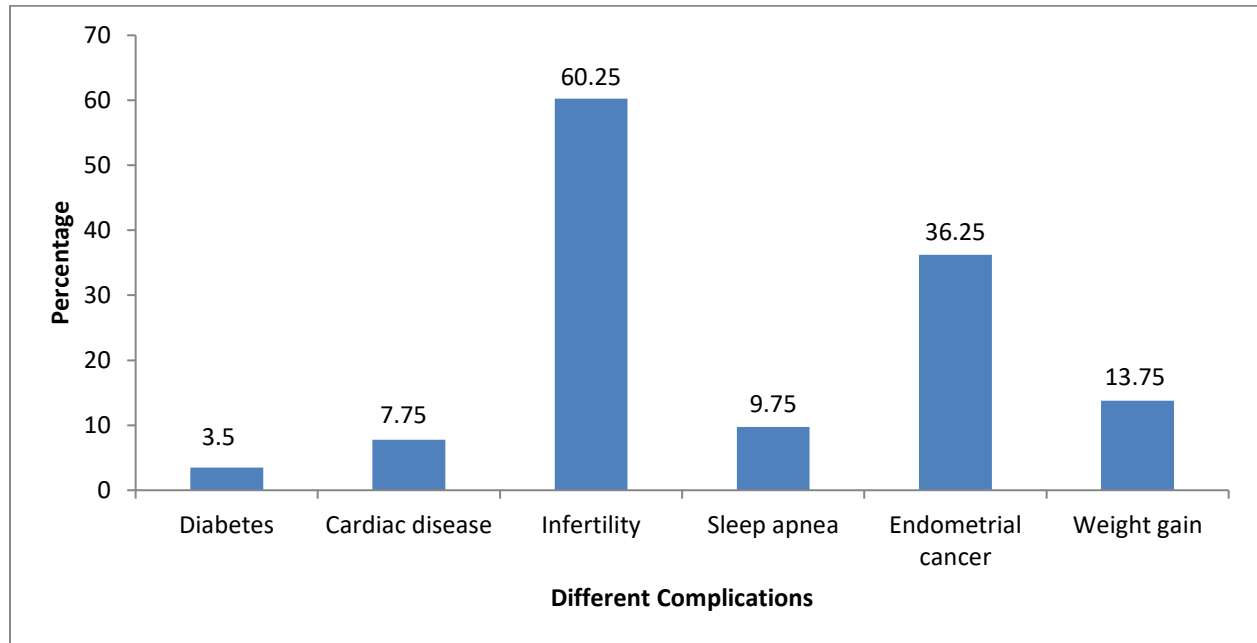## 4.9 Knowledge of complication in population

Fig 4.9: Knowledge of complication in population

The study showed that among 400 students who were aware of the complications of PCOS, 3.5% of the students were aware of diabetes, 7.75% of the students were aware of cardiac disease, 60.25% of the students were aware of infertility, 9.75% of the students were aware of sleep apnea, 36.25% of the students were aware of endometrial cancer and 13.75% of the students were aware of weight gain.

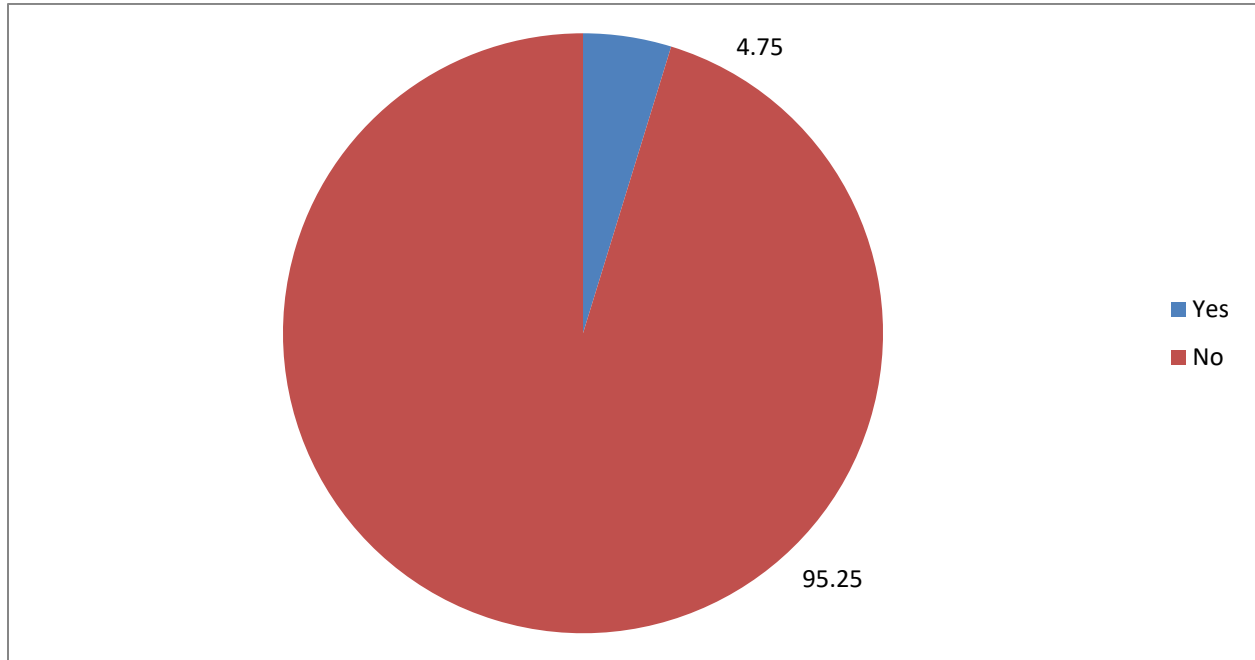## 4.10Prevalence of Diagnosed women in population

Fig 4.10:Prevalence of Diagnosed women in population

Of the respondents, 95.25% of students were never diagnosed with PCOS and only 4.75% of students had been diagnosed PCOS.

4.11 Prevalence of family history in population
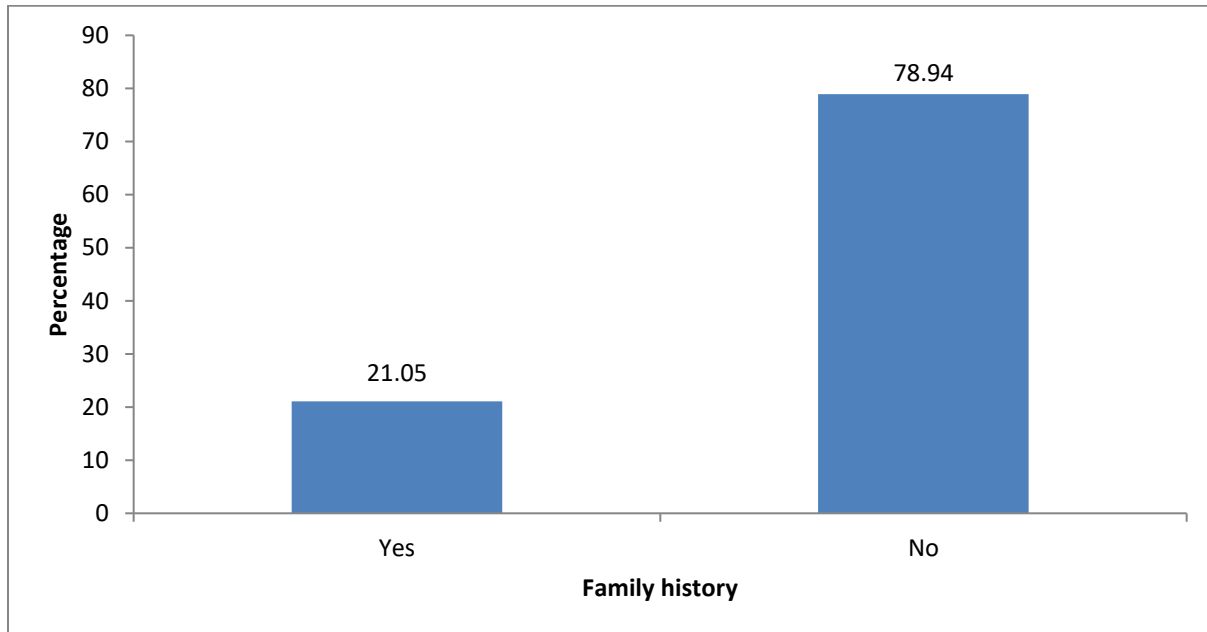

Fig 4.11: Prevalence of family history in population

Among the diagnosed students, only 21.05% of the students had family history about PCOS and 78.94% of the students had no family history about PCOS.

4.12 Distribution of diagnosed method in population
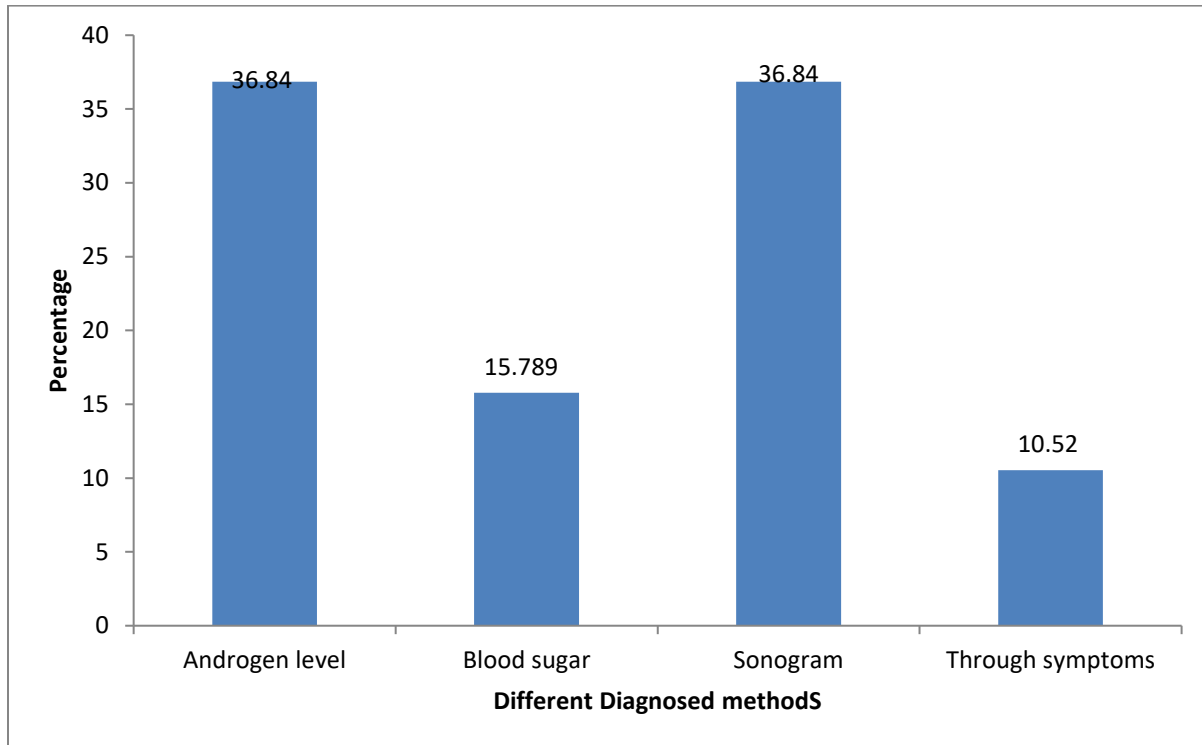

Fig 4.12: Distribution of diagnosed method in population

Among the diagnosed students with PCOS, 36.84% of the students were diagnosed by androgen level, 15% of the students were diagnosed by blood sugar, 36.84% of the students were diagnosed by sonogram and 10.5% of the students were diagnosed through symptoms.

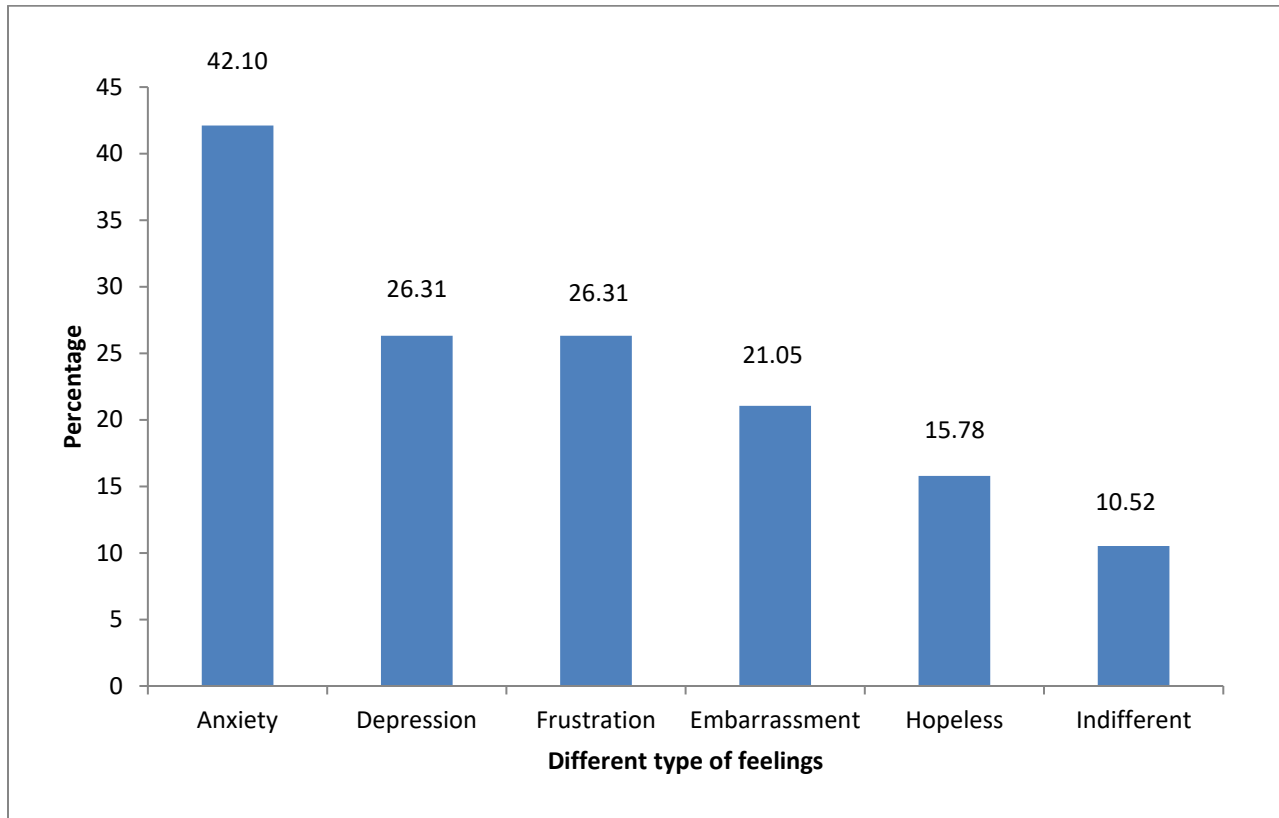## 4.13 Prevalence of feeling about PCOS in population

Fig 4.13: Prevalence of feeling about PCOS in population

Among the diagnosed students, 42.10% of the students felt anxiety, 26.31% of the students felt depression, 26.31% of the students felt frustration, 21.05% of the students felt embarrassment, 15.78% of the students felt hopeless and 10.52 of the students felt indifferent.

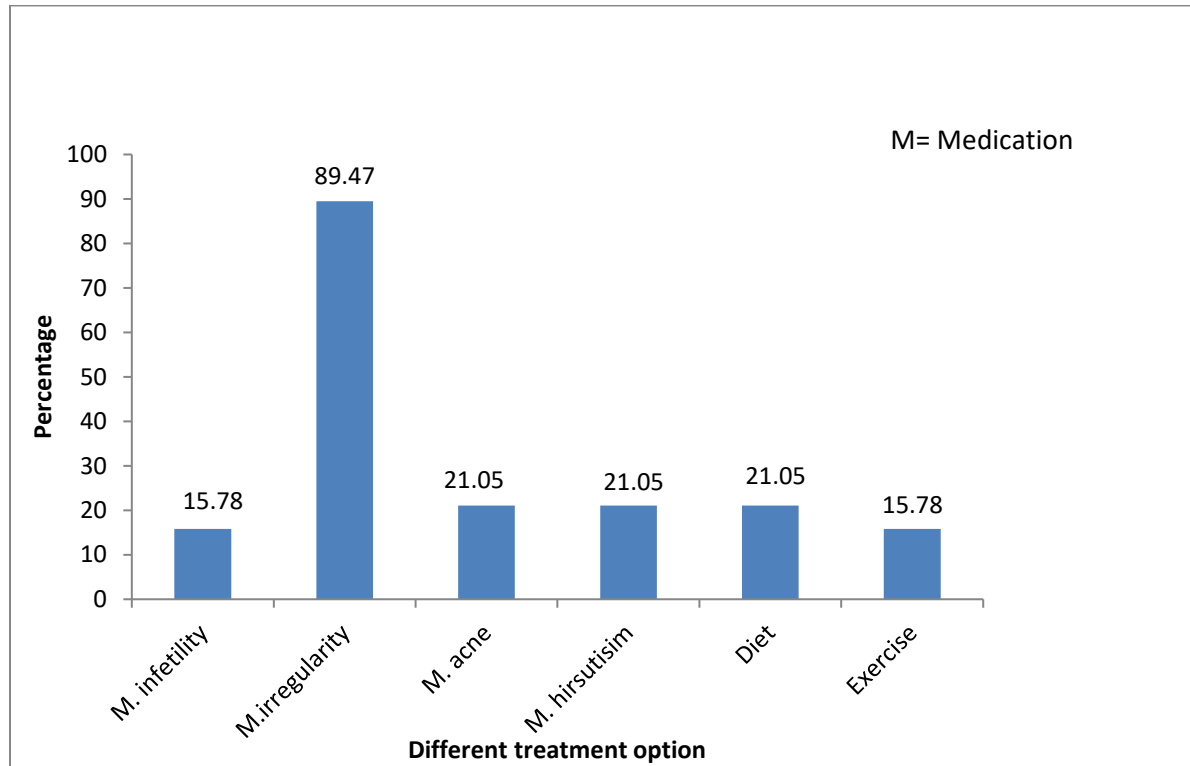## 4.14 Distribution of treatment in population

Fig 4.14: Distribution of treatment in population

Among the diagnosed students 15.78% of the students took medication for infertility, 89.47% of the students took medication for irregularity, 21.05% of the students took medication for acne, 21.05% of the students took medication for hirsutisim,21.05% of the students took healthy diet and 15.78% of the students were performed exercise.

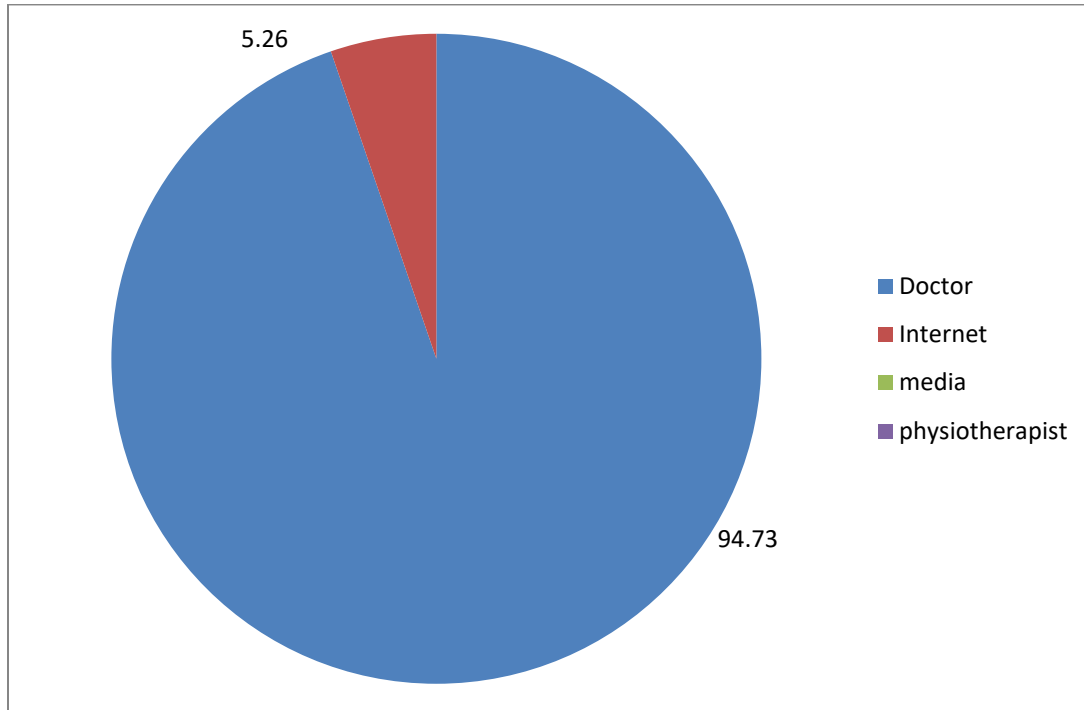## 4.15 Distribution of source of information

Fig 4.14: Distribution of treatment in population

Among the study population, 94.73% said that they were informed about PCOS from doctors and only 5.26% said that they were informed about PCOS from internet.
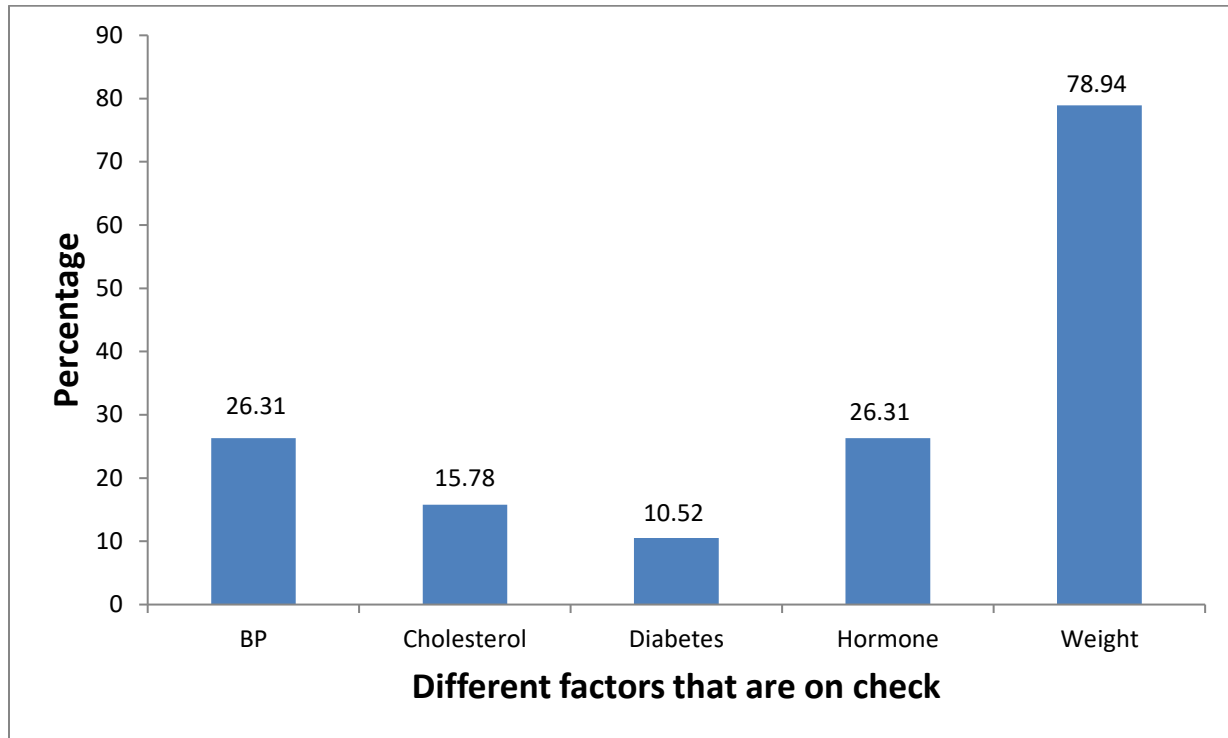
4.16 Prevalence of factors on check-up

Fig 4.16: Prevalence of factors on check-up

Among the diagnosed students, 26.31% of the students were checked their BP, 15.78% of the students were checked their cholesterol, 10.52% of the students were checked their diabetes, 26.31% of the students were checked their hormone balance and 78.94% of the students were checked their weight regularly.
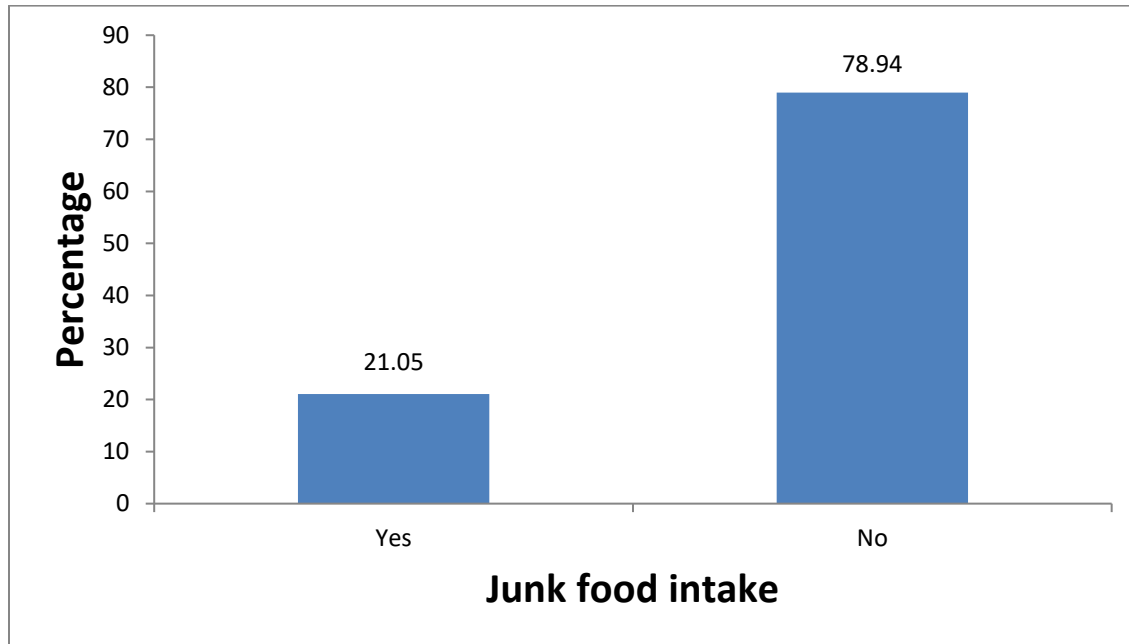
4.17 Junk food intake in population

Fig 4.16: Prevalence of factors on check-up

Among the students who had PCOS, 21.05% of the students consumed junk food excessively and 78.94% of the students did not intake junk food excessively.

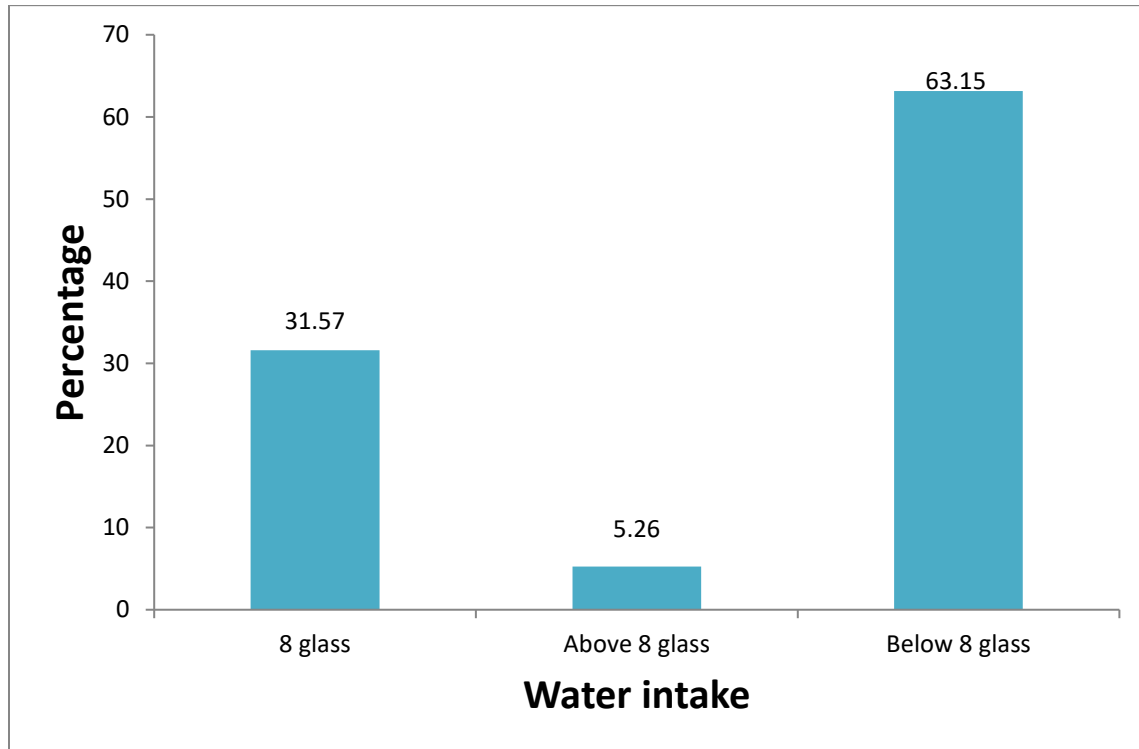## 4.18 Prevalence of water intake in population

Fig 4.18: Prevalence of water intake in population

Among the students who had PCOS, 31.57% of the students drank 8 glasses of water, 5.26% of the students drank above 8 glasses of water and 63.15% of the students drank below 8 glasses of water.

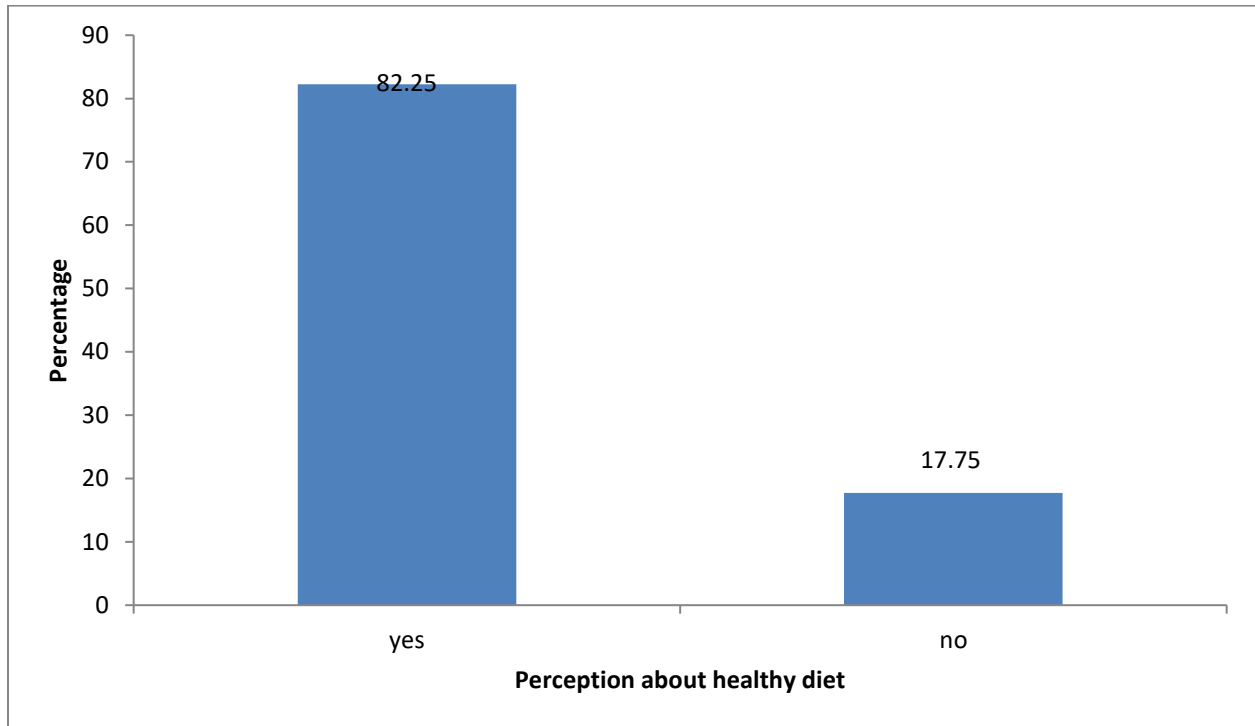## 4.19 Knowledge about healthy diet for managing PCOS

Fig 4.19: Knowledge about healthy diet for managing PCOS

The study showed that among 400 students, 82.25% of the students thought that a healthy diet could manage PCOS and only 17.75% of the students thought that a healthy diet could not manage PCOS.

4.20 Knowledge about food that should be avoided in PCOS
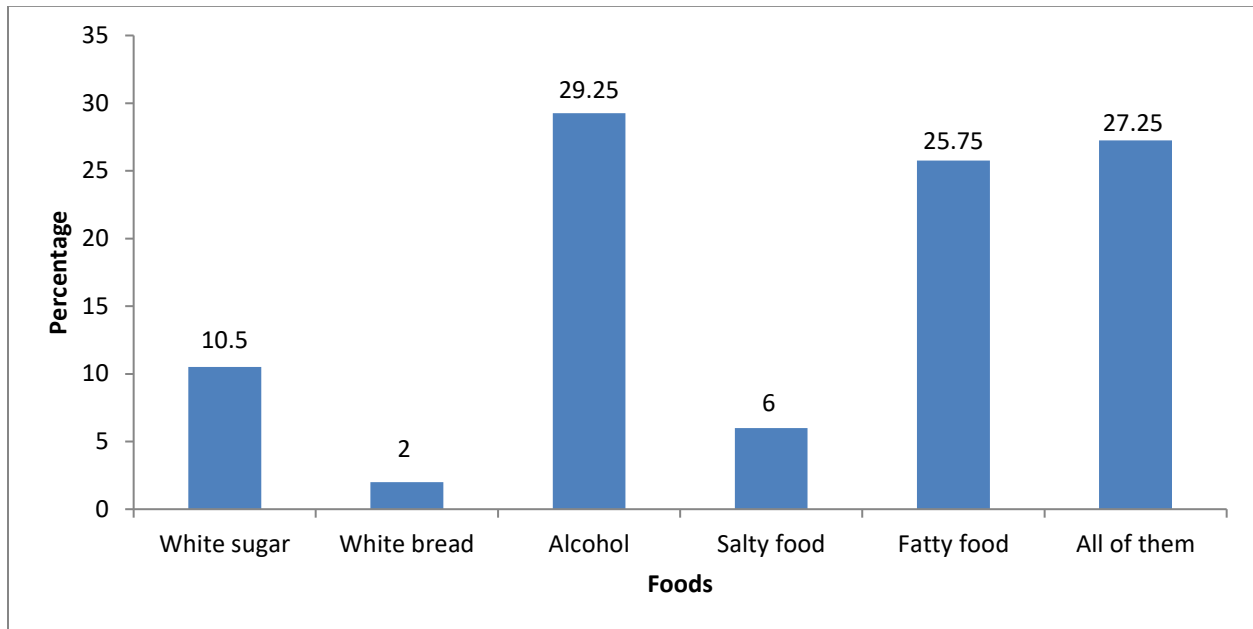
Fig 4.20: Knowledge about food that should be avoided in PCOS

Among 400 students, maximum 29.25% of the student thought alcohol should be avoided followed by 27.25% of population who thought all the unhealthy food should be avoided. Only 2% 0f the population and 6% of the population believed that white bread and salty food should be avoided respectively.

4.21 Perception about exercise for prevention of PCOS

Fig 4.21: Perception about exercise for prevention of PCOS

The study showed that among 400 students, only 36.75% of the students thought that exercise could help in prevention of PCOS and most of the students around 63.25% of the students thought that exercise could not help in prevention of PCOS.

4.22 Knowledge about the benefit of exercise regarding PCOS in population
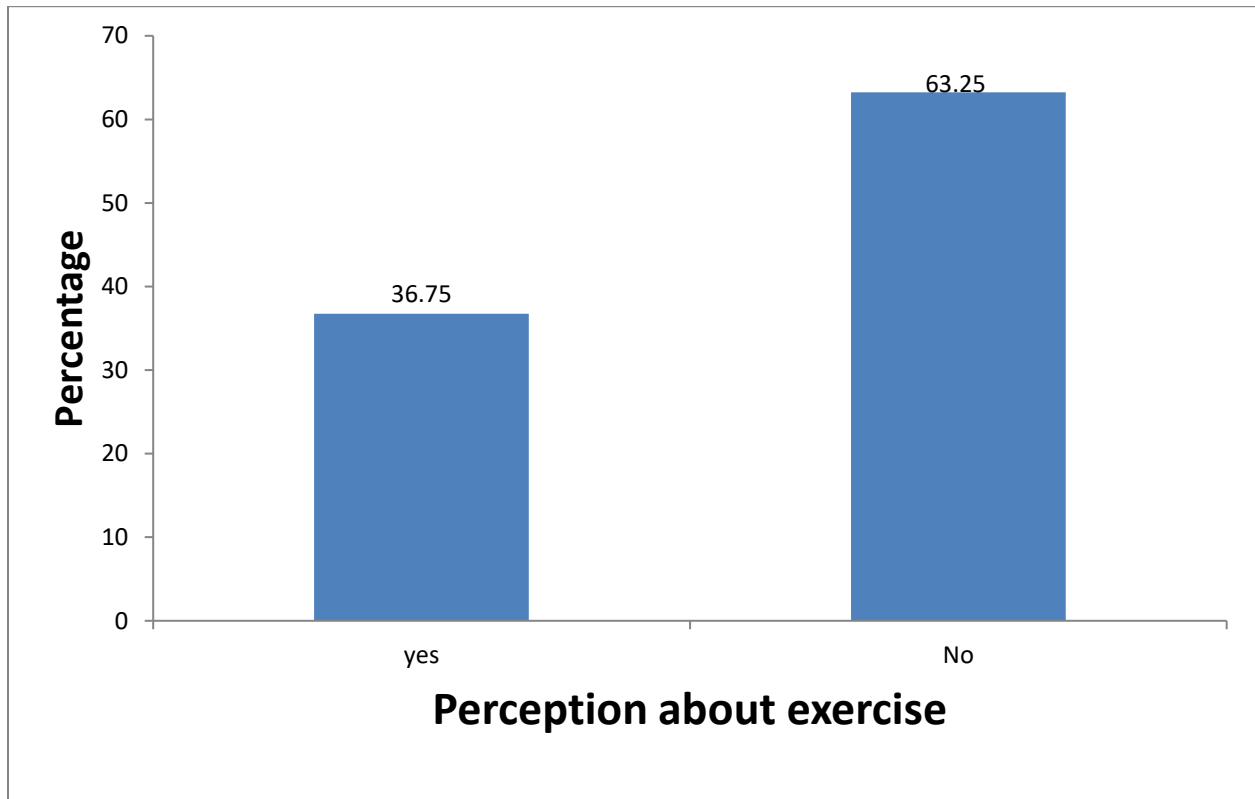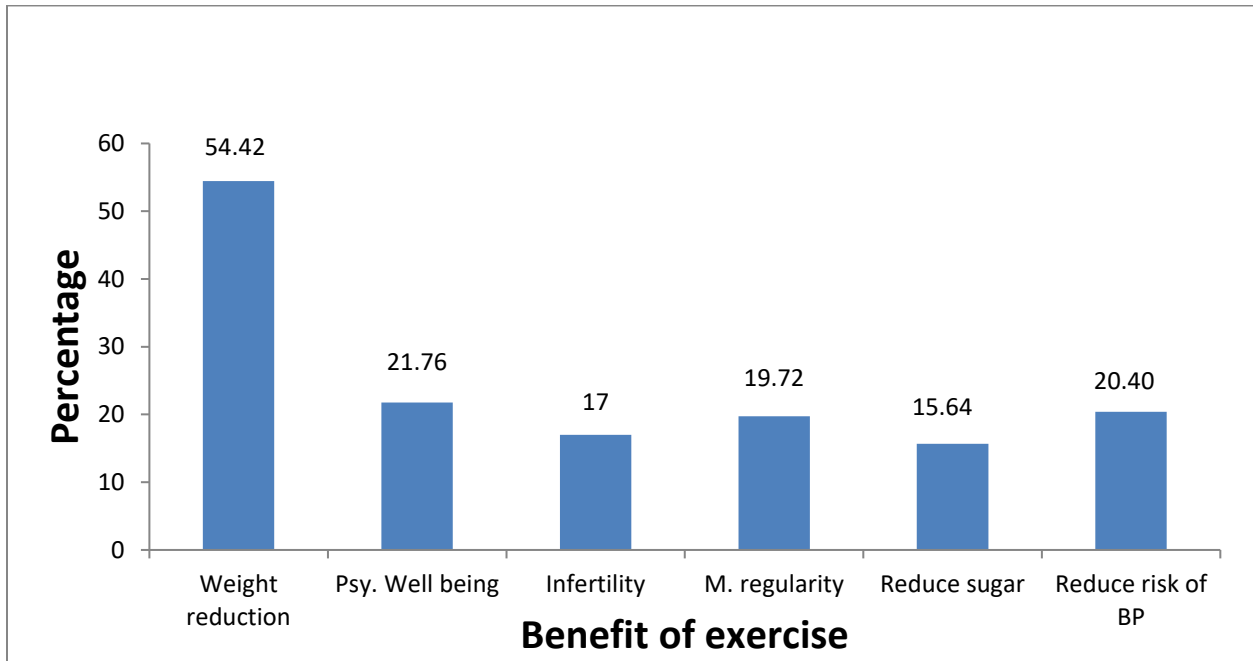

Fig 4.22: Knowledge about the benefit of exercise regarding PCOS in population

Among the students who thought that exercise could help in prevention of exercise, 54.42% of the students thought exercise could help in weight reduction, 21.76% of the students thought exercise could help in psychological wellbeing, 17% of the students thought that exercise could help in infertility, 19.72% of the students thought exercise could help in menstrual regularity, 15.64% of the students thought that exercise could help in reduction of diabetes and 20.40% of the students thought exercise could help in reduce BP.

4.23 Prevalence of refraining factors from doing exercise
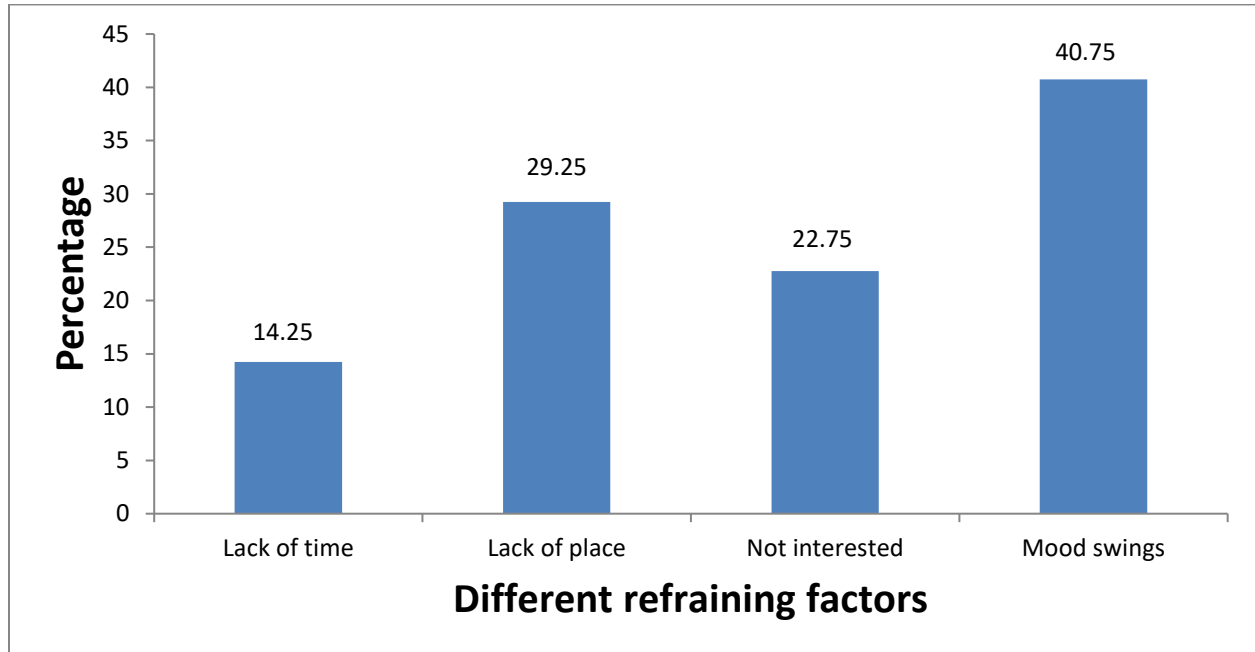
Fig 4.23: Prevalence of refraining factors from doing exercise

The study showed that 14.25% of the students did not do exercise for lack of time, 29.25% of the students did not do exercise for lack of place, 22.75% of the students did not do exercise as they were not interested in doing exercise and 40.75% of the students did not do exercise for their mood swing problems.

4.24 Knowledge about the treatment options PCOS
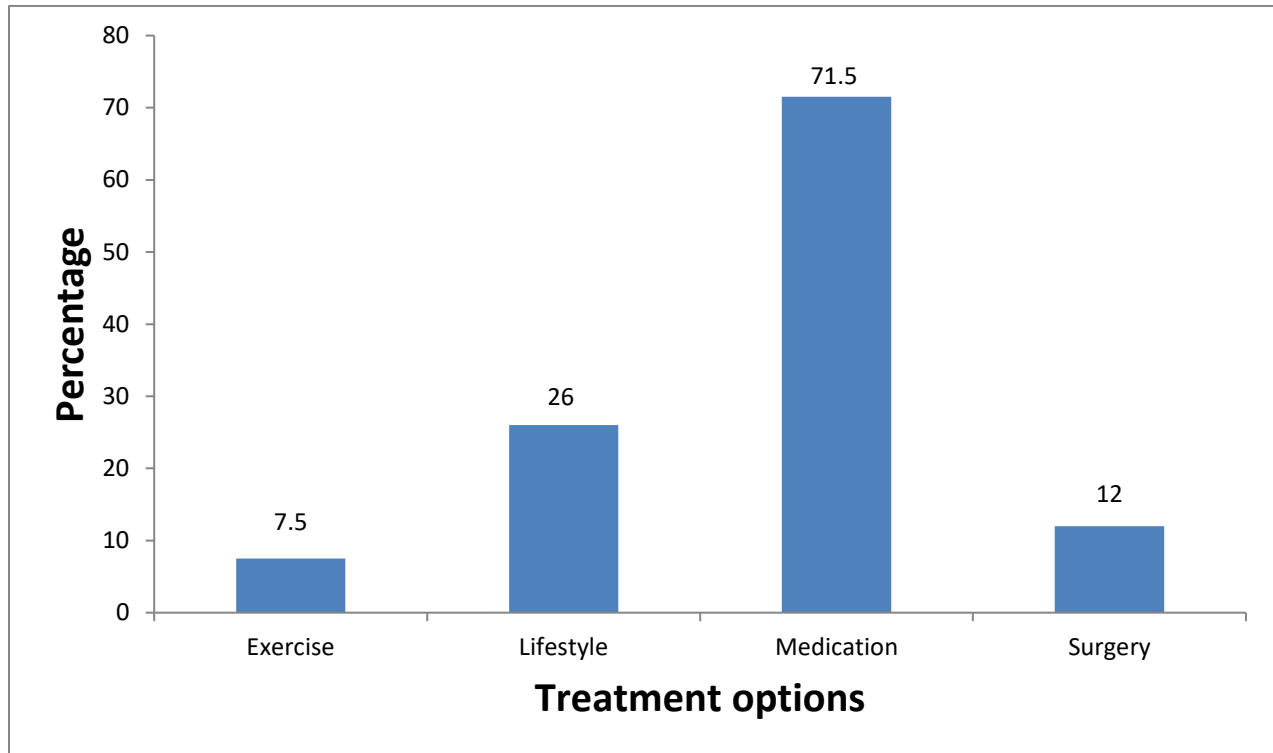
Fig 4.24: Knowledge about the treatment options PCOS

Among the respondents, 7.5% of the students believed that PCOS can be treated by doing exercise, 26% believed that by changing lifestyle PCOS can be managed, 12% believed that by doing surgery is a treatment option and majority around 71.5% of the students mentioned that PCOS can be treated by medication.

Chapter-5

Discussion & Conclusion

5.1 Discussion

Polycystic Ovary Syndrome, or PCOS, is a health condition that affects about 10 million women in the world. At present worldwide different studies have been done on PCOS based on knowledge and awareness.

In this study 400 university students were analyzed regarding the knowledge and awareness of PCOS. Women were aged between 19-20 years (33.25%), 21-22 years (46.5%), 23-24 years (16.75%) and 25-26 years (3.5%). Most of the students were Muslims, approximately 96% and only 4% were Hindu. Among all the students, 25.75% of them studied in political science department, 29.5% of them studied in social work department, 14% of the students studied in mathematics department, 7.5% of the students studied in Bangla department, 13% of the students studied in English department and 10.25% of the students studied in pharmacy department. Since majority did not hear about PCOS, a small briefing was given.

Among the 400 students, 31.25% students were with minimum level of awareness and 8% students were very aware about PCOS. On the other hand a study conducted in Mangalore on 150 nursing student at NitteUsha Institute of Nursing Sciences (NUINS) showed that 76% hadaverage knowledge and 10.7% had good knowledge regarding polycystic ovarian syndromes results, inconsistent with our study (Sunanda B. &Nayak, 2016). However, we have to remember that the response was subjective in our study and awareness was not completely accurate as a small briefing was given to those completely unaware.

We found that 8% were very aware about PCOS, 94.73% students reported as doctor as their main source of information about PCOS, 50.5% reported that PCOS is manageable, 36.75% aware that exercise helps in the management of PCOS, 20% of the students thought exercise could help in weight reduction, 7.25% of the students thought exercise could help in menstrual regularity. On the other hand a study was conducted in India among 100 women who was diagnosed as PCOS by a gynecologist and reproductive age group between 18-35 years were only included in this study. Here they found that 21% of the respondents are very well aware about PCOS, 51% reported as doctor was their main source of information about PCOS, 81% expressed that PCOS is manageable one. 62% aware that exercise helps in the management of

PCOS, 42% believed that exercise helps in weight reduction, 26% thought exercise helps in menstrual irregularity. (Pitchai et al, 2016)

In our study among the diagnosed students, 42.10% of the students felt anxiety and 26.31% of the students felt depression where as in another study, in distribution of emotional feelings towards PCOS; anxiety was placed on top followed by depression which was experienced by 32% and 19% respectively. (Pitchai et al, 2016)

We found that 4.75% students were diagnosed with PCOS. On the other hand, a study performed in India among the girl students of Bishop Heber Collegethat showed that 7.14% of surveyed girls had PCOS. However the diagnosis was self-reported in our survey whereas in the latter, the diagnosis was done by asking questions to each individual. (Nivetha&Suganya, 2016)

We also found that maximum 40.75% of the students did not do exercise for their mood swings problem and only 14.25% of the students did not do exercise for lack of time. In another study which was conducted in India among 100 women who was diagnosed as PCOS showed that 33% females did not do exercise for lack of time and only 17% females did not do exercise for their mood swings problems. (Pitchai et al, 2016)

In our study, only 7.5% of the students believed that PCOS can be prevented by doing exercise and majority, around 71.5% of the students mentioned that it can be treated by taking medication. In another study, 20% of the students believed that it can be prevented by doing exercise and majority around 45% of the students mentioned that it can be treated by taking medication (Pitchai et al, 2016).

In our study, majority around 67.25% of the student thought that irregular period was the sign and symptom of PCOS and only 31% of the students thought that abnormal hair growth was the sign and symptom of PCOS. This is similar in to the study in India where majority around 30% of the student thought that irregular period was the sign and symptom of PCOS and only 8% of the students thought that abnormal hair growth was the sign and symptom of PCOS (Pitchai et al, 2016).

Polycystic ovarian syndrome is the most common hormone abnormality of reproductive aged women. PCOS is more prevalent among family members than in general population. So, in

future steps should be taken accordingly to make women more willing by rising awareness programs.

5.2 Conclusions

This study concludes that the level of awareness about PCOS is insufficient; we consider it is necessary to improve awareness level about PCOS. Efforts need to be given to intensify awareness in the general public about PCOS and develop a strategy to reach to the lower socioeconomic strata. The best treatment option varies among individuals, and the effectiveness of each treatment can vary according to an individual's condition. The research on all of the aspects of PCOS will inform the public about how PCOS can affect them and their loved ones. So, from this study every woman gathered a little knowledge about PCOS and may be able to protect themselves from problems that are associated with PCOS.

Sample of Questionnaire

KNOWLEDGE AND AWARENESS OF POLY CYSTIC OVARIAN SYNDROME AMONG UNIVERSITY STUDENTS IN NARAYANGONJ

(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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