# Cross-sectional study to assess the knowledge, attitude, and behavior of women suffering from PCOS and their effect on the skin

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## ABSTRACT

*Polycystic ovarian syndrome, or PCOS, was known initially as "Stein-Leventhal syndrome" but it was later referred to as "polycystic ovary disease" (PCOD) before being referred to as PCOS—heterogeneous endocrine and metabolic disorders, which has a significant impact on the lives of women of childbearing. Ovarian cysts and hyperandrogenism are the features of PCOS. PCOS causes oligo menorrhea/amenorrhea, infertility/early miscarriage, and their major effect on the skin include hirsutism, acne, androgenetic alopecia, and acanthosis nigricans, among other unpleasant symptoms. The study was cross-sectional type conducted for a period of 3 months n Shadan Medical College, Hyderabad. After ethical committee clearance was obtained to commence the study. Women of reproductive age were included in the study. Participants visiting OPD were required to fill out the questionnaire after collecting data analysis was carried out. It can be concluded from the study majority of the participants were in the age group of 18- 25 had intermediate education and were found to be married housewives as their occupation majority of the participants had a history of diabetes. Only 46.77% of the participants had knowledge ledge about PCOS .29.55% had a favorable attitude and practice toward PCOS 48.84 % of the participants had knowledge about PCOS and its major effect on the skin. The majority of the participants experienced acne and hirsutism. 39.33% suffered from seborrhea dermatitis which patients experienced on eyebrows and ears, hence effective pharmacist counseling needs to be implemented.*

**Keywords:** PCOS, acne, hair loss and effect on skin.

## Introduction

Polycystic ovarian syndrome, or PCOS, was known initially as "Stein-Leventhal syndrome," but it was later referred to as "polycystic ovary disease" (PCOD) before being referred to as PCOS. Ovarian cysts, oligo- or anovulation, and hyperandrogenism are the hallmarks of this heterogeneous endocrine and metabolic disorder, which has a significant impact on the lives of women of childbearing age [1-2]. Although the exact cause of PCOS is still unknown, researchers believe that the condition is primarily linked to insulin resistance, hyperandrogenism, and hyperinsulinemia. These two elevated hormones both affect how the ovary works and affect how other hormones that control menstruation work normally. A steady hormonal unevenness in the body weakens the working of the ovaries, prompting the development of growths inside the ovarian sac. This is the origin of the term "polycystic ovary syndrome" [3]. Stress, obesity, genetics, lifestyle, and prenatal factors are additional factors that influence PCOS to varying degrees. PCOS is frequently characterized by hyperandrogenism and hyperinsulinemia, both of which contribute to a variety of intricate body dysfunctional mechanisms. PCOS causes oligomenorrhea/amenorrhea, infertility/early miscarriage,

and their major effect on the skin include hirsutism, acne, androgenetic alopecia, and acanthosis nigricans, among other unpleasant symptoms. For the finding of PCOS, the Rotterdam Rules are broadly utilized around the world, and its utilization is suggested by the Endocrine Society in 2013, the American Foundation of Family Doctors (AAFP) Rules in 2016, and the Global Proof-based Rule for the appraisal and the executives of polycystic ovary disorder 2018 [4]. For PCOS to be diagnosed, women must meet at least two of the three criteria, including oligo-/anovulation, clinical or biochemical hyperandrogenism, and/or ovarian cysts. Other conceivable hormonal problems ought to likewise be prohibited [5]. It meets the symptomatic prerequisites set by the Places for Infectious Prevention and Counteraction (CDC). A comprehensive evaluation of the patient's medical history, physical examination, basic laboratory tests, and comorbidity risk assessment is recommended without ultrasound and other types of imaging tests for the diagnosis of PCOS in addition to using the Rotterdam criteria [6]. Reproductive difficulties include infertility, late menopause, and even endometrial cancer can result from PCOS. Due to the presence of risk factors like central obesity, high blood pressure, atherosclerotic dyslipidemia, and

insulin resistance, women with PCOS are also more likely to develop metabolic syndrome [7]. Women with PCOS frequently experience long-term consequences like type 2 diabetes, heart disease, sleep apnea, and psychological issues like anxiety and depression. As a result, early PCOS diagnosis and treatment are essential for reducing healthcare costs and preventing long-term complications.

## Treatment
PCOS treatment should be tailored to each patient based on their clinical presentations, and it should aim to achieve the desire to conceive. Infertility or anovulation can be treated with first-line medications like clomiphene or letrozole or second-line medications like metformin if a pregnancy is desired, as stated in the American Family Physician (AAFP) Guideline 2016 and the Australian Family Physician (AFP) Guideline 2012, respectively. In vitro preparation (IVF) is one of the normal medicines for ladies with PCOS however presents different difficulties going from a poor to a misrepresented reaction, unfortunate egg-to-follicle proportion, unfortunate treatment, unfortunate blastocyst change, and ovarian hyper stimulation condition. Hormonal contraceptives like oral contraceptives or hormonal intrauterine devices (IUDs) should be the first line of treatment for ovulatory dysfunction if no pregnancy is desired. Metformin should be the second line of treatment. Patients can be recommended skin cream, benzoyl peroxide for skin inflammation, electrolysis and phototherapy for hirsutism, metformin for insulin obstruction, and way-of-life adjustments for stoutness to defeat the particular condition they are confronting. Between 2.2 and 48% of women worldwide suffer from PCOS [8-9]. Since the latter part of the 1900s, studies have demonstrated a trend toward an increasing prevalence of PCOS. 12.6% of employees in various parts of the world had PCOS, according to a prevalence study. Numerous nations have conducted research on health-related practices, knowledge, and prevalence. As a result, the goal of this study was to find out how women knew, felt, and behaved about PCOS. Healthcare professionals are the most common source of information that helps patients become more aware of it [10-12].

## Material and Methods
The study was cross-sectional and conducted for a period of 3 months at Shadan Medical College, Hyderabad. After ethical committee clearance was obtained to commence the study. Women of reproductive age were included in the study.

## Study Design
Questionnaire-based research with a set of validated questions covering knowledge, attitude, and behavior. A pilot study and prior references on this domain were used to validate the questions. Questionnaires were reviewed by the panel of gynecologists, dermatologists, and pharmacists.

**Type of study:** Observation cross sectional study.

**Inclusion criteria:**
1) Women with age 18-45 age
2) Patient who can understand the questionnaire

**Exclusion criteria:**
1) Women age less than 18
2) Women age greater than 45

**Sample size: 300**

**Sampling method**
Patients visiting outpatients department of Obstetrics and Gynecology and Dermatology at Shadan Medical College Hyderabad were allowed to fill the questionnaire.

**Data analysis plan**
First section: consist of the presenting patient's socio-demographic profile and characteristics included age, education profile, marital status, presenting patient medical history such as diabetes, hypertension, and so on.

**Second section**
To assess the knowledge, attitude, and behavior of the presenting cases regarding Polycystic Ovary Syndrome using a questionnaire format.

**Third section**
Consist of patients experiencing major effects on the skin like acne, hirsutism, and seborrheic dermatitis.
Questionnaires were framed and reviewed by the panel of pharmacist, gynecologist, and dermatologist. To avoid bias, the questions were kept straightforward, easy to understand, and free of leading questions. Before the participants were given the questionnaires, the aims and objectives were explained to them in the language they understood. It was made sure that the questionnaire's language was changed to accommodate different understandings.

In order to prevent bias based on voluntary participation, participants were assured that participation in the study was entirely voluntary. The analysis of the results was done using Microsoft Excel, the data were analyzed using descriptive statistics, frequency and percentages, and the result was presented using tables.

## Results
Out of 300 participants, 47.67% were in the age group of 18-25 .30.3% were in the age group of 26- 35 and 21.33 were in the age group 36-45. 8.33% were having SSC education qualification .41.33% were having intermediate qualifications. 19% were graduate, 14% were post-graduate 17.33 % were illiterate 41.67% were single. 58% were married. 26.33% were students, 29.67% were housewives, and 23.67 % were working women .23% were in other categories. 29.67% were having a history of diabetes. 21.33 were having a history of hypothyroidism, 14% of the participants were having a history of contraceptive use
19.33% were having a history of hypertension, and 14.67 % were not having any co-morbidity.

**Demographics of the patients**

**Table 1**

| S. No | Age in years | Number (n) | Percentage (%) |
|-------|--------------|------------|----------------|
| 1 | 18-25 | 143 | 47.67 |
| 2 | 26-35 | 91 | 30.3 |
| 3 | 36-45 | 64 | 21.33 |
| | Total | 100 | 100 |
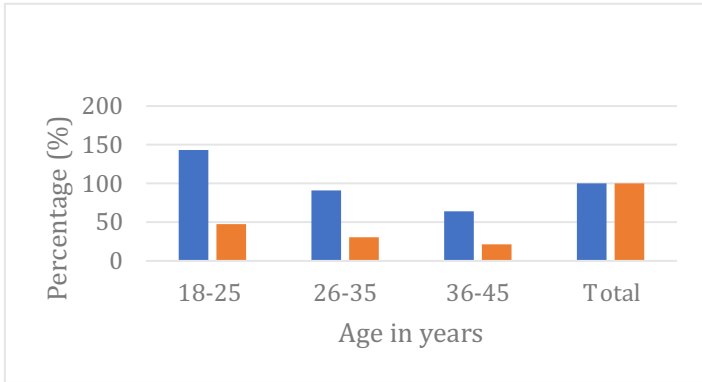
**Fig 1**

**Table 2**

| S. No | Education | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Ssc | 25 | 8.33 |
| 2 | Intermediate | 124 | 41.33 |
| 3 | graduation | 57 | 19 |
| 4 | Post-Graduation | 42 | 14 |
| 5 | Illiterate | 52 | 17.33 |
| | Total | 100 | 100.00 |
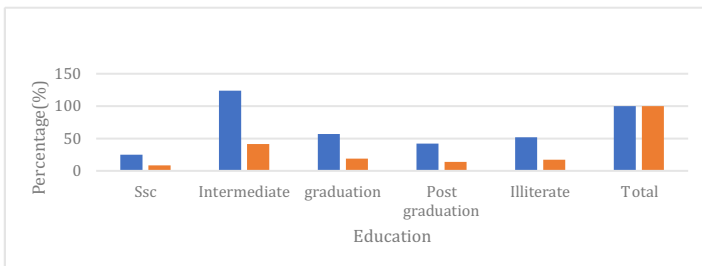


**Fig 2**

**Table 3**

| S. No | Marital status | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Single | 125 | 41.67 |
| 2 | Married | 174 | 58 |
| | Total | 100 | 100 |

**Table 4**

| S. No | Occupation | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Student | 79 | 26.33 |
| 2 | Housewives | 89 | 29.67 |
| 3 | Working | 71 | 23.67 |
| 4 | Others | 69 | 23 |
| | Total | 100 | 100.00 |
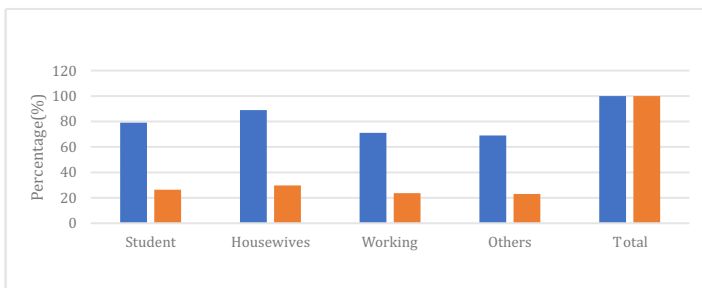


**Fig 3**

**Table 5**

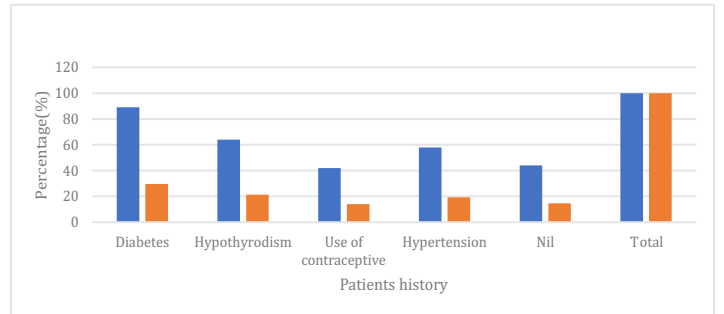| S. No | Patient History | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Diabetes | 89 | 29.67 |
| 2 | Hypothyroidism | 64 | 21.33 |
| 3 | Use of contraceptive | 42 | 14 |
| 4 | Hypertension | 58 | 19.33 |
| 5 | Nil | 44 | 14.67 |
| | Total | 100 | 100 |



**Fig 4**

### Knowledge of the participants towards PCOS

19.67% heard about PCOS 80% didn't heard about PCOS 30.33% reported absences of periods as PCOS.12.33% as presences of longer periods 57.33% doesn't know about pcos.11% of the participants reported genetic as the reason for pcos.13% of the participants reported as weight gain.23.67% reported as hormonal imbalance.12.33% reported all the above as the reason for pcos.40% reported as I don't know. 15.33% reported acne as symptoms of PCOS, 21.33% as hair loss, 11% as rashes16% all of the above symptoms.36.67% do not know the symptoms of PCOS. 23.67% of the participants answered that PCOS can be diagnosed based on symptoms16.67% from hormone tests 11.7% diagnosed from ultrasound. 9.67% of the above listed 38% participants do not know how to diagnose pcos.11.33% reported medication as treatment option available 21.67% as ovarian cystectomy. 23.3% as weight management.8.67% reported as all above the above 35% do not know the treatment options.
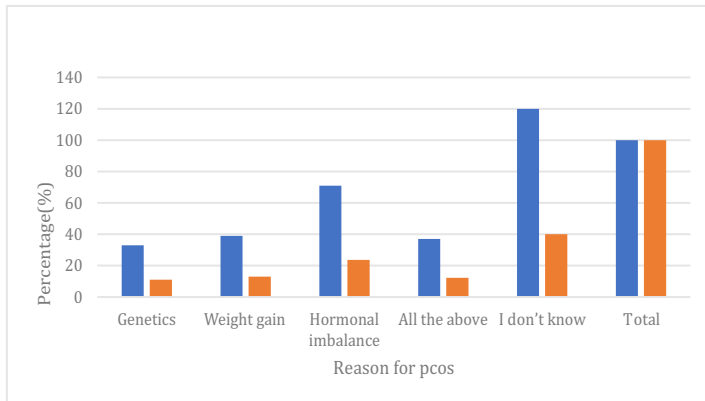
### Table no 6.1 Did u hear about PCOS

| S. No | Answer option | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Yes | 59 | 19.67 |
| 2 | NO | 240 | 80 |
| | Total | 100 | 100 |

### Table no 6.2 what is PCOS

| S. No | Answer option | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Absence of periods | 91 | 30.33 |
| 2 | Presence of longer periods | 37 | 12.333 |
| 3 | I don't know | 172 | 57.33 |
| | Total | 100 | 100 |

## Table no 6.3 What are the reason for PCOS

| S. No | Answer option | Number (n) | Percentage (%) |
|---|---|---|---|
| 1 | Genetics | 33 | 11 |
| 2 | Weight gain | 39 | 13 |
| 3 | Hormonal imbalance | 71 | 23.67 |
| 4 | All the above | 37 | 12.33 |
| 5 | I don't know | 120 | 40 |
| | Total | 100 | 100 |

| S. No | Answer option | Number (n) | Percentage (%) |
|---|---|---|---|
| 1 | Medication | 34 | 11.33 |
| 2 | Ovarian cystectomy | 65 | 21.67 |
| 3 | Weight management | 70 | 23.3 |
| 4 | All the above | 26 | 8.67 |
| 5 | I don't know | 105 | 35.00 |
| | Total | 100 | 100 |



**Fig 5**

## Table no 6.4 what are the symptoms of PCOS

| S. No | Answer option | Number (n) | Percentage (%) |
|---|---|---|---|
| 1 | Acne | 46 | 15.33 |
| 2 | Hair loss | 64 | 21.33 |
| 3 | Rashes | 33 | 11 |
| 4 | All the above | 48 | 16 |
| 5 | I don't know | 110 | 36.67 |
| | Total | 100 | 100.00 |
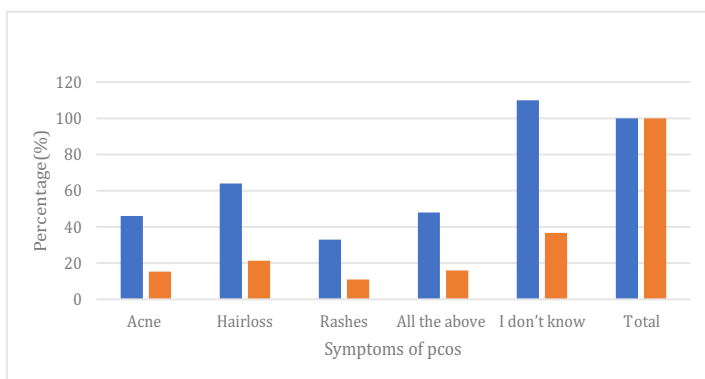


**Fig 6**

## Table 6.5 how do you diagnose pcos

| Percentage (%) | Percentage (%) | Percentage (%) | Percentage (%) |
|---|---|---|---|
| 1 | Based on symptoms | 71 | 23.67 |
| 2 | Hormone test | 50 | 16.67 |
| 3 | Ultrasonography | 35 | 11.7 |
| 4 | All the above | 29 | 9.67 |
| 5 | I don't know | 114 | 38.00 |
| | Total | 100 | 100 |

## Table no 6. 6 what are the treatment options available



**Fig 7**

### The attitude of participants towards PCOS

27.67% reported as weight loss reduction help in healthy lifestyle.10.67% to monitor insulin level, 24.67 helps in weight reduction.8.67% reported all of the above 28.33 % do not know the weight loss reduction in PCOS helps in .28% of the participants reported weight loss reduction helps to improve ovulation, 35.33% participants reported weight loss reduction help to improve physiological condition, 13.33% reported all of the above 23.33 % don't know weight loss reduction helps. 17.67% of participants reported that diet helps in maintaining hormone balance, 30% reported as exercise help in maintaining hormone balance.16.33% of the participants reported that medication helps in maintaining hormone balance.11% of the participants reported all of the above as maintaining the hormone in balance.25% don't know.

## Table no 6.7 what do you think weight loss reduction help in PCOS

| S. No | Answer option | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Healthy lifestyle | 83 | 27.67 |
| 2 | Monitor insulin level | 32 | 10.67 |
| 3 | Weight reduction | 74 | 24.67 |
| 4 | All the above | 26 | 8.67 |
| 5 | I don't know | 85 | 28.33 |
| | Total | 100 | 100 |

## Table no 6.8 what do you think weight loss reduction help in achieving

| S. No | Answer option | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Improve ovulation | 84 | 28 |
| 2 | Improve Physiological condition | 106 | 35.33 |
| 3 | All the above | 40 | 13.33 |
| 4 | I don't know | 70 | 23.33 |
| | Total | 100 | 100 |

### Table no6.9 what do you to maintain the hormone balance in control

| S.No. | Answer option | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Diet | 53 | 17.67 |
| 2 | Exercise | 90 | 30 |
| 3 | Medication | 49 | 16.33 |
| 4 | All the above | 33 | 11 |
| 5 | I don't know | 75 | 25.00 |
| | Total | 100 | 100 |

#### Pcos major effect on skin

39.33% reported as acne as major symptoms of pcos.13.67% participants reported hair loss as symptoms of pcos, 20.67 as acne scar,11%all of the above ,15.33 do not the effect on the skin.40 % of the participants heard about hirsutism, 58.67% did not heard about hirsutism , 48.67% reported unwanted facial hair as hirsutism,17.67% reported as no hair.33.33%do not know about hirsutism.22% of the participants reported hirsutism effect mostly on chin, 40% reported chest and thigh,14% reported chin , chest & thigh, 24% participants do not know part of the body which hirsutism effect.19.67% reported nose to be effected in seborrheic dermatitis,39.33% reported eyebrow and ear to be effected in seborrheic dermatitis,15% reported as nose , eyebrow &ear ,26% do not know the part of the body were seborrheic dermatitis effect.24.33% reported over the lips as the major hair growth seen in the patient ,25% reported as lower back,26.67% as lower abdomen,10.67% as all of the above ,3.33% do not know major hair growth,41% of the participants suffering from skin tags ,59% of the participants not suffering from skin tags.37.33 % were suffering from acanthosis nigrican, 62.33% were not suffering from acanthosis nigricans.

### Table no 6.10 what are the major symptoms of PCOS patients suffer

| S. No | Answer option | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Acne | 118 | 39.33 |
| 2 | Hair loss | 41 | 13.67 |
| 3 | Acne scar | 62 | 20.67 |
| 4 | All the above | 33 | 11 |
| 5 | I don't t know | 46 | 15.33 |
| | Total | 100 | 100 |
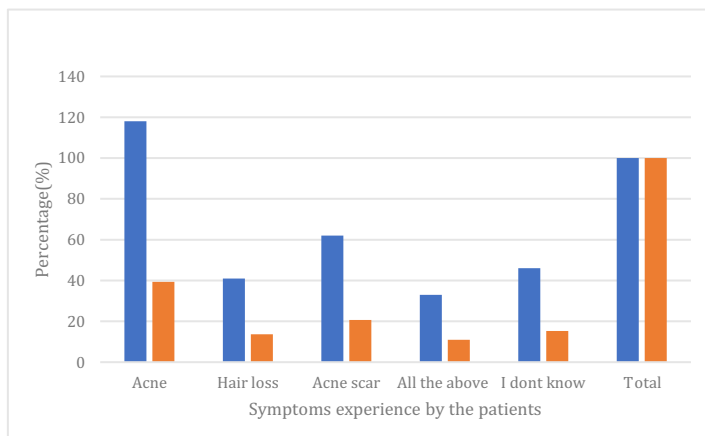


### Fig 8

### Table no 6.12 have you heard about hirsutism

| S. No | Answer option | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Yes | 120 | 40 |
| 2 | No | 176 | 58.67 |
| | Total | 100 | 100 |

### Table no 6.12 what is hirsutism

| S. No | Answer option | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Unwanted facial hair | 146 | 48.67 |
| 2 | No hair | 53 | 17.67 |
| 3 | I don't know | 100 | 33.33 |
| | Total | 100 | 100 |
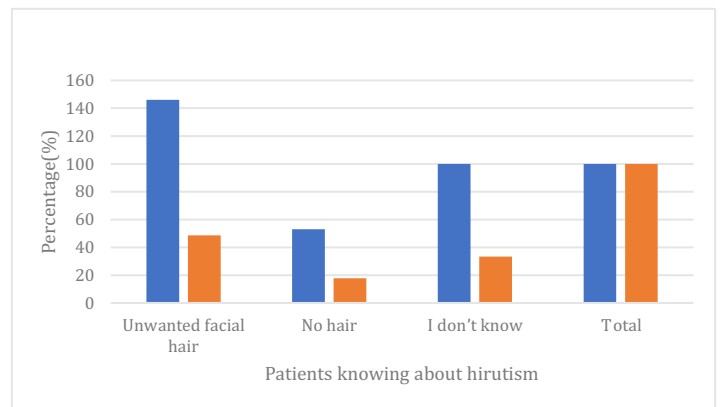


### Fig 9

### Table no 6.14 which part of hirsutism effect

| S. No | Answer option | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Chin | 66 | 22 |
| 2 | Chest and thigh | 120 | 40 |
| 3 | Both a&b | 42 | 14 |
| 4 | I don't 't know | 72 | 24 |
| | Total | 100 | 100 |
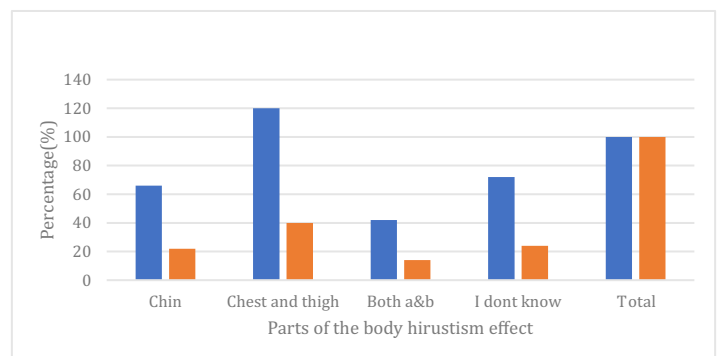


### Fig 6.10

### Table no 6.15 are you suffering from seborrheic dermatitis

| S. No | Answer option | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Yes | 94 | 31.33 |
| 2 | No | 204 | 68 |
| | Total | 100 | 100 |

**Table no 6.16 which part of the body seborrheic dermatitis affect**

| S. No | Answer option | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Nose | 59 | 19.67 |
| 2 | Eyebrow & ear | 118 | 39.33 |
| 3 | Both a&b | 45 | 15 |
| 4 | I don't know | 78 | 26 |
| | Total | 100 | 100 |
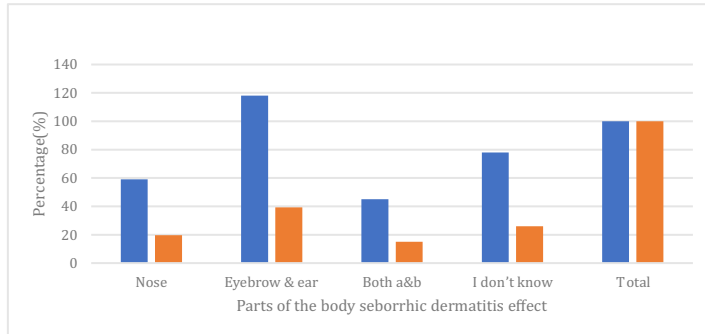


**Fig 6.11**

**Table no 6.17 what are the major hair growth seen in patients**

| S. No | Answer option | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Over the lips | 73 | 24.33 |
| 2 | Lower back | 75 | 25 |
| 3 | Lower abdomen | 80 | 26.67 |
| 4 | All the above | 32 | 10.67 |
| 5 | I don't know | 40 | 13.33 |
| | Total | 100 | 100 |
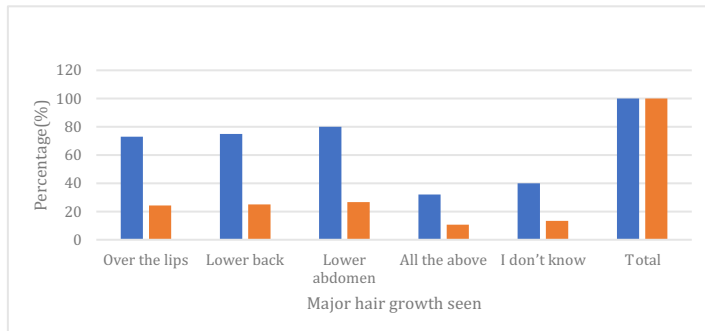


**Fig 6.12**

**Table no 6.18 are you suffering from skin tags.**

| S. No | Answer option | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Yes | 123 | 41 |
| 2 | No | 177 | 59 |
| | Total | 100 | 100 |

**Table no 6.19 are you experiencing dark patch on skin / acanthosis nigrican**

| S. No | Answer option | Number(n) | Percentage (%) |
|---|---|---|---|
| 1 | Yes | 112 | 37.33 |
| 2 | No | 187 | 62.33 |
| | Total | 100 | 100 |

## Discussion

19.67% heard about pcos which is contrary to the study conducted by Jia Ean goh et al where 61.20% heard about pcos which is contrary to the study conducted by [13], where 89% heard about pcos.57.33% reported that they don't know about pcos which is contrary to the study conducted by [14] 39.8% reported absence of periods leading to an imbalance of female sex hormone.40 % don't know the reason for pcos which is contrary to [15] where 32.1% of genetic factors are responsible for pcos. 36.67% don't know the symptoms of pcos which is contrary to [16] where 56.9% of hair loss a symptom of PCOS. 38% don't know the diagnosis of PCOS which is contrary to [17] were pcos diagnosed by vaginal ultrasound. Another study conducted which is contrary to Jia ean goh was 57% pcos can be diagnosed by ultrasound where 35% don't know the treatment option for pcos which is contrary to [18] where 44.44% answered as weight reduction as a treatment option for PCOS which is contrary to [19] where 43% weight reduction and medical management is the treatment option. About 28.33% don't know the weight loss reduction helps in.13.33% both (improve ovulation and improve physiological conditions) weight loss help in which is contrary to the study conducted by [20] were 60.61% reported improve ovulation and improve physiological conditions) weight loss helps in.25% don't know how to control hormone imbalance.65.79% reported that both diet and exercise help in maintaining hormone in control study is contrary to [22]. 39.33% of acne as major symptoms patient experienced in pcos .71,7% experienced acne which is similar to the study conducted by [24] 46.30% experienced acne as symptoms of PCOS which is similar [23]. 77% experience hair loss as major symptom of pcos the study is contrary to [24]. 58.67% didn't hear about hirsutisms .63% did not hear about hirsutism the study is similar to [25]. 70.5% heard about hirsutism where the study is contrary to [24] 48.67% reported unwanted facial hair as hirsutism the study is similar to [25].76% reported to have hirsutism which is almost similar to [27]. 40% hirsutism effect chest and thigh the study is similar to [26]. 68% of the participant not suffering from seborrhoea dermatitis .26.67% major hair growth seen lower abdomen study is similar to [28]. 59% of participants not suffered from skin tags. 37.33% suffered from acanthosis nigirican.

## Conclusion

It can be concluded from the study majority of the participants were in the age group of 18- 25 having intermediate education and were found to be married housewives as their occupation majority of the participants had a history of diabetes. Only 46.77% of the participants had knowledge about pcos. 29.55% of the participants had favorable attitude and practice toward pcos.48.84 % of the participants had knowledge about PCOS and their major effect on skin .majority of the participants experienced acne and hirsutism. 39.33% suffered from seborrhea dermatitis which patient experienced on eyebrows and ear. Hence effective pharmacist counseling need to be implemented.

**Conflict of interest:** there is not conflict of interest.

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