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POLYCYSTIC OVARIAN SYNDROME(PCOS), AWARENESS AMONG FEMALE STUDENTS, QASSIM UNIVERSITY, QASSIM REGION, SAUDI ARABIA

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Abstract

Introduction: Polycystic Ovarian Syndrome (PCOS) is a condition that affects a woman's hormone levels and it is said to be the most common female syndrome. Affects between 4-8% of reproductive-aged women and is associated with reproductive, metabolic and psychological dysfunction.

Methods: A Quantitative observational cross-sectional study, we recruited 350 students of Qassim University selected using random sampling according to the inclusive criteria (age between 18-25 years). An online questionnaire designed in Arabic to facilitate the data collection, and university students, participated voluntarily. Statistical data entry and analysis of results was performed using Microsoft Excel.

Results: Our sample size was 350 Qassim University students whose ages were between 18-25 years. 71% (n=248) Students heard about the PCOS, 49% of them heard about the symptoms from other people (mother, sister, cousin, etc.). The presence of the symptoms of PCOS among these students was as, the most common symptoms were Hair loss 74%, Mood swing 67%, Acne 61%, and the least common symptom was Voice change 8%. The prevalence of the syndrome among the university students was found to be 12% of these 350 students suffer from PCOS (diagnosed).

Conclusion: 71% of studens were aware about the Polycystic Ovary Syndrome. 12% of students suffered from PCOS. Most common symptoms reported was Irregular menstrual cycle, 87%, and the least common symptom was Voice change 13%. 62 % of the students who suffered from PCOS were taking treatments based on hormonal therapy and surgical intervention. Attitude and Practices showed misconceptions about PCOS, and a need for awareness.

Keywords: Polycystic Ovarian Syndrome; Awareness; Hirsutism; Irregular Menstrual Cycle.

1. Introduction

The Ovaries are the female gonads and have two main functions: the monthly release of mature ova and the secretion of steroid hormone. Both of these functions are controlled by hormones Follicle-stimulating hormone (FSH) and Luteinizing hormone (LH) from the interior pituitary. (Carton J; et al ,2007)

Polycystic Ovarian Syndrome (PCOS) is a condition that affects a woman's hormone levels and it is said to be the most common female syndrome. (Gul S; et al, 2014). It can be considered as a multi organ syndrome as it can affect adrenal and sex hormones along with pituitary hormones including adrenocorticotropic hormone (ACTH), gonadotropins and growth hormone. (Glintborg D; Andersen M, 2010).

Currently, Rotterdam Criteria is preferred for diagnosing PCOs which says that for establishing the diagnosis of PCOS any two of the following features should be present: anovulation / oligo-ovulation, hyperandrogenemia and appearance of Polycystic Ovaries on ultrasound. (Shroff R; et al, 2007). The World Health Organization classifies Polycystic Ovary Syndrome as a group II ovulation disorder, which are dysfunctions of the hypothalamic-pituitary-ovarian axis. (ESHRE Capri Workshop Group 2012)

Polycystic Ovary Syndrome (PCOS) affects 4% to 18% of reproductive-aged women and is associated with reproductive, metabolic and psychological dysfunction (Moran L; et al, 2011) Women with PCOS are at increased risk for infertility, endometrial hyperplasia and cancer, abnormal glucose metabolism, obstructive sleep apnea, depression, and anxiety. (Solomon C.G; et al, 2016)

Etiology of PCOS is unknown. Many studies suggest that inherent abnormalities of ovarian steroidogenesis and follicular development play a role in the PCOS. The syndrome is also associated with persistently rapid gonadotropin-releasing hormone (GnRH) pulses, an excess of LH, and insufficient FSH secretion, which contribute to excessive ovarian androgen production and ovulatory dysfunction. (Solomon C.G; et al, 2016). Also, a mutation in PCOS proteins interacts with multiple inherited and environmental factors. Multiple inherited genes are responsible for the occurrence of PCOS. (Panda P; et al, 2016)

The most common Symptoms of PCOS include: irregular or no menstrual periods (indicated by unpredictable menses that occur at less than 21-day or greater than 35-day intervals) , heavy periods, Weight gain , Fatigue and lack of energy. Also, hirsutism, Hair loss (or hair loss observed in a certain area of the head), difficulty of pregnancy, Acne and other skin problems such as dark spots, Pelvic pain during menstruation, Frequent and chronic headaches, change in voice, Sleep problems.

Hirsutism, which is defined as androgen-dependent excessive male-pattern hair growth, affects approximately 10% of women. Hirsutism is most often idiopathic, or the consequence of androgen excess associated with the polycystic ovarian syndrome (PCOS). (Kasper D; et al, 2015)

Sleep Apnea, there are sex differences in sleep and its disorders. During sleep, women have an increased amount of slow-wave activity and an in the number of sleep spindles, also, differences

in timing of delta activity. Women with the hyperandrogenic disorder (polycystic ovarian syndrome) have an increased prevalence of obstructive sleep apnea, and apneic episodes are positively correlated with their circulating testosterone levels. In contrast, progesterone accelerates breathing, and in the past, progestins were used for treatment of sleep apnea. (Kasper D; et al, 2015)

Amenorrhea refers to the absence of menstrual periods. Amenorrhea is classified as primary if menstrual bleeding has never occurred in the absence of hormonal treatment or secondary if menstrual periods cease for 3–6 months. (Kasper D; et al, 2015)

Oligomenorrhea is defined as a cycle length >35 days or <10 menses per year. (Kasper D; et al, 2015). Evaluation of menstrual dysfunction depends on understanding the interrelationships between the four critical components of the reproductive tract: (1) the hypothalamus, (2) the pituitary, (3) the ovaries, and (4) the uterus and outflow tract
(Kasper D; et al, 2015)

Complication of Polycystic Ovary Syndrome can be divided into: early-term and Long-term complication. Early-term complication: **Infertility**, and **Obstetric complications.** (Palomba S; et al., 2015)

Long- term complication: **Cardiovascular Risk**, women with PCOS present an increased prevalence of classic risk factors for cardiovascular disease (CVD) such as hypertension, diabetes, dyslipidemia, diabetes, obesity (Palomba S; et al., 2015). **Oncology Risk**, PCOS is considered as a lifelong multi-systemic and multifaceted disorder, with an increased risk of the development of cancers, such as the endometrial, ovarian, and breast cancer, (Palomba S; et al, 2015). **Pychological Complications** and reduced quality-of-life (QoL) compared to healthy women. The prevalence rates of depression in PCOS range from 14% to 67%, with a fourfold greater odd of depressive symptoms compared with age-matched control women. (Palomba S; et al, 2015)

A study about the prevalence of Polycystic Ovarian Syndrome in young unmarried Saudi females, aged 18-28 years, conducted at the medical center of Taibah University Al Madinah Al Munawara, the results, from a cohort of 201 participants, 108 (53.7%) were diagnosed to have PCO with a mean age of 21.3±2.1 years, the demographic details, menstrual irregularities and dermatological manifestation reported in 108 cases of PCOS. (Guraya S S, 2013).   The aim of this study was to evaluate the knowledge of Qassim University students about Polycystic Ovarian syndrome, interpret the prevalence of above mentioned symptoms, awareness about the PCOS, and the importance of early detection and treatment.

2. Research Objectives

1) To evaluate the Knowledge and level of awareness of female students in Qassim university about Polycystic Ovary syndrome.
2) To choose Randomly volunteer students in Qassim University (age between 18-25 years) to do the questionnaire.
3) To determine the prevalence of the symptoms of Polycystic Ovarian syndrome.

4) To educate the students about the syndrome and the importance of early detection and treatment.

3. Methodology

3.1. Study Design

Quantitative observational cross-sectional study.

3.2. Sampling Methods

Volunteer students of Qassim University were selected using random sampling according to the inclusive criteria (age between 18-25 years).

Inclusion Criteria
1) Students in Qassim University.
2) Age of the participant is between 18 – 25 years old.

Exclusion Criteria:
1) Students in other than Qassim University.
2) Participants age less than 18, or more than 25 years old.

3.3. The Questionnaire Consisted Of 3 Sections

First section: Demographics of Qassim university students towards Polycystic Ovary Syndrome. It contained 19 Questions about several factors including age, college, height, weight, duration of the menstrual cycle. Also questions to determine if the students suffered from any of the PCOS symptoms.
Second section: To assess the knowledge of Polycystic Ovary Syndrome among Qassim University students, Saudi Arabia. (Q 20-23)
Third section: To find out, the number of students who had, the syndrome and if they had taken treatment. To assess the family history of Polycystic Ovarian Syndrome, Diabetes, High Blood Pressure or Endocrine disorders. Finally, Open-ended Question to evaluate, the attitude and practices prevalent in the community, regarding PCOS. (Q 24-30)

3.4. Data Collection Technique

An online questionnaire designed in Arabic to facilitate the data collection. Purpose of the study was explained to Qassim university students. The students participated voluntarily by filling the online questionnaire.

3.5. Data Analysis Plan

Statistical data entry and analysis of results was performed using Microsoft Excel, analyzed data using descriptive statistics, with frequency and percent, and the result was presented using tables, Bar and Pie charts.

4. Results

350 Qassim University students whose ages were between 18-25 years participated in the study. The main demographics of the students were presented in Table 1.

Table 1: Demographic characteristics of the students

Variables		Number	Percentage
AGE	18-19	56	16%
	20-21	113	32%
	22-23	154	44%
	24-25	27	8%
COLLEGE	Applied medical sciences	40	11%
	Business & Economics	73	21%
	Medicine	58	17%
	Computer Sciences	19	5%
	Dentistry	2	0.6%
	Pharmacy	12	3%
	Other	146	42%
HEIGHT	145-150	38	11%
	151-155	72	21%
	156-160	126	36%
	161-165	79	23%
	166-170	30	9%
	>170	5	1%
WEIGHT	<40	8	2%
	41-50	94	27%
	51-60	123	35%
	61-70	78	22%
	71-80	29	8%
	>80	18	5%

The majority of students 71% (n=248) heard about the Polycystic Ovary Syndrome, *figure 1*, 49% of students mentioned that the information source was other People (mother, sister, cousin, etc.) *figure2*. Followed by 21% students who mentioned Internet as second source, Hospital as the third information source were selected by 20% students, and College was the fourth source were selected by 11% students. TV 1% students reported as smaller percentage.

Fig 1: Did you Hear about Polycystic Ovary Syndrome ?

Fig 2: From where did you hear about PCOS?
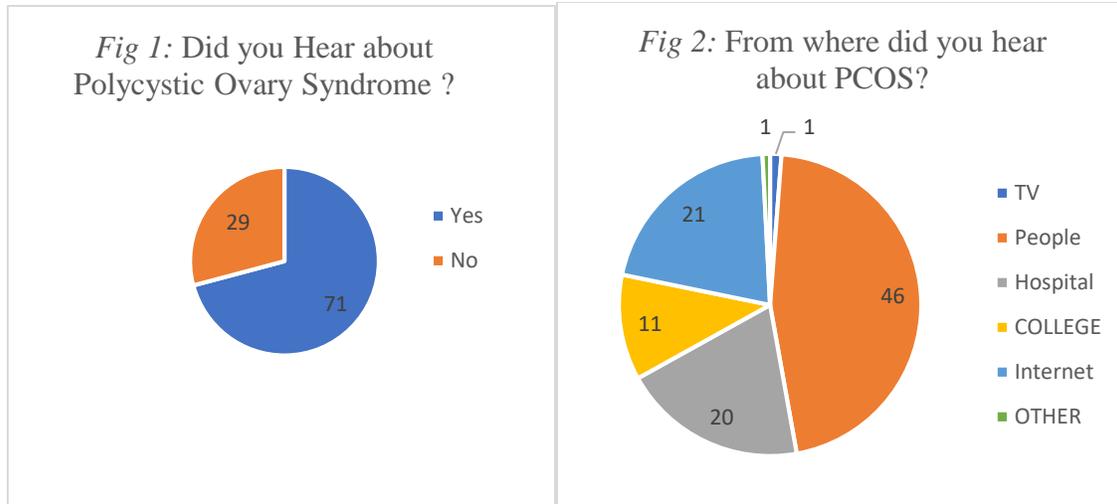
According to the questionnaire, out of these three hundred and fifty students 37% suffered from irregular menstrual cycle or no menstrual cycle (Amenorrhea). Also, we evaluated the prevalence of the other symptoms of Polycystic Ovary Syndrome, based on our finding. 74% students suffered from Hair loss. Other symptoms included: Acne & oily skin, Hair Loss, Weight gain, Mood swings, Frequent headache, Frequent Lower Back Pain, Voice change and Feel Weakness are presented in *Table 2*:

Table 2: Prevalence of PCOS symptoms among Qassim University students

Symptom	Number of Students	Percentage
Hair loss	260	74%
Mood swings	236	67%
Acne & Oily skin	213	61%
Feel weakness and tired easily	193	55%
Frequent Headache and dizziness	162	46%
Hirsutism	144	41%
Frequent Lower back pain	139	40%
Irregular menstrual cycle	128	37%
Weight gain	107	31%
Voice changes	27	8%

In addition, when asked the students "If You Suffered from 2 or more of these Symptoms, are you going to visit a gynecologist?" 44% said "Yes" and 56% said "No**" *Table 3*.

Table 3: Students answers for the question about visiting the gynecologist:

Variable	Number of students	Percentage
Yes	153	44%
No	197	56%

Among those who said "No": when asked them "Why?" and the most common reasons were **showed in *figure 3*:**

fig 3: Why aren't you going to visit a gynecologist ?
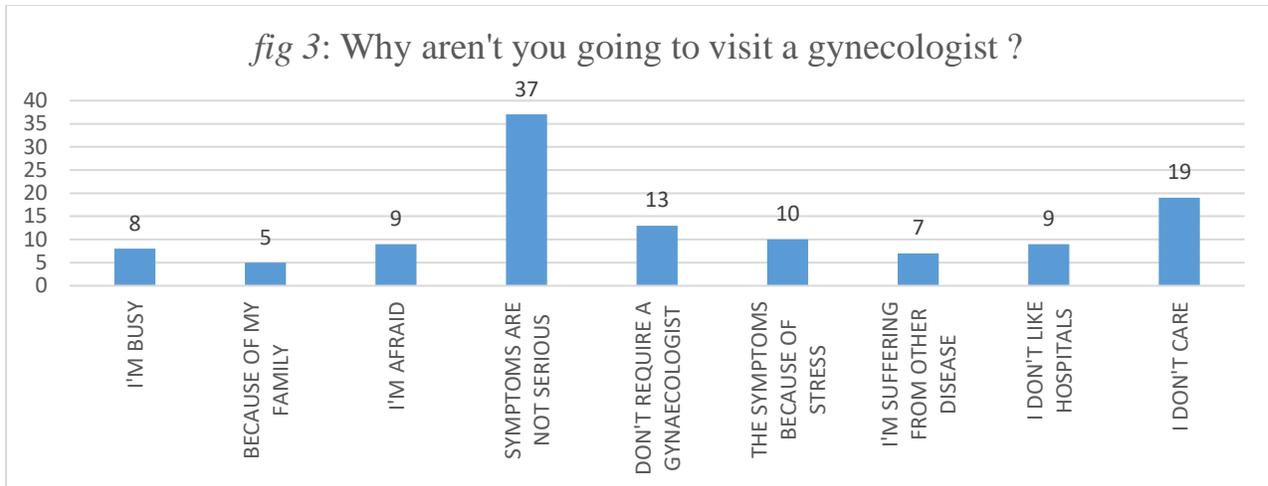
Out of 350 students, 12% students suffered from PCOS (Diagnosed). In relation to Body Mass Index (BMI) *figure 4,* 4% were under weight, 49% were normal weight, 31% were overweight, 11% were obese, 4% were extremely obese. Among those who had been diagnosed with PCOS, the most common symptom was, Irregular menstrual cycle 87%, and the least common symptom was Voice change 13% **Table 4.**
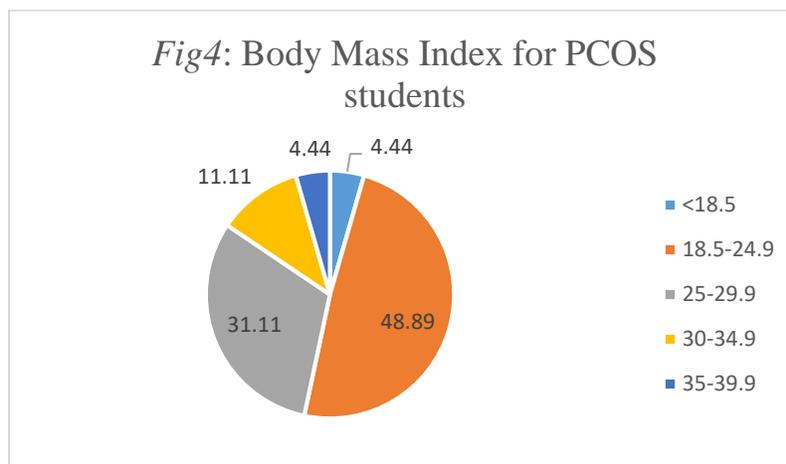

Fig4: Body Mass Index for PCOS students

Table 4: Common Symptoms among students who suffer from PCOS

Symptom	Number of Students	Percentage
Irregular menstrual cycle	39	87%
Mood swings	37	82%
Acne & Oily skin	36	80%
Hair loss	36	80%
Hirsutism	35	78%
Feel weakness & tired easily	33	73%
Frequent Headache & dizziness	27	60%
Frequent lower back pain	26	58%
Weight gain	24	53%
Voice change	6	13%

62% (n=26) of the students who suffered from PCOS were treated for the symptoms using: Glucophage, contraceptive pills, Estrogen hormone, ovariectomy and a married student underwent In Vitro fertilization to become pregnant *figure 5.*
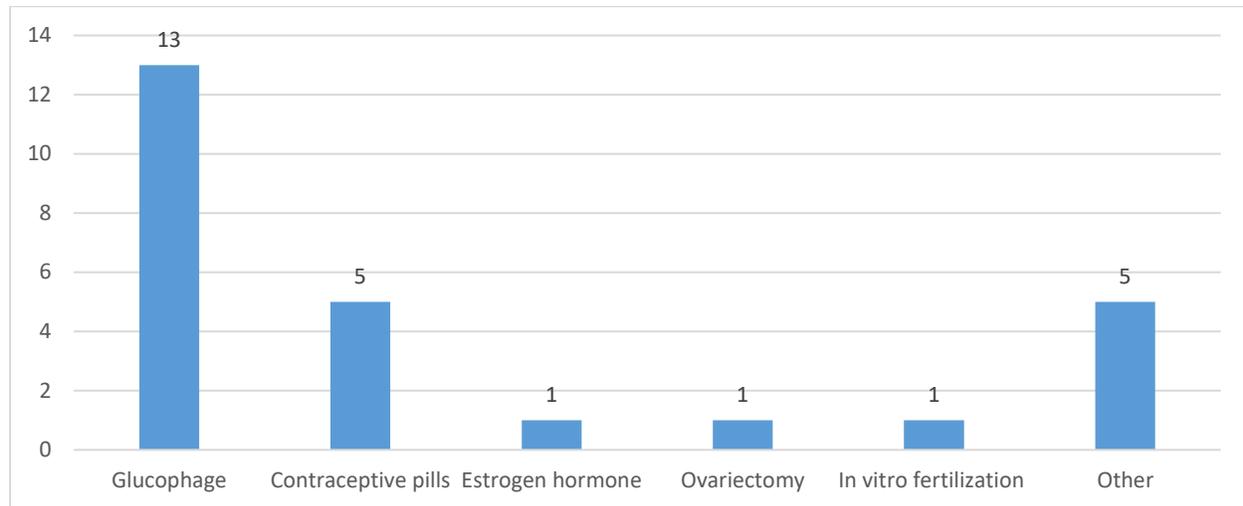
Data collected from PCOS students, 29%, their mothers or sisters also had similar symptoms, and they had been investigated and diagnosed *figure 6.* 53% of PCOS students had family history of Diabetes, High blood pressure or Endocrine disorders (Diagnosed) *figure 7*

Fig 6:Does Your mother/ sister suffer from similar symptoms? and Does she has been diagnosed with PCOS ?

Fig 7 : Do you have family history of diabetes, high blood pressure or endocrine disorders (Diagnosed)?
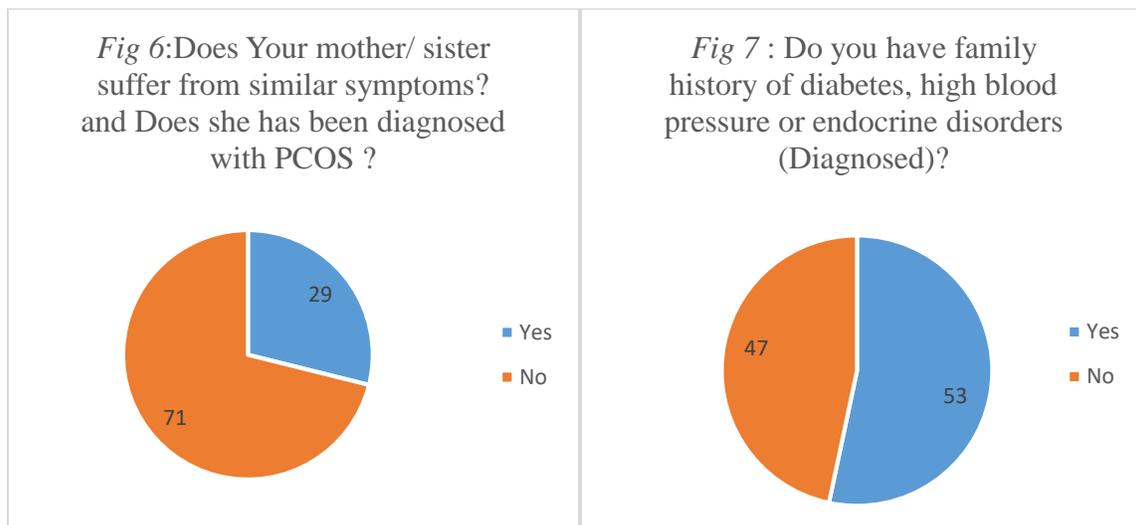
The last Question was about the believes in the community about the syndrome.   Many students didn't know about it, so they wrote "I don't Know about the syndrome", while most thought that, the community needs more awareness because recently, the number of girls affected with the syndrome has increased, and most of them didn't know   that they were affected. **Table No; 5**

Table 5: Attitude and Practices prevalent among the participants.

Answers to Open Ended Questions; Beliefs (Attitude) in Relation to PCOS	Answers to Open Ended Questions; Practices in Relation to PCOS
"PCOS is unknown syndrome and we don't know about it, awareness is necessary".	"Our information is very little, and we are afraid to visit the doctor and detect the cause of the symptoms".
"Never heard anyone from outside the health community talked about it really"	PCOS is not a serious condition and can be treated with herbs, "It is not an important problem and it can be treated by drinking some herbs that have an effect on hormones like Cinnamon and Sage". And "Symptoms will disappear over time"
the PCOS only affect pregnancy and we don't know about the other complications of the syndrome, "Neglecting the symptoms is serious and the most negative effect it delays pregnancy",	"It can be prevented by regulating lifestyle and healthy diet, but if there is a sufficient awareness of the community".
"PCOS has several causes, one the most important is the bad diet which is full of fat, carbohydrate and meats containing hormones (artificially high levels of sex or growth hormones) which cause hormonal disorder."	

5. Discussion

Total number of students who participated in this study was 350. Their age between 18-25 years although PCOS can occur throughout reproductive age (Moran L; et al, 2011), from all colleges in Qassim University. Out of these 350 students 71% (n=248) heard about the Polycystic Ovary Syndrome.

Regarding the sources of information of the students on PCOS 49% (n=114) of students mentioned that the information source was other People (mother, sister, cousin, etc.). Followed by 21% (n=52) students who mentioned Internet and social media as second source, Internet is an important source that we can use to aware women about PCOS, Hospital as the third information source were selected by 20% (n=49) students, and College was the fourth source were selected by 11% (n=28) students. TV 1% (n=3) students reported as smaller percentage.

According to the questionnaire, 74% (n=260) of the students included in the study had Hair loss, 67% (n=236) of students suffer from Mood swings, 61% (n=213) suffer from Acne & oily skin. Also, 37% (n=128) of students have Irregular menstrual cycle. All these symptoms are common in Polycystic Ovary Syndrome.

In addition, when asked students "If You Suffer from 2 or more of these Symptoms, are you going to visit a gynecologist?" 44% said "Yes" and 56% said "No", and some reasons of those who said No were because of there family, Symptoms are not serious, Symptoms don't require a

gynecologist, also, some of them won't go because they are busy, afraid, or they think the symptoms are because of stress.

Only 12% (n=45) students suffer from PCOS. In relation to Body Mass Index (BMI), 4% (n=2) were under weight, 49% (n=22) were normal weight, 31% (n=14) were overweight, 11% (n=5) were obese, 4% (n=2) were extremely obese, which reflects the fact that obesity is a common finding in PCOS. Among those who had been diagnosed with PCOS, the most common symptom is Irregular menstrual cycle 87% (n=39), and the least common symptom is Voice change 13% (n=6).

Other symptoms were also common Such as: Mood swings 82% (n=37), Acne & Oily skin 80% (n=36), Hair loss 80% (n=36), Hirsutism 78% (n=35), Feel weakness & tired easily 73% (n=33), and Weight gain 53% (n=24), several studies in the literature have reported that these symptoms as the main symptoms of the syndrome, like studies in Karachi and Al Madinah Al Munawara . (Gul S et al, and Sheik R et al)

Regarding the treatment of PCOS, 58% (n=26) of the students who suffer from PCOS were treated the symptoms using: Glucophage (Diabetes medicine that helps control blood sugar levels), contraceptive pills, Estrogen hormone, ovariectomy and a married student underwent In Vitro fertilization to become pregnant, similar to what was mentioned in (Ministry of Health Portal-Saudi Arabia, 2015)

From the data collected from PCOS students, 29% (n=13) their mothers or sisters also had similar symptoms, and they had been investigated and diagnosed. Also, 53% (n=24) of PCOS students have family history of Diabetes, High blood pressure or Endocrine disorders (Diagnosed), which suggest that PCOS has a genetic role (Panda P; et al, 2016).

The last Open-end question was about the Thought of the community about the PCOS, most answers suggested that there were misconceptions about PCOS and the community needed awareness regarding PCOS.

6. Conclusion

71% of studens were aware about the Polycystic Ovary Syndrome. 12% of students suffered from PCOS. Most common symptoms reported was Irregular menstrual cycle, 87%, and the least common symptom was Voice change 13%. 62 % of the students who suffered from PCOS were taking treatments based on hormonal therapy and surgical intervention. Attitude and Practices revealed misconceptions about PCOS, and a need for awareness. We recommend early screening programs in Saudi Arabia, to detect the syndrome among female teenagers.

7. Appendix

Questionare
College of Applied Medical Science, at Qassim University, Main Campus.
Questionnaire to determine students' knowledge about Polycystic Ovaries Syndrome.
All the data collected was   kept confidential and used for research purpose.

Do you want to participate? □ Yes   □ No.

Please answer the questions to the best of your knowledge and ability by filing in the blanks and marking your choice of answers with a tick mark (√).

1. your Name (optional): _____
2. your college: □Applied medical sciences   □Medicine □Computer Sciences □College of Business & Economics □ other: _____
3. What is your current age? _____ years.
4. Please, Indicate your current Height: _____ cm.
5. Please, Indicate your current Weight: _____ kg.
6. Are you married? □ Yes   □ No
7. (If Yes) Do you feel problem in conception? □ Yes   □No
8. What is the duration of your monthly menstrual cycle? _____ days.

Question	Yes	No
9. Do you suffer from irregular menstrual cycle? or no menstrual cycles?		
10. Do you suffer from Acne? or oily skin?		
11. Do you suffer from hair loss (or hair loss in particular area of the hair)?		
12. Did you experience excessive facial or body hair?		
13. Do you suffer from Weight gain?		
14. Do you suffer from Mood swings?		
15. Do you feel lonely, loss of interest, or very aggressive frequently?		
16. Do you experience frequent Headache, dizziness?		
17. Do you suffers from chronic, frequent lower back pain?		
18. Do you observe any change in voice?		
19. Do you get tired easily / feel weakness?		

20. If You Suffer from 2 or more of these Symptoms, are you going to visit a gynecologist? □ Yes □No
21. If No, Why? _____
22. Did you hear about Polycystic Ovary Syndrome? □ Yes   □ No
23. If Yes, From Where? □ Television □Internet/Social Media   □people   □Hospital   □Other: _____
24. Do you suffer from Polycystic Ovary Syndrome (Diagnosed)? □Yes   □No
25. If Yes, did you treat the syndrome? □ Yes   □No
26. If Yes, could you mention the treatment? _____
27. Does your mother / sister suffer from similar symptoms? □Yes   □No
28. Have they been investigated & diagnosed? □ Yes   □No
29. Do you have family history of Diabetes, High blood pressure or Endocrine disorders (Diagnosed)? □ Yes   □No.
30. What do think about this disorder? What are the thoughts common in the population?

References

[1] Carton J; Daly R; Ramani P, 2007, Clinical pathology, 1st edition, Oxford university: Oxford, England.

[2] Drake RL; Vogl AW; Mitchell AWM ,2014, Gray's Anatomy for Students, Third edition, Churchill Livingstone, Philadelphia, PA.

[3] ESHRE Capri Workshop Group, 2012, Health and fertility in World Health Organization group 2 anovulatory women, Human Reproduction Update, 18, 5, 586- 599.

[4] Glintborg D; Andersen M, 2010, An update on the pathogenesis, inflammation, and metabolism in hirsutism and polycystic ovary syndrome, Gynecological endocrinology, 26(4), 281- 296.

[5] Gul S; Zahid S A; Ansari A, 2014, PCOS: Symptoms and Awareness in Urban Pakistani Women, IJPRHS, 2, 356-360.

[6] Guraya S S, 2013, Prevalence and ultrasound features of polycystic ovaries in young unmarried Saudi females, JMAU, 1, 30-34.

[7] Kasper D; Fauci A; Hauser S; Longo D; Jameson J; Loscalzo J, 2015, Harrison's Principles of internal medicine, 19th ed. New York: McGraw-Hill Education.

[8] Marshall J and Dunaif A, 2012, Should all women with PCOS be treated for insulin resistance?, Fertility and Sterility, 97(1), pp.18-22.

[9] Ministry of Health Portal -Kingdom of Saudi Arabia , 2015, Polycystic Ovary Syndrome , Ministry of   Health   , https://www.moh.gov.sa/HealthAwareness/EducationalContent/Diseases/Otherdiseases/Pages/002.aspx

[10] Moran, L; Hutchison S; Norman R; and Teede, H, 2011, Lifestyle changes in women with polycystic ovary syndrome, Cochrane Database of Systematic Reviews, (7).

[11] Palomba S; Santagni S; Falbo A; La Sala G, 2015, Complications and challenges associated with polycystic ovary syndrome: current perspectives, Int J Womens Health, p.745.

[12] Panda P; Rane R; Ravichandran R; Singh S; and Panchal H, (2016), Genetics of PCOS: A systematic bioinformatics approach to unveil the proteins responsible for PCOS, Genomics Data, 8, pp.52-60.

[13] Rotterdam ESHRE/ASRM-Sponsored PCOS Consensus Workshop Group; authors, revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome, Fertil Steril ,2004;81:19–25, https://www.ncbi.nlm.nih.gov/pubmed/14711538

[14] Sheik R, 2015, Awareness of Obesity as a Risk Factor for Polycystic Ovary Syndrome, JPSR, 7(7), 471-473.

[15] Shroff R; Syrop C; Davies W; Voorhis BV; Dokras A, 2007, Risk of metabolic complications in the new PCOS phenotypes based on the Rotterdam criteria, 88, Fertility and Sterility; ASRM, http://www.fertstert.org/article/S0015-0282(07)00163-X/pdf .

[16] Solomon C G; McCartney C R; Marshall J C, 2016, Polycystic ovary syndrome. NEJM, 375(1), 54-64.

[17] Waugh A, Grant A (2014) Ross and Wilson Anatomy & Physiology in Health and Illness. Twelfth edition. Churchill Livingstone, Edinburgh.

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