

Awareness and Features of PCOS in Students of AlMaarefa University 2019 – 2020

Mona A. AlFadeel ¹, Norah AlRabeeah ², Husna Mirza ², Wesal AlOtaibi ²,
Mayar Alhudaib ², Amjad AlDossary ², Naseem AbuSharifa ², Maryam Alwan ³

(1) Assistant Professor of community medicine, AlMaarefa University, Riyadh, Saudi Arabia

(2) Medical Intern, AlMaarefa University, Riyadh, Saudi Arabia

(3) Medical Student, AlMaarefa University, Riyadh, Saudi Arabia

Corresponding author:

Norah AlRabeeah

Medical Intern, AlMaarefa University,
Riyadh, Saudi Arabia

Email: Norah.am.alr@gmail.com

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Abstract

Background: PCOS affects all women of reproductive age, especially adolescents. In KSA, the estimated prevalence of PCOS is 53.7%. The feasibility of conducting such a study justifies the need for providing an opportunity for early detection and prevention of morbidities among adolescents.

Objective: The aim of this study is to identify the awareness and features of PCOS in students of AlMaarefa University, Riyadh.

Methods: It is an observational descriptive cross-sectional study design of 216 female students based on a questionnaire consisting of 3 sections: demographic data, knowledge and quality of lifestyle. All data was cleaned, coded, and entered using SPSS.

Result: It was found that 64% of PCOS cases had positive family history compared to 32% of non-PCOS students and 11% of those who were not tested for PCOS. (p-value: 0.000). Regarding overweight students, most of them are not tested students 11%, coming after 8% with PCOS and 2% with non-PCOS. It was found that 21% of medical students have excellent knowledge of PCOS symptoms compared with 6.5% of other specialties.

Conclusion: Students with a positive family history are more likely to get PCOS. Excellent level of knowledge regarding PCOS was highly associated with the medical field of the students.

Keywords: PCOS, Awareness, features, students, AlMaarefa University

Introduction

Background:

Polycystic Ovary Syndrome (PCOS) is one of the most common endocrine disorders in women of reproductive age. The symptoms typically associated with PCOS are amenorrhoea, oligomenorrhoea, hirsutism, obesity, subfertility, anovulation and acne. Women with PCOS may display a number of metabolic and cardiovascular abnormalities and several psychological disorders such as depression, anxiety, marital concerns, social problems and sexual impairment. The main cause of the PCOS is unknown but studies say genes are involved. The familial incidence of PCOS is established well and its prevalence differs from different countries and ethnicities. PCOS is diagnosed by biochemical abnormalities on investigation or polycystic ovaries by transabdominal or transvaginal ultrasound. Correcting diet and incorporating exercise are the first line of treatment. Insulin-sensitizing agents, oral contraceptives, spironolactone, and topical eflornithine can be used in patients with hirsutism.

Problem Statement:

Prevalence estimates of PCOS are highly variable, ranging from 2.2% to as high as 26%, globally. Prevalence in Middle Eastern countries is found to be: 1990 NIH 6.1% 95% interval: 5.3-7.1%; 2003 Rotterdam 16.0% 95% interval: 13.8-18.6%; 2006 AES 12.6% 95% interval: 11.3-14.2%. In a 2017 study conducted in KSA on Saudi girls, the estimated prevalence of PCOS was observed to be 53.7%. PCOS affects all women of reproductive age but studies have shown increased incidence in adolescents and young adults. Infertility was found to have negative effects on marital relations as spouses often request divorce or separation.

Justification:

The feasibility of conducting such community-based study justifies the need to upscale this effort to get an overall estimate of the disorder in a diverse sociocultural and economic background, providing an opportunity for early detection and prevention of morbidities among adolescents and young women.

Hypothesis:

Women with PCOS when compared to healthy women, are more likely to have an unhealthy diet, less physical activity, augmented psychosocial disturbances and marital issues due to infertility.

General Objective:

To identify the features of PCOS amongst female students of AlMaarefa University, Riyadh and their awareness regarding PCOS.

Methodology

Study Approach:

Study design:

It is an observational descriptive cross-sectional study design (2019-2020). Study Area and population: The study took place in students of AlMaarefa University in Al-Diriya, Riyadh, Kingdom of Saudi Arabia. AlMaarefa University is a private establishment of higher education. Females of all levels in these colleges: medicine, pharmacy, nursing, respiratory therapy and anesthesia were targeted.

Sample size and technique:

The data was collected from 216 students by non-probability quota sampling technique including the preparatory year students excluding the male section.

Data needs:

Data Collection Tools:

The study was based on a questionnaire that is prepared especially for PCOS. It consists of 3 sections: demographic data, knowledge and quality of lifestyle.

Definition and procedure

Scores of knowledge (out of 9):

>6 correct answers: excellent knowledge
3-5 correct answers: moderate knowledge

<3 correct answers: poor knowledge

Score for effects on quality of lifestyle (out of 21):

>12: strongly affected

7-11: moderately affected

<7: not affected to a great extent

Data Collection Method:

The electronic questionnaire was written in English and Arabic. The link was distributed via the University's email to all female students.

Data analysis & presentation:

All data was cleaned, coded, and entered using SPSS. The results were expressed in tables and graphs as frequencies and percentages. Suitable statistical tests were used.

Ethical consideration:

The protocol of the study was reviewed and approved by the Institutional Review Boards of the Faculty of Medicine, Al-Maarefa University. Permission was taken the same time the participants opened the questionnaire link. The data was kept confidential secured to maintain the privacy. Moreover, data was only used for this research.

Results

Table 1 shows the relationship between family history and occurrence of PCOS among female students in AIMaarefa University. PCOS was positive for (19%), negative for (10%) and not tested for (70%). Of the total, family history was positive for (23%) and negative for the remainder. It was found that (64%) of PCOS cases had positive family history compared to (32%) of non-PCOS and (11%) of those not tested for PCOS. This variation in the proportions of positive family history among the respondents was statistically highly significant. ($p=0.0000$)

Table 1: The relationship between family history and PCOS among the students of AIMaarefa University, Riyadh. (Awareness and features of PCOS in students of AIMaarefa University)

	PCOS	Non-PCOS	Not Tested	Total
Positive family history	27	5	17	49
Negative family history	15	17	135	167
Total	42	22	152	216

Graph 1: The relationship between family history and PCOS among the students of AIMaarefa University, Riyadh. (Awareness and features of PCOS in students of AIMaarefa University)

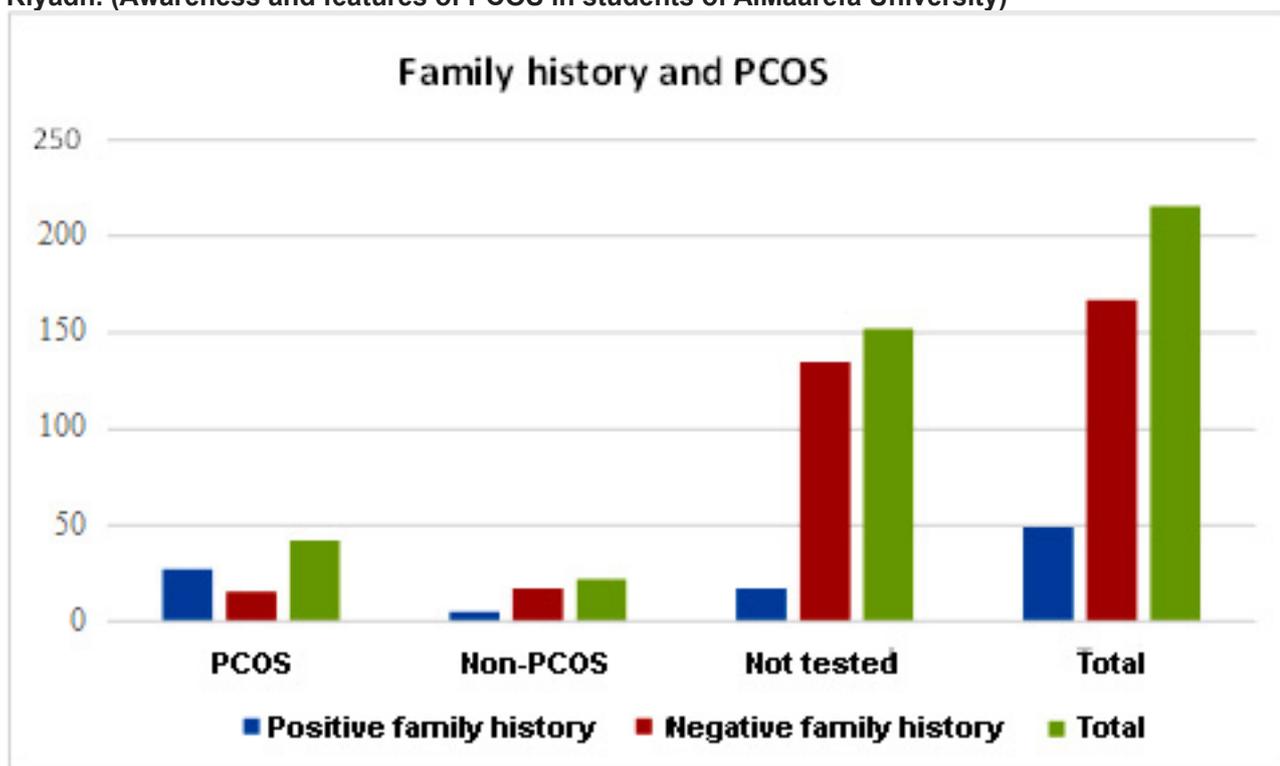
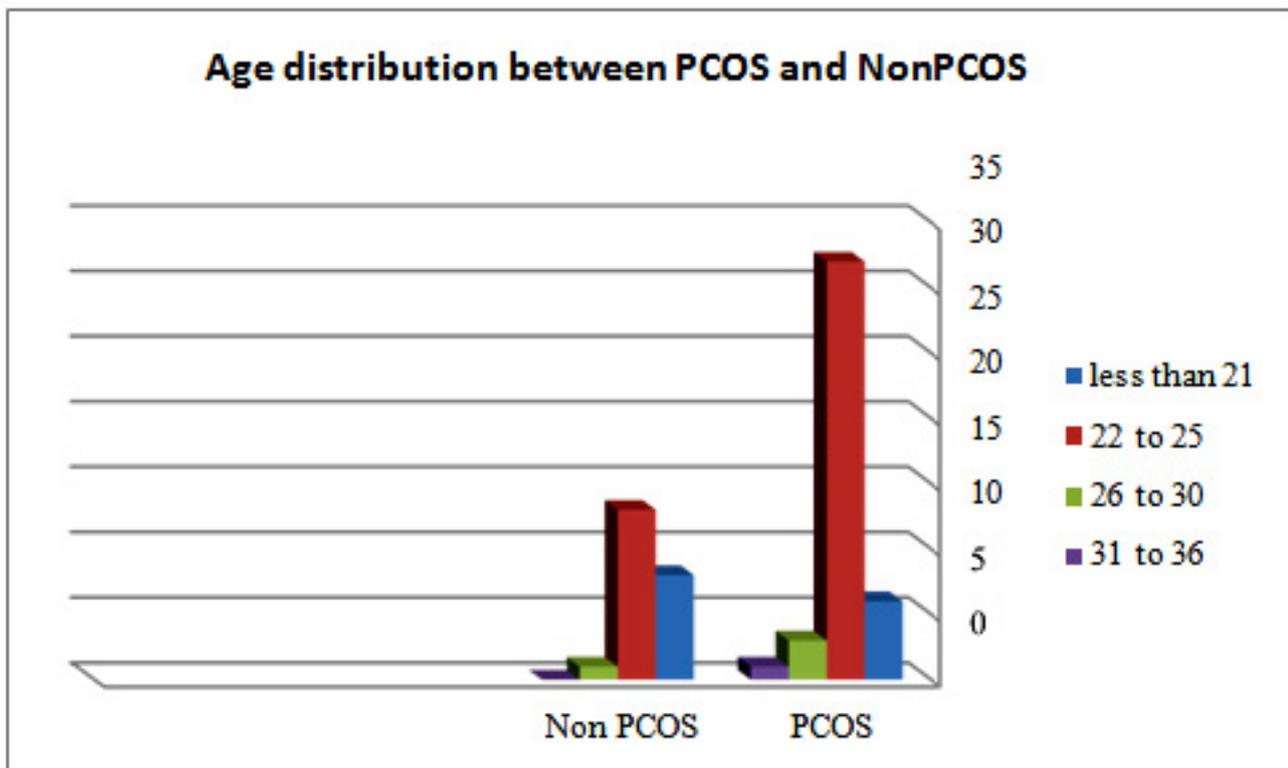


Table 2 shows the relationship between age group and occurrence of PCOS among female students in Al-Maarefa University. It was found that (93%) of PCOS cases were at the age of 21 and above, (91%) of NON-PCOS and (17%) of those Not Tested for PCOS. It was found that (6.90%) of PCOS cases were below the age of 21, (9.20%) of NON-PCOS and (84%) for Not Tested. This variation in the proportions of students above the age of 21 was statistically significant ($p= 0.0004$). PCOS was positive for (19.46 %), negative for (10.18%) and not tested for (70.37%) of the total.

Table 2: The relationship between age group and PCOS. (Awareness and features of PCOS in students of AlMaarefa University)

Characteristics	PCOS		NON-PCOS		Not Tested	
	F	%	F	%	F	%
< 21	6	6.90%	8	9.20%	73	83.91%
22-25	32	26.67%	13	10.83%	75	62.50%
26-30	3	37.50%	1	12.50%	4	50%
31-36	1	100%	0	0.00%	0	0.00%
37-40	0	0%	0	0%	0	0%

Graph 2: The relationship between age group and PCOS. (Awareness and features of PCOS in students of AlMaarefa University)



The data from Table 3 shows the students from different colleges and the occurrence of PCOS. (69%) students from medical college had PCOS which is not very significant compared to the rest of the colleges. (72%) of medical students do not suffer from PCOS, whereas only (27%) from the rest of the colleges, implying a clear link between the awareness of disease and its occurrence.

Table 3: The relationship between different colleges of AlMaarefa University Riyadh and occurrence of PCOS. (Awareness and features of PCOS in students of AlMaarefa University)

Specialty	PCOS		NON-PCOS		NOT TESTED	
	F	%	F	%	F	%
Medicine	29	18.83%	16	10.39%	109	70.78%
Pharmacy	5	16.13%	2	6.45%	24	77.42%
Nursing	1	14.29%	1	14.29%	5	71.43%
Respiratory Therapy	6	40%	1	6.67%	8	53.33%
Anesthesia	1	11.11%	2	22.22%	6	66.67%

Graph 3: The relationship between different colleges of AlMaarefa University Riyadh and occurrence of PCOS. (Awareness and features of PCOS in students of AlMaarefa University)

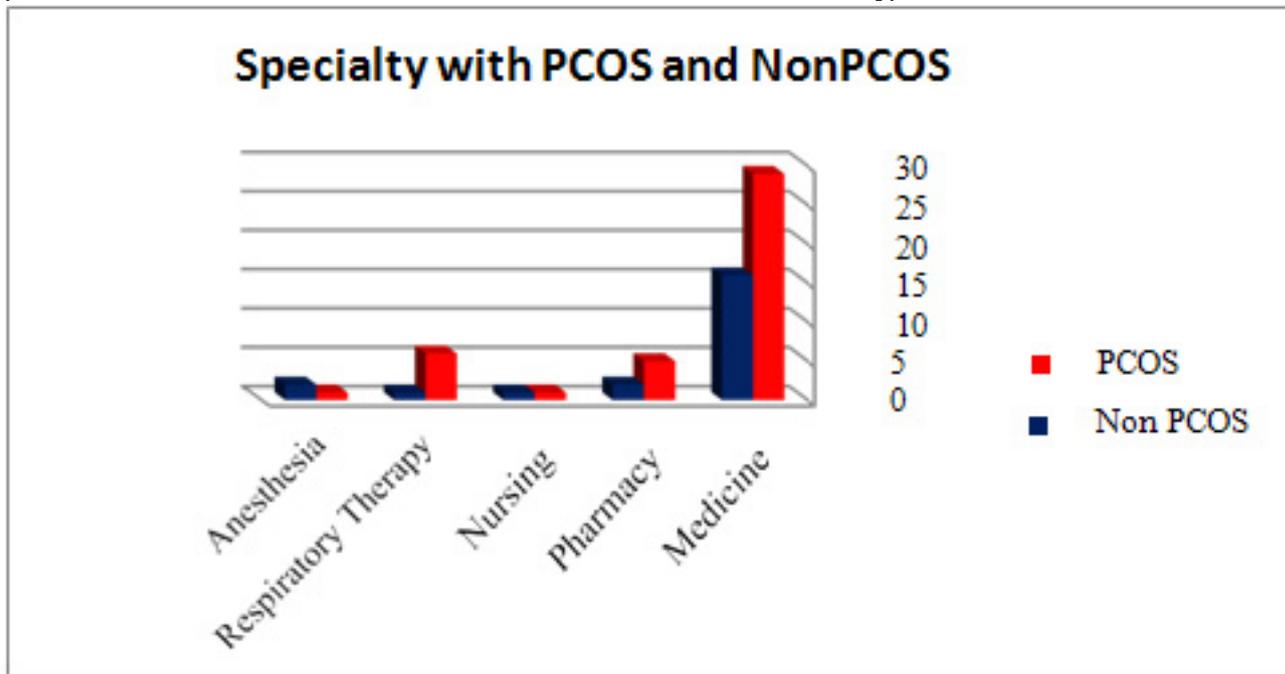


Table 4 shows the relationship between marital status and occurrence of PCOS. It was found that (18%) of PCOS cases were single compared to (10%) of non-PCOS and (71%) not tested for PCOS. The variation among the respondents of those who were single was not significant ($p=0.0739$). Regarding married women, (45%) had PCOS, (9%) did not have PCOS and (45%) were not tested for PCOS.

Table 4: The occurrence of PCOS and its association with marital status of women. (Awareness and features of PCOS in students of AIMaarefa University)

Characteristics	PCOS		NON-PCOS		Not tested	
	F	%	F	%	F	%
Single	37	18.23%	21	10.34%	145	71.43%
Married	5	45.45%	1	9.09%	5	45.45%
Divorced	0	0.00%	0	0.00%	2	100%

Graph 4: The occurrence of PCOS and its association with marital status of women. (Awareness and features of PCOS in students of AIMaarefa University)

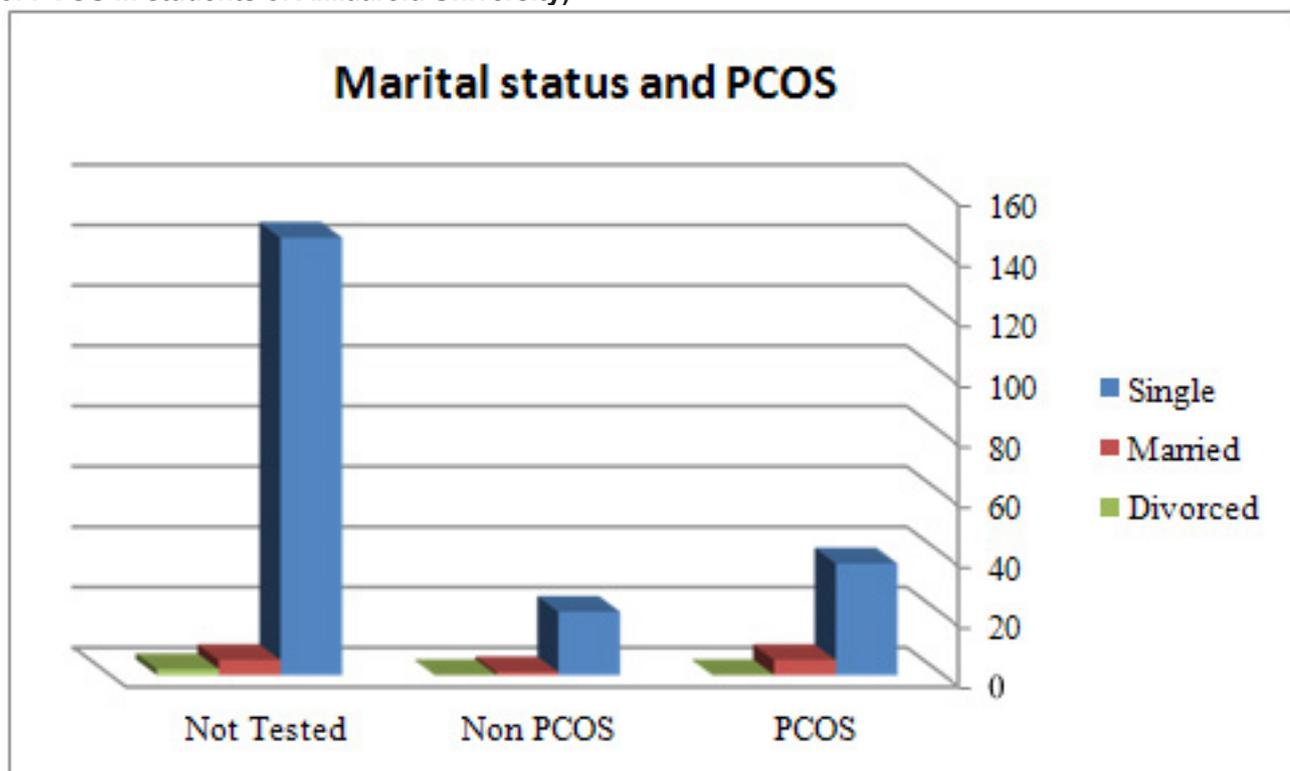


Table 5 shows the relationship between body mass index and the occurrence of PCOS among female students in Almaarefa university. It was found that (11%) of underweight students are not tested for PCOS, (0.46%) are non-PCOS, and (0%) are PCOS students.

Moreover, (38%) of normal weight students are not tested for PCOS, (6%) are non-PCOS, and (8%) are PCOS students. Regarding overweight students, most of them are not tested students (11%), coming after (8%) with PCOS and (2%) with non-PCOS. The table also shows that (10%) of students not tested for PCOS are obese, (2%) are non-PCOS and (4%) are . PCOS students.

Table 5: The relationship between BMI and the occurrence of PCOS among AIMaarefa students. (Awareness and features of PCOS in students of AIMaarefa University)

BMI	PCOS		NON-PCOS		NOT TESTED	
	F	%	F	%	F	%
Underweight	0	0%	1	0.46%	24	11.11%
Normal weight	17	7.87%	12	5.56%	83	38.43%
Overweight	17	7.87%	5	2.31%	24	11.11%
Obese	8	3.70%	4	1.85%	21	9.72%

Graph 5: The relationship between BMI and the occurrence of PCOS among AIMaarefa students. (Awareness and features of PCOS in students of AIMaarefa University)

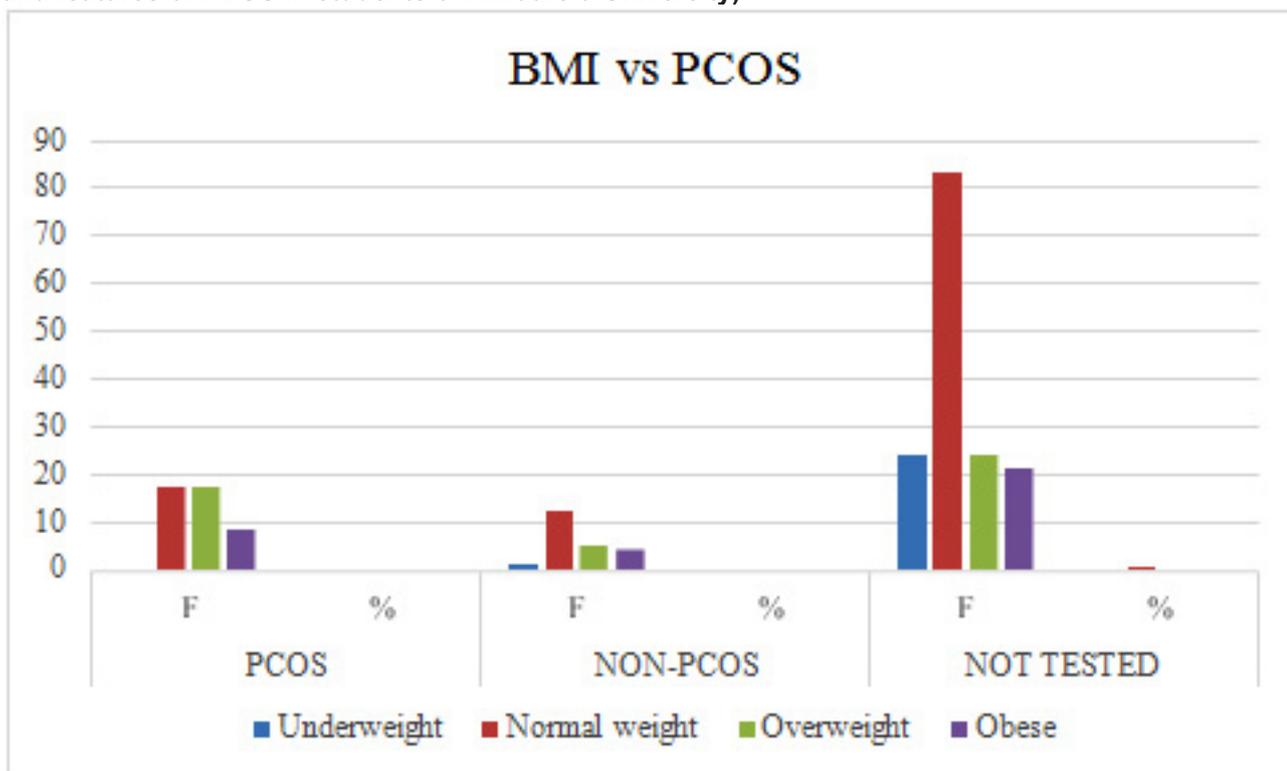


Table 6 shows the relationship between the level of knowledge of symptoms and the specialties of Almaarefa female students. It was found that (21%) of medical students have excellent knowledge of PCOS symptoms compared with (6.5%) of other specialties.

Moreover, (38%) of medical students showed poor knowledge of the symptoms compared to (60%) of other specialties. Considering these percentages among the respondents, the probability was statistically significant ($P=0.0082$).

Table 6: The relationship between the level of knowledge of symptoms with different specialties regarding PCOS. (Awareness and features of PCOS in students of Almaarefa University)

Knowledge	Excellent	Moderate	Poor	Total	P-value
Specialty					
Medicine	33	63	58	154	0.0082 (significant)
Pharmacy	3	11	17	31	
Nursing	1	1	5	7	
Resp therapy	0	4	11	15	
Anesthesia	0	4	5	9	
Total	37	83	96	216	

Graph 6: The relationship between the level of knowledge of symptoms with different specialties regarding PCOS. (Awareness and features of PCOS in students of Almaarefa University)

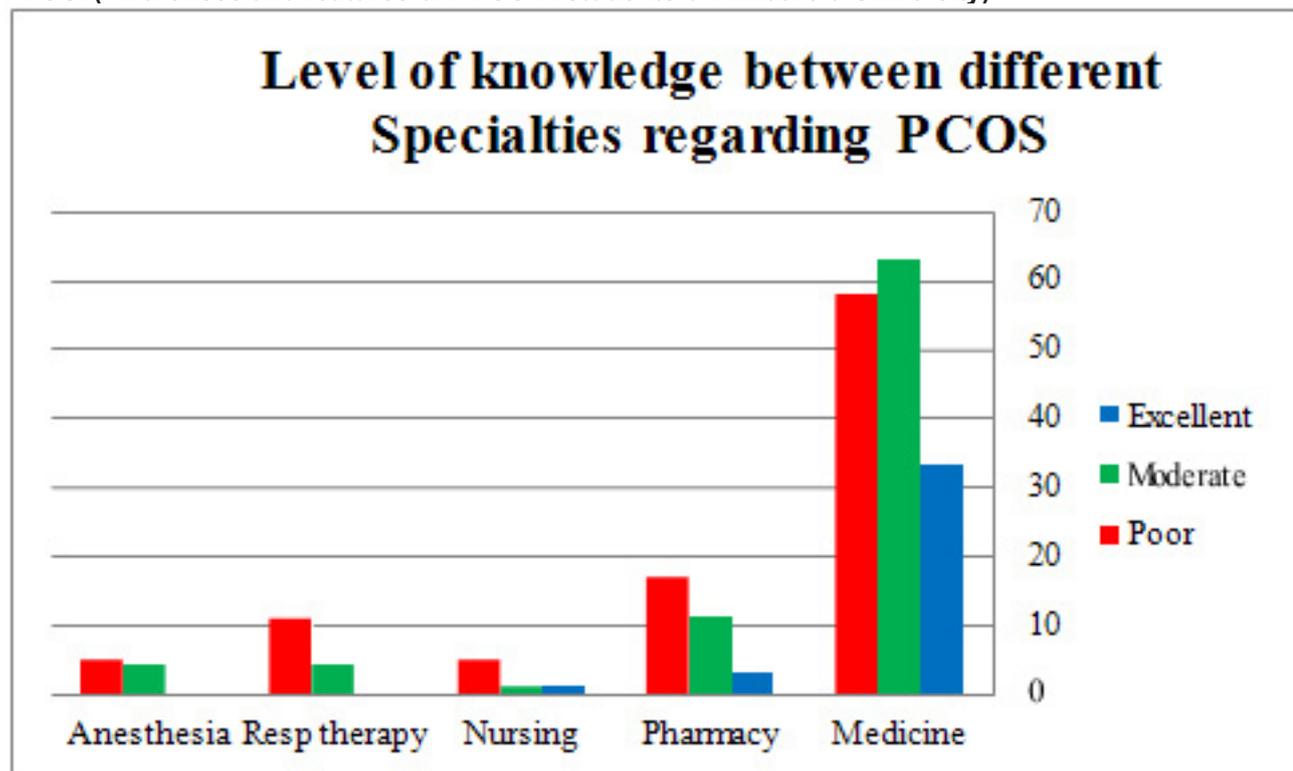


Table 7 shows the analysis of features distribution among students with PCOS, non- PCOS and not tested for PCOS. Of those with PCOS, hirsutism was positive for (35%), menstruation volume was abnormal in (41%), menstruation irregularities were observed in (31%), weight gain was in (30%), hair loss was in (28%), acne in (17%), depression in (23%) moodiness (19%), worried (21%), feeling angry (21%) and having anxiety (19%). Values for hirsutism (p-value= 0.0000), menstruation abnormalities (p-value= 0.0000) and irregularities (p-value= 0.0043), weight gain (p-value= 0.0002) and depression (p-value= 0.0034) in those with PCOS were significant.

Table 7: The relationship between different features of PCOS and the occurrence of PCOS among AIMaarefa students. (Awareness and features of PCOS in students of AIMaarefa University)

FEATURES	PCOS 42	NON-PCOS 22	NOT TESTED 152	Total	P-value
Hirsutism	30	8	48	86	0.0000 (significant)
Menstruation abnormality	21	4	26	51	0.0000 (significant)
Menstruation Irregularity	23	8	42	73	0.0043 (significant)
Weight gain	32	13	63	108	0.0002 (significant)
Hair loss (frontal balding)	19	8	41	68	0.0686 (Not significant)
Acne	33	22	130	185	0.0672 (Not significant)
Depression	36	20	99	155	0.0034 (significant)
Moody	39	21	146	206	0.183 (Notsignificant)
Worried	39	21	127	187	0.004 (Notsignificant)
Tense or feeling angry	40	19	134	193	0.345 (Notsignificant)
Anxiety	38	21	140	199	0.123 (Notsignificant)

Graph 7: The relationship between different features of PCOS and the occurrence of PCOS among AIMaarefa students. (Awareness and features of PCOS in students of AIMaarefa University)

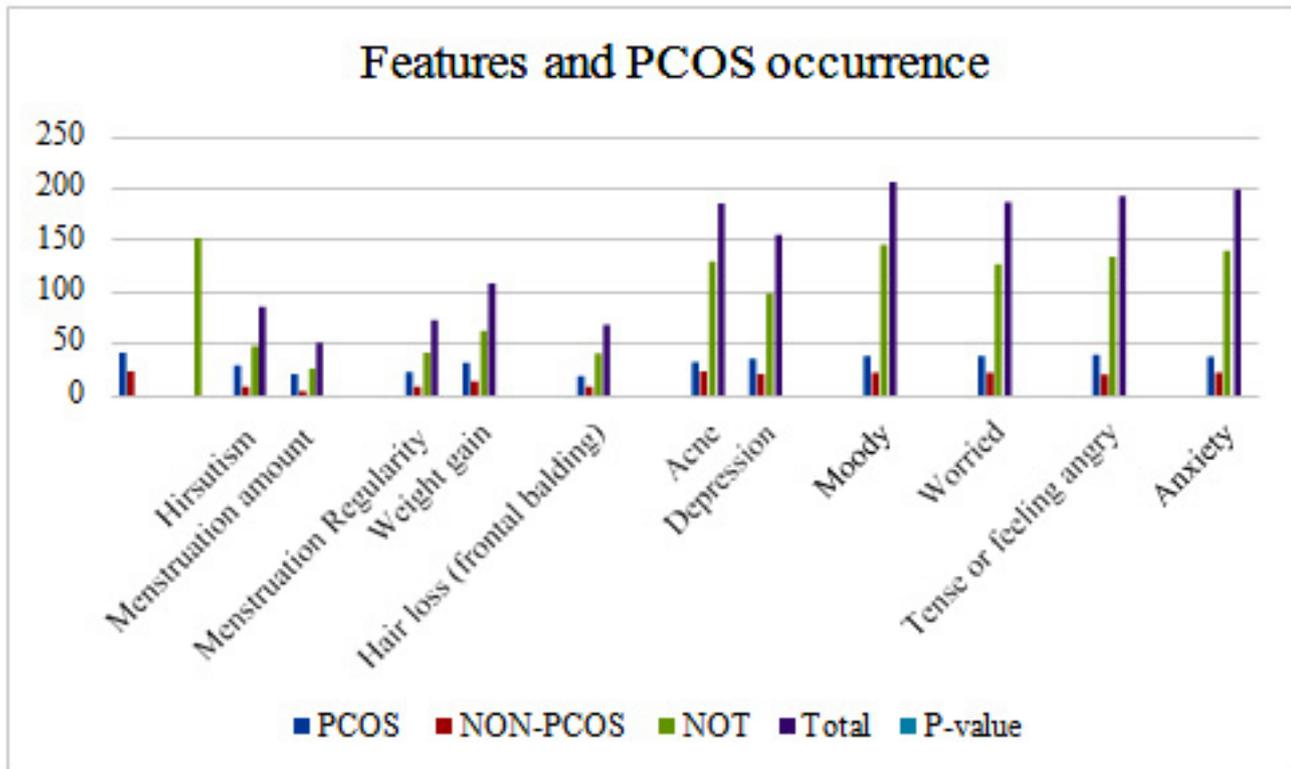


Table 8 shows the relationship between change in life style and occurrence of PCOS among female students in Almaarefa University. It was found that (90%) of PCOS cases exercise and (31%) have restricted their diet.

Table 8: Analysis table for lifestyle distribution among those with PCOS. (Awareness and features of PCOS in students of AIMaarefa University)

Lifestyle	PCOS (42)
Diet restrictions	13
Exercise	38
Do you go for facial hair laserremoval?	19
Do you visit clinics for acnetreatment?	23
Did you consult a dietitian to loseweight?	21
Embarrassed by facial hair	26

Table 9 shows the relationship between self-consciousness about appearance and occurrence of PCOS among female students in Almaarefa University. It was found that (25%) of PCOS cases are self-conscious about their appearance compared to (11%) of non PCOS and (64%) of those not tested for PCOS. This variation in the proportion of self-conscious about appearance and occurrence of PCOS among the respondents was statistically significant. (p= 0.022). The table revealed that the majority of PCOS students who responded were embarrassed about their weight (27%) and (11%) of the PCOS students were not. In comparison to the non PCOS students responders who were embarrassed by their weight numbered (11%) and the non-tested was (62%). This variation in the occurrence of PCOS and weight embarrassment among the respondents was statistically significant. (p= 0.0086).

Table 9 : Analysis table for quality of life distribution among those with PCOS, NON PCOS and not tested. (Awareness and features of PCOS in students of AIMaarefa University)

Quality of Life	PCOS	NON-PCOS	NOT TESTED	Total	P-value
Self-conscious about your appearance	33	14	84	131	0.022
Embarrassed about weight	30	12	68	110	0.0086

Graph 9 : Analysis table for quality of life distribution among those with PCOS, NON PCOS and not tested. (Awareness and features of PCOS in students of AIMaarefa University)

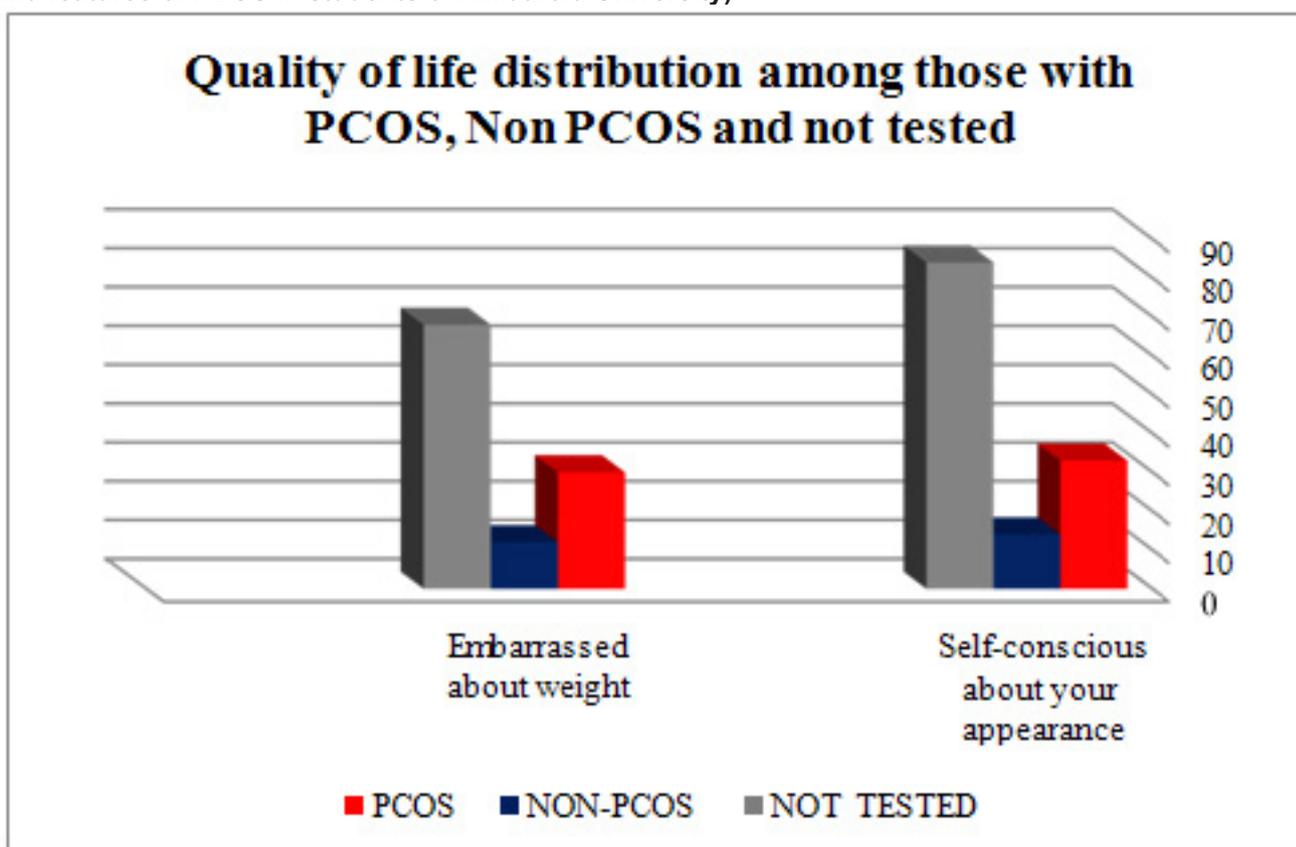
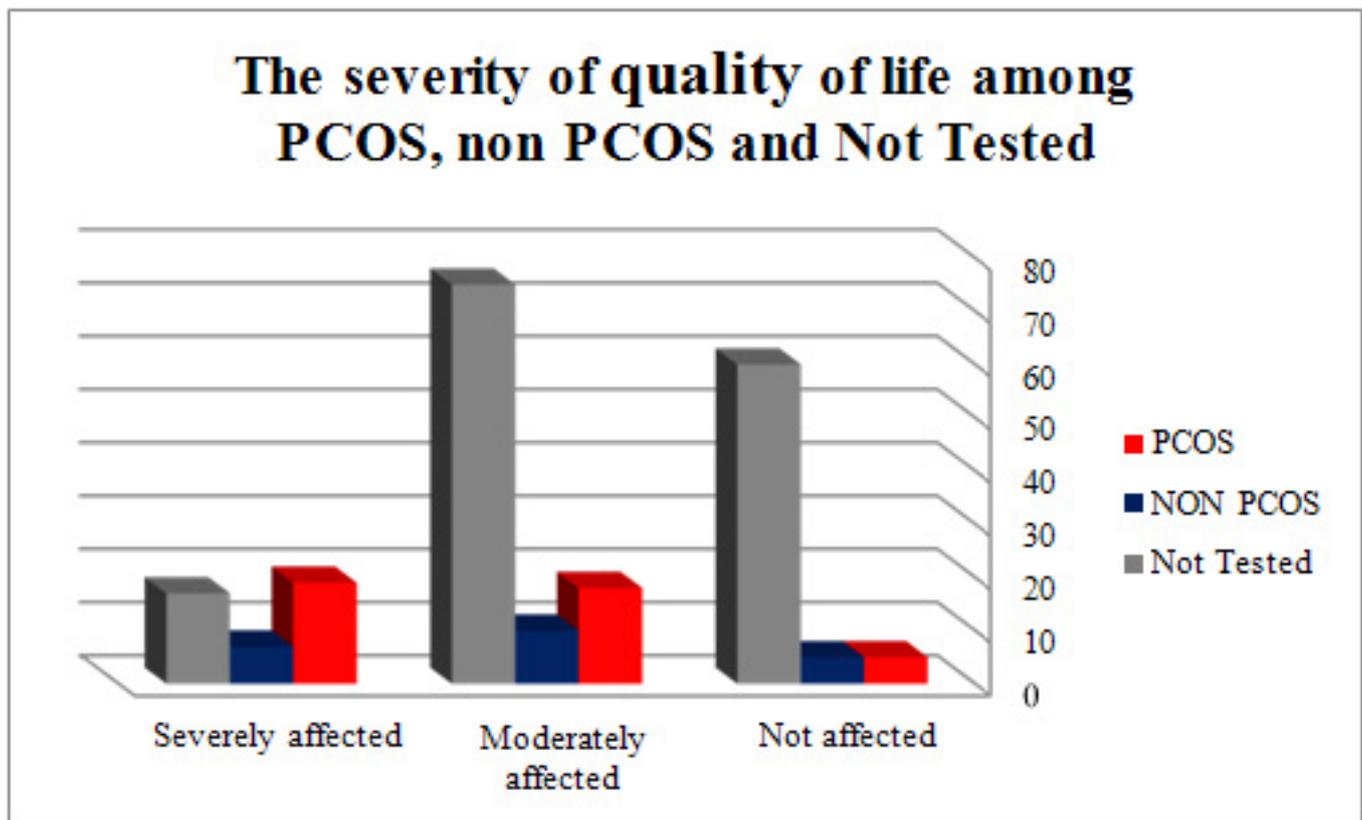


Table 10 illustrates affects on quality of life due to PCOS. The majority of PCOS participant were severely affected by (45%) while (12%) of PCOS participant were not affected by the occurrence of the disease. This is statistically significant. ($p= 0.000$).

Table 10: The severity of quality of life among PCOS, non PCOS and Not Tested. (Awareness and features of PCOS in students of AlMaarefa University)

Quality of Life	PCOS 42	NON PCOS22	Not Tested 152
Not affected	5	5	60
Moderately affected	18	10	75
Severely affected	19	7	17

Graph 10: The severity of quality of life among PCOS, non PCOS and Not Tested. (Awareness and features of PCOS in students of AlMaarefa University)



Discussion

Psychological well-being in the life of women with PCOS in relation to certain PCOS characteristics was explored. The significant higher portions of lower life quality among those with PCOS was expected. In fact, changes in outer appearance, particularly obesity and excessive body hair, but not the presence of acne, were significantly associated with specific aspects of quality-of-life and sexual satisfaction. Affection of quality of lifestyle can also be seen by another study done by Sedighi, Kumarapeli [4, 5]. Higher BMI scores were associated with lower scale scores, indicating decreased quality of life. Obesity as a result of bad lifestyle and food habits tends to be more in PCOS patients. This conclusion was also seen by another study by Silfen [6] The result showed all of the non-obese and the majority of the obese subjects with PCOS had polycystic-appearing ovaries (PAO) on pelvic sonography as shown by Yildez. [7]

Apridonidze concluded the study that the metabolic syndrome (MBS) and its components are common in women with PCOS, placing them at increased risk for cardiovascular disease. Women with PCOS and the MBS differ from their counterparts lacking the MBS in terms of increased hyperandrogenemia, lower serum SHBG, and higher prevalence of acanthosis nigricans, all features that may reflect more severe insulin resistance. [8]

The significantly higher proportion of student of age group 21 and above among those with PCOS was expected. This could reflect on the fact that as environmental stress occurs more with age and college studies, students were more likely to have the disease. Those not tested for PCOS was significantly higher in age group below 21. This shows that a large amount of girls before the age of 21 have not been to the clinic. Deeks in a study in 2010 found depression was increased among those who reported infertility compared with women who did not report infertility. [9] Most of the PCOS students were overweight. PCOS is proposed to be a genetic disease with hormonal imbalances that increase appetite, cause bloating and increase insulin resistance in some patients making it hard to lose weight and easily gain weight. Despite the majority being in medicine a large number of girls are not tested for PCOS. This proves the lack of awareness of PCOS among young girls. This goes in line with other research was conducted by Joshi and Bhattacharya in India in 2014 [10, 11]. This could prove that the disease is a chronic genetic syndrome that occurs gradually under certain environmental factors and if controlled earlier can cause early prevention of the disease.

In a study done by Cinar in turkey who concluded similar results as our study that depression and anxiety are more common in patients with PCOS compared with healthy women. Depression in PCOS might be associated with obesity and metabolic abnormalities including insulin resistance and dyslipidemia. Understanding body image is important to specify the social and psychological

experience of being PCOS. Our result goes in line with other research which was conducted by Barnard and Hahn. [12, 13, 14]

The significantly higher proportion of family history among those with PCOS was expected. In fact, family history is a known risk factor of PCOS. According to a study conducted by Musmar in Palestine in 2014, family history is one PCOS risk factor. It seems that the importance of family history of PCOS cannot be denied. This entails the girls with family history of PCOS should go early for the test. [15] Khomami [16] in his study found PCOS features had significant impact on patients with the disease, as found by our study as well.

The higher proportion of excellent knowledge of PCOS symptoms among medical students with PCOS was expected. According to a study was conducted by AlSibyani; level of awareness, not unexpectedly was related to the high educational level and being student or worker in health background. It seems that the medical students have greater knowledge due to relating their condition with their study. It is important for healthcare providers to know more about polycystic ovarian syndrome because it is a crucial condition in our society. Alessa concluded that there is a high level of awareness of PCOS among Saudi women. Educational level and to graduates of health colleges scored higher. Awareness of symptoms was higher than of complications in study done by AlRuthia. [1, 17, 18]

Conclusion

Students with a positive family history are more likely to get PCOS. Excellent level of knowledge regarding PCOS was highly associated with the medical field of the students. Students in medicine had a higher general score than those in pharmacy, nursing, respiratory therapy and anesthesia. There is no statistical relationship between age marital statues and the occurrence of PCOS. The results showed a significant difference between the BMI of those with PCOS in comparison to those without PCOS; PCOS participant were obese and overweight compared to non PCOS.

Recommendation

1. We recommend early screening programs in Saudi Arabia, to detect the syndrome among female teenagers with family history.
2. Healthcare providers should know more about polycystic ovarian syndrome because it is a crucial condition in our society
3. Future studies with hospital-based study and larger sample size on PCOS are needed for greater understanding of the manifestation of PCOS in the Saudi population.

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References

1. Alessa A, Aleid D, Almutairi S, et al.: Awareness of Polycystic Ovarian Syndrome among Saudi Females. *Int J Med Sci Public Health*. 2017, 6:1013-1019. 10.5455/ijmsph.2017.0202507022017
2. Bazarganipour F, Ziaei S, Montazeri A, et al.: Psychological investigation in patients with polycystic ovary syndrome. 2013, 11:141-10. 10.1186/1477-7525-11-141
3. Ding T, Hardiman PJ, Petersen I, et al.: The prevalence of polycystic ovary syndrome in reproductive-aged women of different ethnicity: a systematic review and meta-analysis. 2017, 56:96351-96358. 10.18632/oncotarget.19180
4. Sedighi S, Akbari S, Afrakhteh M, et al.: Comparison of Lifestyle in Women With Polycystic Ovary Syndrome and Healthy Women. *Glob J Health Sci*. 2015, 7:228-234. 10.5539/gjhs.v7n1p228
5. Kumarapeli V, Seneviratne R, Wijeyaratne C: Health-related Quality of Life and Psychological Distress in Polycystic Ovary Syndrome: a Hidden Facet in South Asian women. *BJOG*. 2011, 118:319-328. 10.1111/j.1471-0528.2010.02799.x
6. Silfen M, Denburg M, Manibo A, et al.: Early Endocrine, Metabolic and Sonographic Characteristics of Polycystic Ovary Syndrome (PCOS): Comparison between Nonobese and Obese Adolescents.. *Journal of Clinical Endocrinology & Metabolism*. 2003, 88:4682-4688. 10.1210/jc.2003-030617
7. Yildiz B, Knochenhauer E and Azziz R: Impact of Obesity on the Risk for Polycystic Ovary Syndrome. *J Clin Endocrinol Metab*. 2008, 93:162-168. 10.1210/jc.2007-1834
8. Apridonidze T, Essah P, Luomo M, et al.: Prevalence and Characteristics of the Metabolic Syndrome in Women with Polycystic Ovary Syndrome. *Clinical Endocrinology and Metabolism*. 2005, 90:1929-1935. 10.1210/jc.2004-1045
9. Deeks A, Gibson M and Teede H: Anxiety and Depression in Polycystic Ovary Syndrome: A Comprehensive Investigation. Elsevier Inc. 2010, 93:2421-3. 10.1016/j.fertnstert.2009.09.018
10. Joshi B, Mukherjee S, Patil A, et al.: A Cross-Sectional Study of Polycystic Ovarian Syndrome among Adolescent and Young Girls in Mumbai, India. *Indian Journal of Endocrinology and Metabolism*. 2014, 18:317-324. 10.4103/2230-8210.131162
11. Bhattacharya S and Jha A: Prevalence and Risk of Depressive Disorders in Women with Polycystic Ovary Syndrome (PCOS). Elsevier Inc. 2010, 94:357-9. 10.1016/j.fertnstert.2009.09.025
12. Barnard L, Ferriday D, Guenther N, et al.: Quality of Life and Psychological well-being in Polycystic Ovary Syndrome. *Human Reproduction*. 2007, 22:2279-2286. 10.1093/humrep/dem108
13. Hahn S, Janssen O, Tan S, et al.: Clinical and Psychological Correlates of Quality-Of-Life in Polycystic Ovary Syndrome. *European Journal of Endocrinology (EJE)*. 2005, 153:853-860. 10.1530/eje.1.02024
14. Cinar N, Kizilarslanoglu M.C, Harmanci A, et al.: Depression, Anxiety and Cardiometabolic Risk in Polycystic Ovary Syndrome. *Human Reproduction*. 2011, 26:3339-3345. 10.1093/humrep/der338
15. Musmar S, Afaneh A and Mo'alla H: Epidemiology of Polycystic Ovary Syndrome: a Cross Sectional Study of University Students at An-Najah National University-Palestine. *Reproductive Biology and Endocrinology*. 2013, 11:46-48. 10.1186/1477-7827-11-47
16. Khomami M, Tehrani F, Hashemi S, et al.: Of PCOS Symptoms Hirsutism has the Most Significant Impact on the Quality Of Life of Iranian women. *Public Library of Science (PLOS)*. 2015, 10:10. 10.1371/journal.pone.0123608
17. Al-Ruthia Y, Balkhi B, AlGhadeer S, et al.: Relationship between Health Literacy and Body Mass Index among Arab women with Polycystic Ovary Syndrome. *Saudi Pharm J*. 2017, 25:1015-1018. 10.1016/j.jsps.2017.04.003
18. Alsibyani N, Malibary M, Derham A, et al.: Clinical Presentation of Polycystic Ovary Syndrome Among Saudi Arabian Women, Jeddah Saudi Arabia. *International Journal of Advanced Research (IJAR)*. 2017, 3:1872-1876. 10.21474/IJAR01/3704
19. Musmar S, Afaneh A and Mo'alla H: Epidemiology of Polycystic Ovary Syndrome: a Cross Sectional Study of University Students at An-Najah National University-Palestine. *Reproductive Biology and Endocrinology*. 2013, 11:46-48. 10.1186/1477-7827-11-47
20. Khomami M, Tehrani F, Hashemi S, et al.: Of PCOS Symptoms Hirsutism has the Most Significant Impact on the Quality Of Life of Iranian women. *Public Library of Science (PLOS)*. 2015, 10:10. 10.1371/journal.pone.0123608
21. Al-Ruthia Y, Balkhi B, AlGhadeer S, et al.: Relationship between Health Literacy and Body Mass Index among Arab women with Polycystic Ovary Syndrome. *Saudi Pharm J*. 2017, 25:1015-1018. 10.1016/j.jsps.2017.04.003
22. Alsibyani N, Malibary M, Derham A, et al.: Clinical Presentation of Polycystic Ovary Syndrome Among Saudi Arabian Women, Jeddah Saudi Arabia. *International Journal of Advanced Research (IJAR)*. 2017, 3:1872-1876. 10.21474/IJAR01/3704