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Risk factors of Polycystic ovarian syndrome

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Thanks to our diligent group who all give their hard work in this research.

Abstract

Introduction:

Polycystic Ovary Syndrome (PCOS) is a common reproductive health problem among women worldwide. It is associated with androgen excess, anovulation, abnormal menstruation, and sub-infertility. Other manifestations of PCOS are acne, abnormal hair growth, alopecia, and male-pattern baldness

Materials and Methods:

Study population: The study was performed on (303) female recruited from patients in the Infertility Center at Al Nassiriya hospital , Thi -Qar ,Iraq.

All cases regarded as PCOS patients met the diagnosis criteria of PCOS published by the Iraqi Ministry of Health, which defines a PCOS patient as one who must have symptoms of oligomenorrhea and amenorrhea or abnormal uterine bleeding as well as one of the two following symptoms: hyperandrogenism and polycystic ovaries. Other cause of hyperandrogenism and polycystic ovaries must be excluded to make the diagnosis. Patients with malignant tumor, cardiovascular disease, server organic disease, and psychiatric issues were excluded from the sample.

Type of study: cross-section study.

Results:

The mean age of women was 26.23 (± 4.88) with height and weight 160.05 (± 8.42) and 63.96 (± 13.05) respectively. Also, the mean menarche age was 12.69 (± 1.474). The majority of women was medical doctor 153 (50.8%) and college student 113 (37.54%). Most of them graduated 179 (59.46%). Among these women only 118 (38.9%) have PCOS. And most of them believe that the diagnosis of PCOS done by ultrasound 112 (37.0%).

Conclusion:

Based on this study, we conclude that here is no statistically significant difference between "No PCOS group" and "PCOS group" in the number of pregnancies. No statistically significant difference in menarche age. Frequency of MC was higher regular among "No PCOS group" and there is statistically significant difference between "No PCOS group" and "PCOS group". And when comparison between both group in diet system which around the significant value. There is no statistically significant difference between "No PCOS group" and "PCOS group" in daily activities, depression, stress or nervousness, Family history of PCOS (mother or sister), diabetes Mellitus, and history of mother MC. On the other hand, family problems and family history of DM were significant difference among both groups.

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Introduction

Polycystic Ovary Syndrome (PCOS) is a common reproductive health problem among women worldwide. It is associated with androgen excess, anovulation, abnormal menstruation, and sub-infertility. Other manifestations of PCOS are acne, abnormal hair growth, alopecia, and male-pattern baldness. Women with PCOS are more likely to develop many metabolic and reproductive health consequences that include miscarriage, gestational diabetes, hypertensive disorders, preeclampsia, prediabetes, type 2 diabetes, cardiovascular disease, stroke, chronic kidney disease, renal failure, breast cancer, endometrium cancer and others [1].

Risk factors is related to genetic and health behaviors. Research evidences reveal many gene loci have been linked with development of PCOS. Familial history of PCOS and health impacts are known. Further research on genome, transcriptome, proteome, and metabolome should be investigated in order to explore and suggest specific preventive strategies [2].

Unhealthy behaviors resulting in overweight, obesity, insulin resistance, hyperinsulinemia, and hyperandrogenism are also known to be risk factors for development of PCOS among women. Over consumption of diets and drinks containing high rich in sugar, fructose, transfat, animal fat, and processed foods are considered its leading causes. Modification of healthy dietary patterns containing natural nutrients and low glycemic index food items are recommended to promote metabolic health and prevention of obesity, insulin resistance and PCOS pathogenesis. Doing regular exercise would be additional effective prevention approach to promote insulin sensitivity and improve PCOS manifestations [3,4]. Lastly, metabolic health literacy and proactive health education should be advised and implemented among women and their families in order to raise their awareness and motivation to engage in preventive action and early detection of PCOS

symptoms. Diagnosis is usually made when a patient has two of three main features, or their associated phenotypes, that include hyperandrogenism, polycystic ovaries and anovulation [5].

Polycystic ovary syndrome remains an underdiagnosed condition [7] despite the fact that it represents the most common endocrine syndrome in women of reproductive age [8-11]. The present study aims to assess risk factors of polycystic ovarian syndrome.

Subject and methods

Study population: The study was performed on (303) female The study was performed on (303) female recruited from patients in the Infertility Center at Al Nassiriya hospital , Thi -Qar ,Iraq.

All cases regarded as PCOS patients met the diagnosis criteria of PCOS published by the Iraqi Ministry of Health, which defines a PCOS patient as one who must have symptoms of oligomenorrhea and amenorrhea or abnormal uterine bleeding as well as one of the two following symptoms: hyperandrogenism and polycystic ovaries. Other cause of hyperandrogenism and polycystic ovaries must be excluded to make the diagnosis. Patients with malignant tumor, cardiovascular disease, server organic disease, and psychiatric issues were excluded from the sample.

Work time : work is done during the period from 1st Feb 2022 until the end of Apr 2022.

Sampling Procedure: Our team selected groups from different ages and backgrounds to get more number of clients with different categories of demographic data .

Questionnaire: The questionnaire used to collection data designed in an Arabic language..

Data Analysis and Presentation: All data management and analyses were done by using the programmed statistical methods. Data have been represented by a suitable tables and figures.

Results

Table 1. Demographic data for the study participants

Demographic data	N (%) OR Mean (± SD)
Age	26.23 (± 4.88)
Hight	160.05 (± 8.42)
Weight	63.96 (± 13.05)
Menarche age	12.69 (± 1.474)
Occupation	
○ College Professor	1 (0.33%)
○ College student	113 (37.54%)
○ Employee	24 (7.97%)
○ Engineer	2 (0.66%)
○ Housewife	5 (1.66%)
○ Medical assist	3 (0.99%)
○ Medical doctor	153 (50.8%)
Educational status	
○ College student/secondary	116 (38.53%)
○ Graduate	179 (59.46%)
○ Secondary	6 (2%)
PCOS	
○ YES	118 (38.9%)
○ NO	185 (61.1%)
Diagnosis of PCOS	
○ Ultrasound	112 (37.0%)
○ Delayed MC	15 (5.0%)
○ Hormones	20 (6.6%)
○ Appearance of coarse hair in unwanted places	18 (5.9%)

Table 1 shows the demographic data for the study participants. The mean age of women was 26.23 (± 4.88) with height and weight 160.05 (± 8.42) and 63.96 (± 13.05) respectively. Also, the mean menarche age was 12.69 (± 1.474). The majority of women was medical doctor 153 (50.8%) and college student 113 (37.54%). Most of them graduated 179 (59.46%). Among these women only 118 (38.9%) have PCOS. And most of them believe that the diagnosis of PCOS done by ultrasound 112 (37.0%).

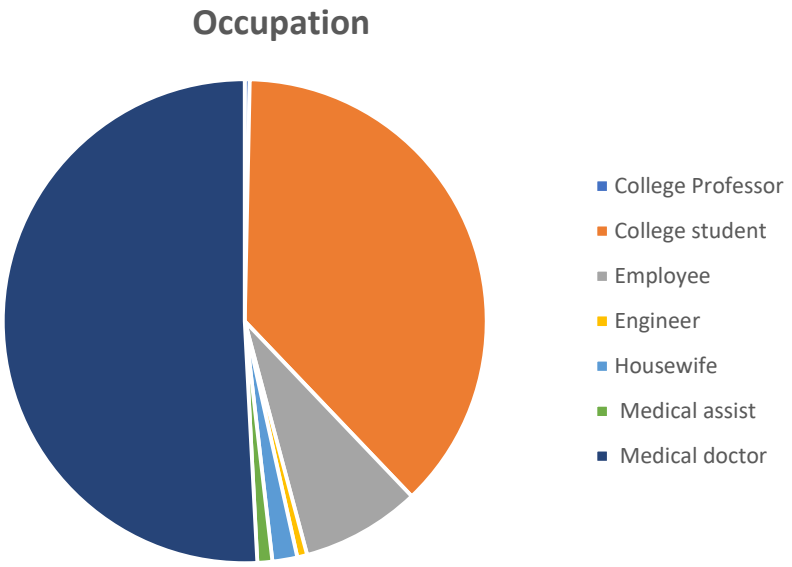

Figure 1 represents the occupation status. The majority of women was medical doctor 153 (50.8%) and college student 113 (37.54%).

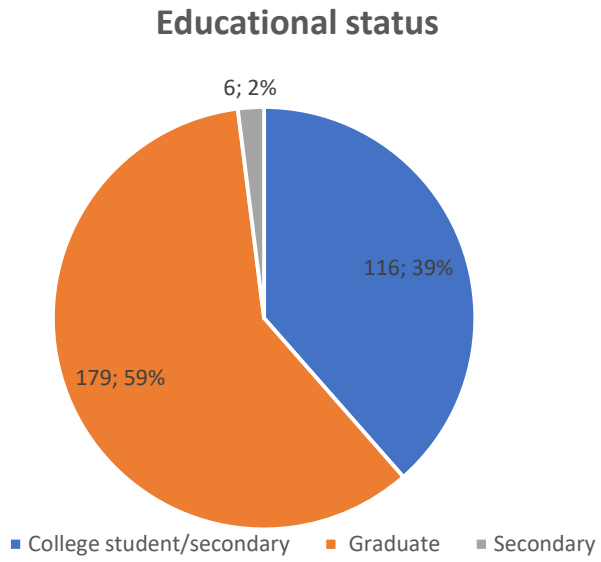

Figure 2 represents the educational status of women. Most of them was graduated 179 (59.46%)

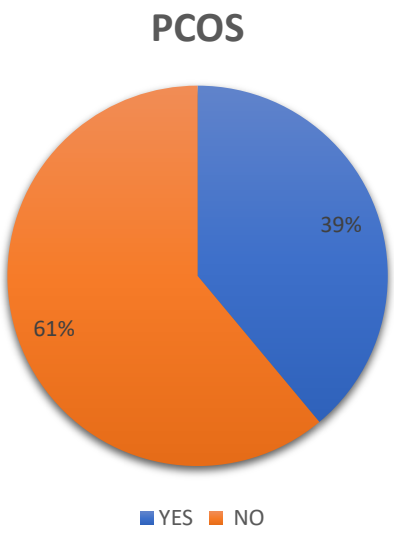

Figure 3 shows frequency of women who have PCOS. Among these women only 118 (38.9%) have PCOS.

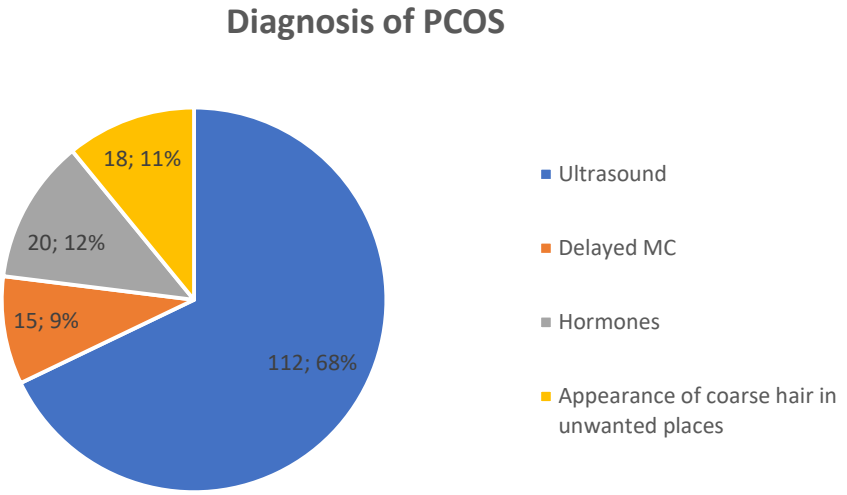

Figure 4 represent the diagnosed of PCOS. Most of them believe that the diagnosis of PCOS done by ultrasound 112 (37.0%)

Table 2 comparison of Body Mass Index, Occupation, Educational status, and Marital state in terms of incidence of PCOV.

Factors		PCOS		P-value
		No PCOS	PCOS	
Body Mass Index	Normal	102	47	**<0.001**
	Overweight	65	46	
	Obese	7	22	
	Morbid obesity	0	2	
	Underweight	6	4	
Occupation	College Professor	1	0	**0.535**
	College student	73	40	
	Employee	17	7	
	Engineer	1	1	
	Housewife	3	2	
	Medical assist	2	1	
	Medical doctor	83	70	
Educational status	College student/secondary	77	39	**0.156**
	Graduate	99	80	
	Secondary	4	2	
Marital state	Unmarried	127	79	**0.335**
	Married	53	42	

The results from table 2 shows that there is statistically significant difference between “No PCOS group” and “PCOS group” in terms of body mass index p <0.001. Also, there is no statistically significant difference between “No PCOS group” and “PCOS group” in Occupation status p = 0.535. Additionally, there is no statistically significant difference between “No PCOS group” and “PCOS group” in educational status and Marital state p value = 0.156, 0.335. respectively

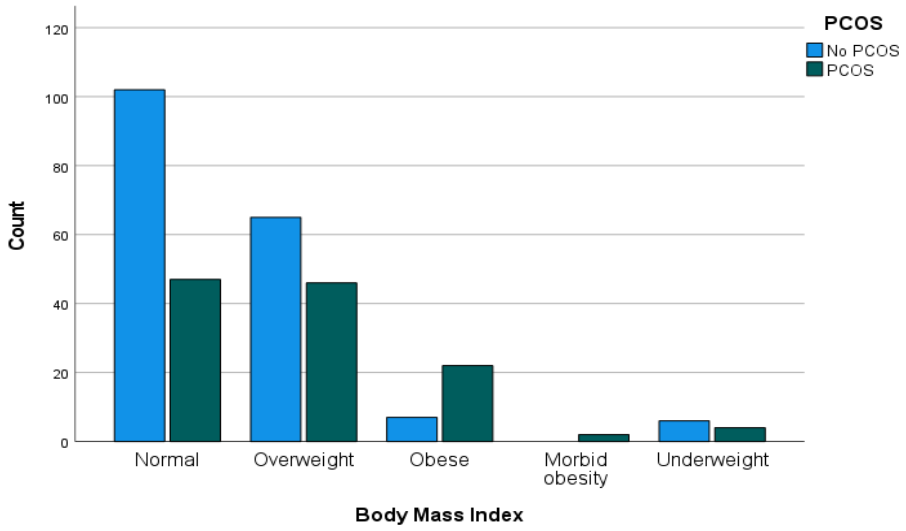

Figure 5 shows the body mass index in comparison if have PCOS or not. there is statistically significant difference between "No PCOS group" and "PCOS group" in terms of body mass index p <0.001

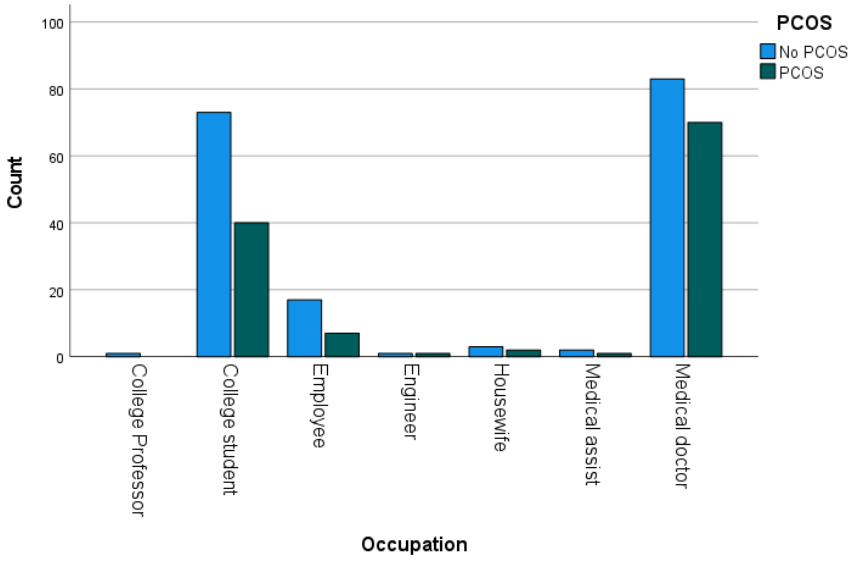

Figure 6 shows the occupation status comparison if have PCOS or not. there is no statistically significant difference between "No PCOS group" and "PCOS group" in Occupation status p = 0.535

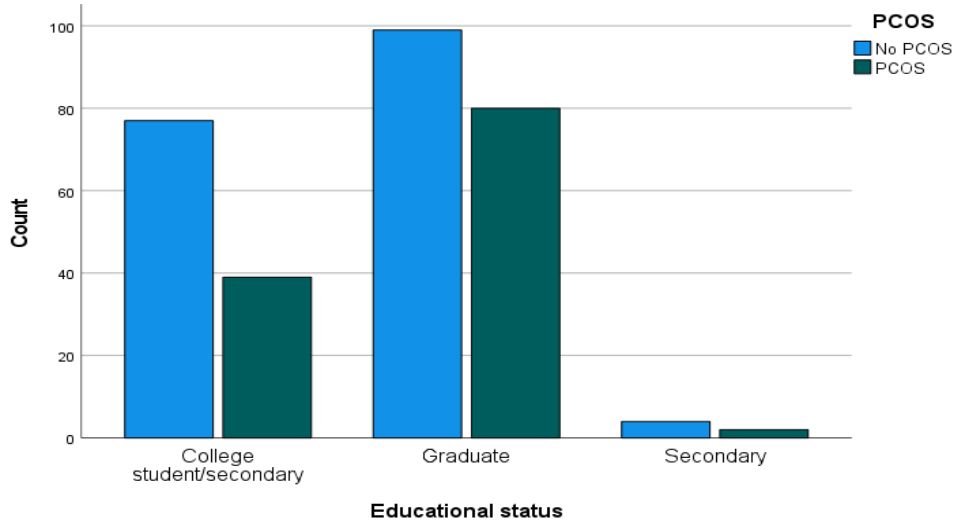

Figure 7 represents the educational status in comparison if have PCOS or not, there is no statistically significant difference between "No PCOS group" and "PCOS group" in educational status p value = 0.156.

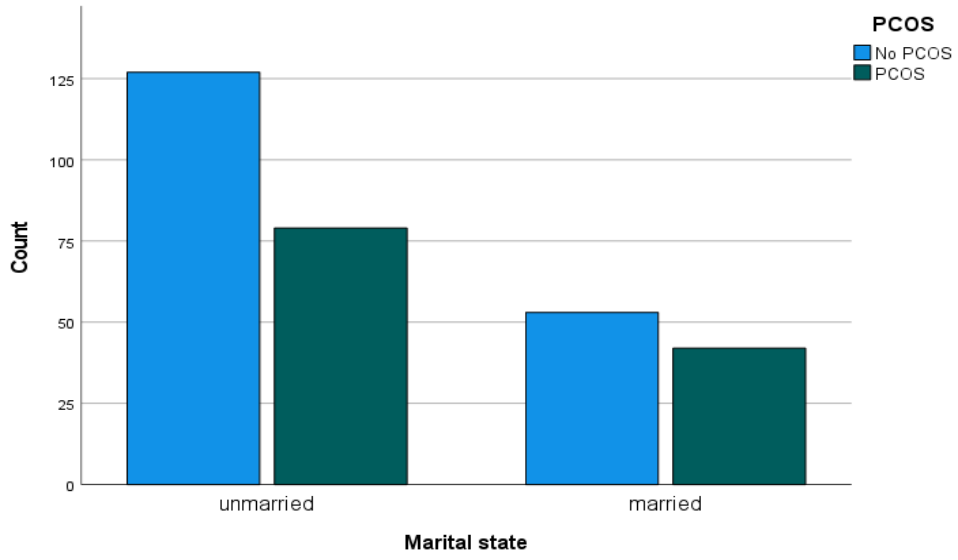

Figure 8 represents the Marital state in comparison if have PCOS or not, there is no statistically significant difference between "No PCOS group" and "PCOS group" in Marital state p value = 0.335.

Table 3. Risk factor of PCOS

Factors		PCOS		P-value
		No PCOS	PCOS	
Number of pregnancies	0	1	0	**0.563**
	1	18	13	
	2	12	14	
	3	10	5	
	4	1	0	
	5	1	0	
	6	3	1	
	None	8	9	
	unmarried	126	78	
Menarche	Up to 12 years	75	60	**0.412**
	At 12-15 years	82	47	
	More than 15 years	20	13	
Frequency of MC	Regular (every 21-35) days	172	68	**<0.001**
	Irregular	5	25	
	Every 2-3 months	1	22	
	Every 6 months and more	0	5	
	5	1	0	
Diet system	Sweats and sugars	82	73	**0.055**
	Stimulants like tea and coffee	42	23	
	Drinking much green tea	7	0	
	Others like "irregular diet, or following specific diet"	30	21	
Daily activities	On regular exercise	11	3	**0.135**
	Active person daily	48	31	
	Home activities and cleaning	54	30	
	Inert and sleep a lot	61	56	
Depression, stress or nervousness		4	0	**0.198**
	No depression, stress or nervousness	14	7	
	Depression, stress and nervousness	162	114	
Family problems	No family problems	127	68	**0.022**
	Having family problems	50	52	
Family history of PCOS (mother or sister)	No family history of PCOS	132	77	**0.176**
	Family history of PCOS	46	43	
Diabetes Mellitus	Not diabetic	176	120	**0.348**
	Diabetic	1	1	
Family history of DM	Negative family history of DM	105	57	**0.026**
	Positive family history of DM	71	64	
History of mother MC	The mother didn't experience irregular MC	142	106	**0.089**
	The mother experienced irregular MC	35	15	

The data from table 3 suggest that there is no statistically significant difference between “No PCOS group” and “PCOS group” in the number of pregnancies p=0.563. No statistically significant difference in menarche age p=0.412. Frequency of MC was higher regular among “No PCOS group” and there is

statistically significant difference between “No PCOS group” and “PCOS group” p<0.001. And when comparison between both group in diet system p=0.055 which around the significant value. There is no statistically significant difference between “No PCOS group” and “PCOS group” in daily activities, depression, stress or nervousness, Family history of PCOS (mother or sister), diabetes Mellitus, and history of mother MC. On the other hand, family problems and family history of DM were significant difference among both groups.

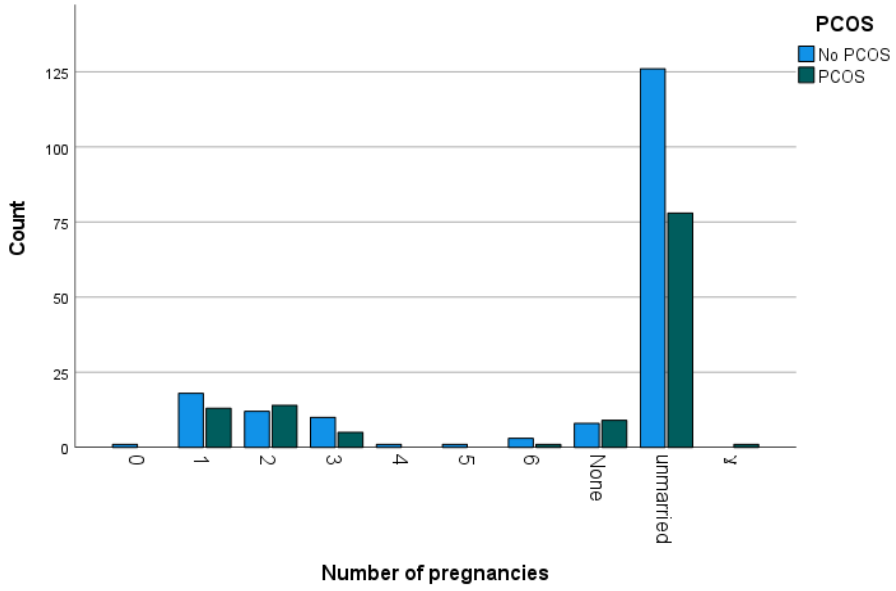

Figure 9 represents the number of pregnancies in comparison if have PCOS or not, there is no statistically significant difference between “No PCOS group” and “PCOS group” in number of pregnancies p=0.563.

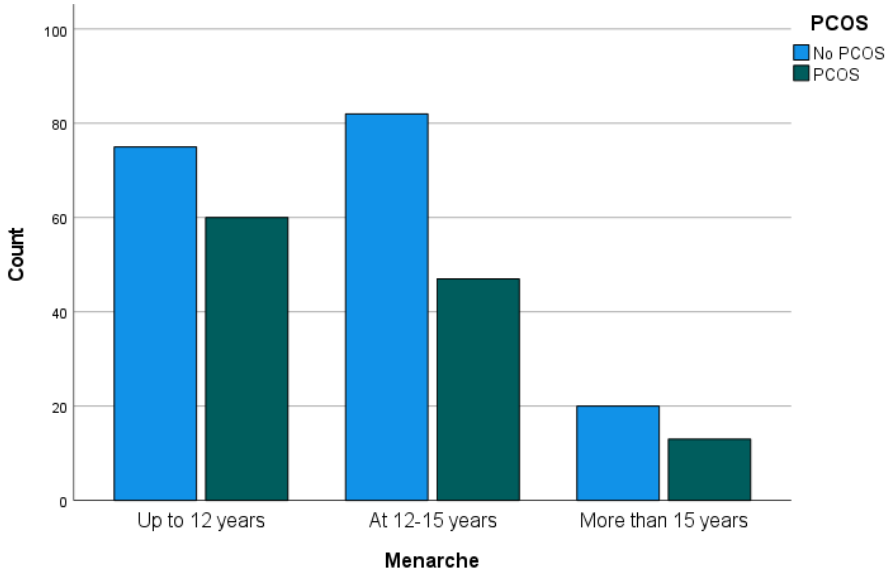

Figure 10 shows the menarche age in comparison if have PCOS or not, there is no statistically significant difference between "No PCOS group" and "PCOS group" in menarche age p=0.412.

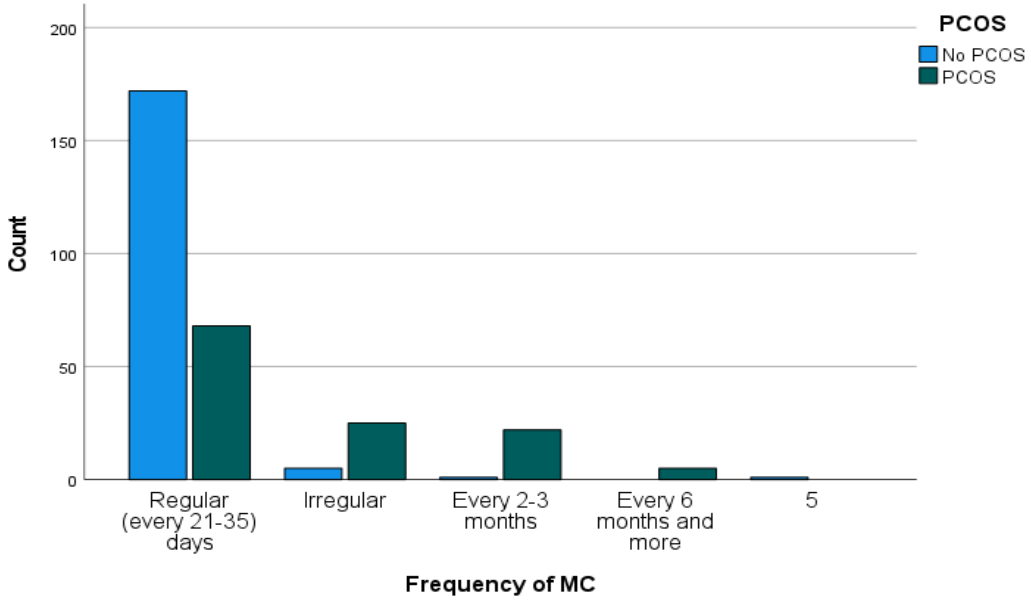

Figure 11 indicate the frequency of MC in comparison if have PCOS or not, Frequency of MC was higher regular among "No PCOS group" and there is statistically significant difference between "No PCOS group" and "PCOS group" p<0.001.

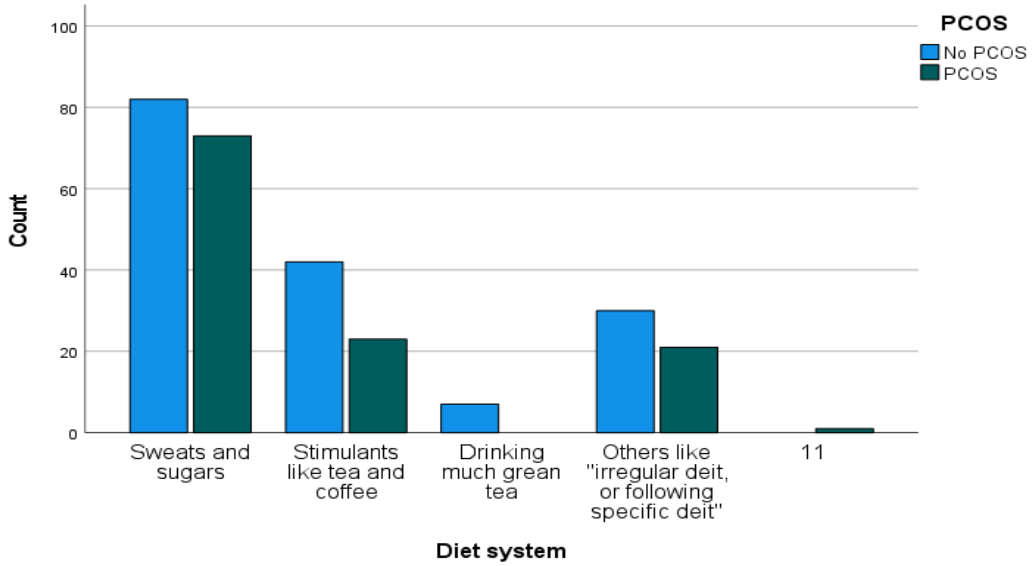

Figure 12 shows the diet system in comparison if have PCOS or not, and when comparison between both group in diet system p=0.055 which around the significant value.

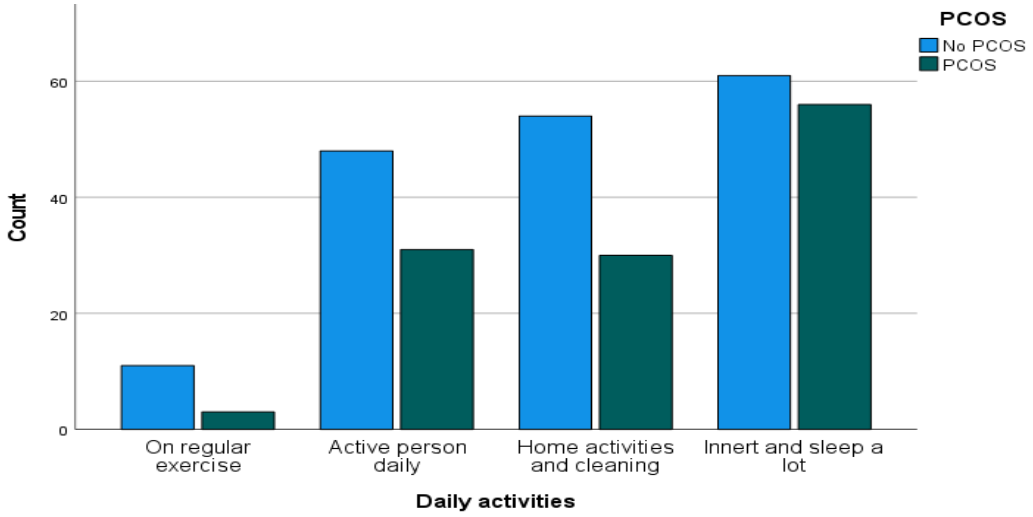

Figure 13 shows the daily activity in comparison if have PCOS or not. There is no statistically significant difference between "No PCOS group" and "PCOS group" in daily activities p=0.135.

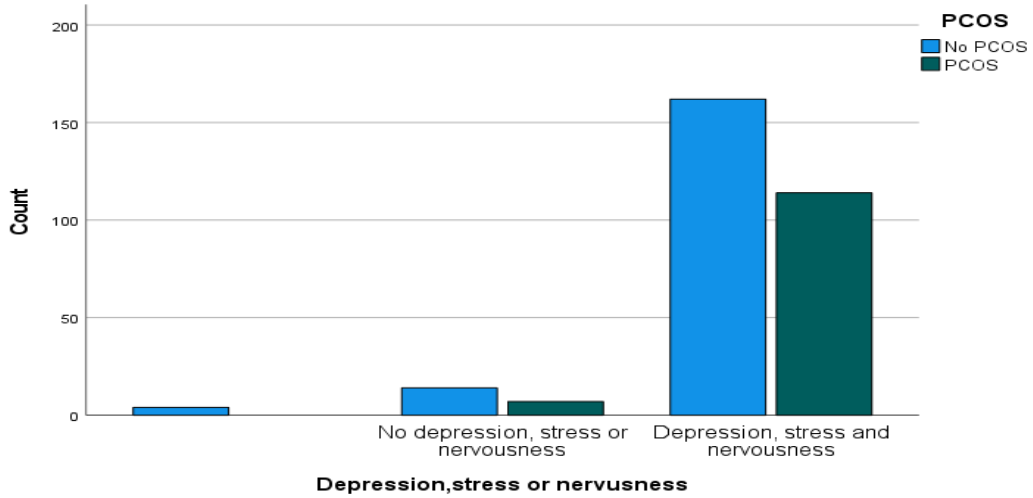

Figure 14 shows the Depression, stress or nervousness in comparison if have PCOS or not. There is no statistically significant difference between "No PCOS group" and "PCOS group" in daily activities.

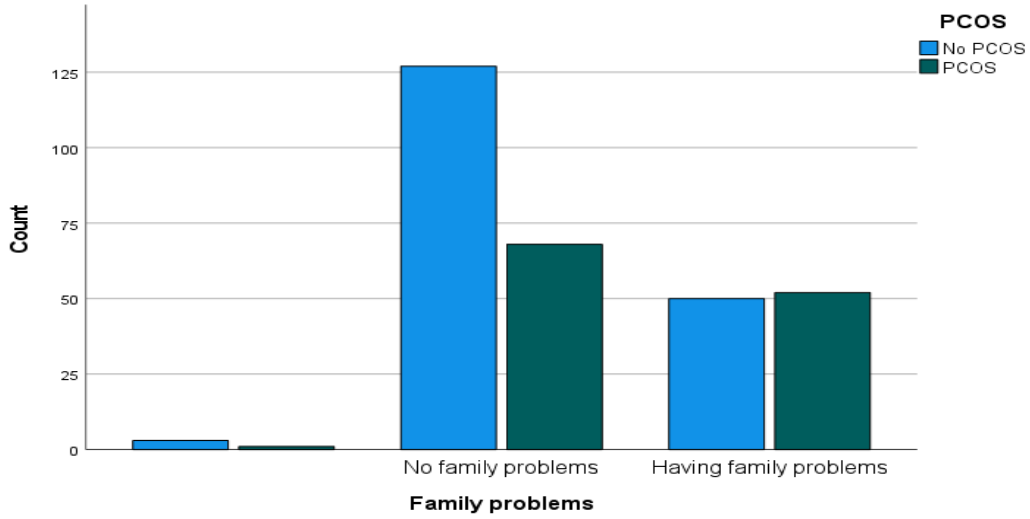

Figure 15 shows the Family problem in comparison if have PCOS or not. There is statistically significant difference between "No PCOS group" and "PCOS group" in daily activities p=0.022.

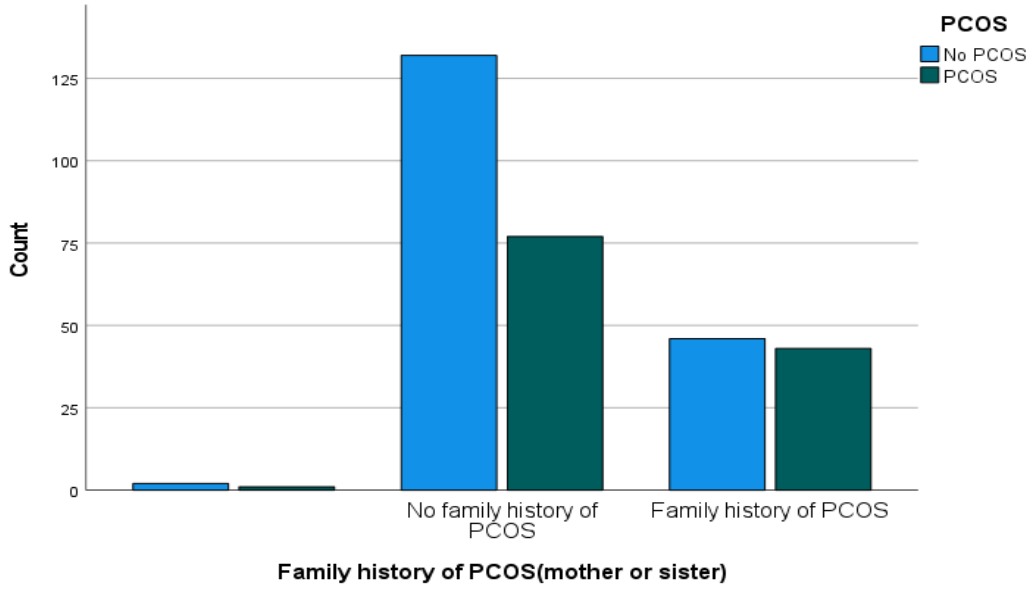

Figure 16 shows the family history of PCOS (mother or sister) in comparison if have PCOS or not. There is no statistically significant difference between "No PCOS group" and "PCOS group" in family history of PCOS.

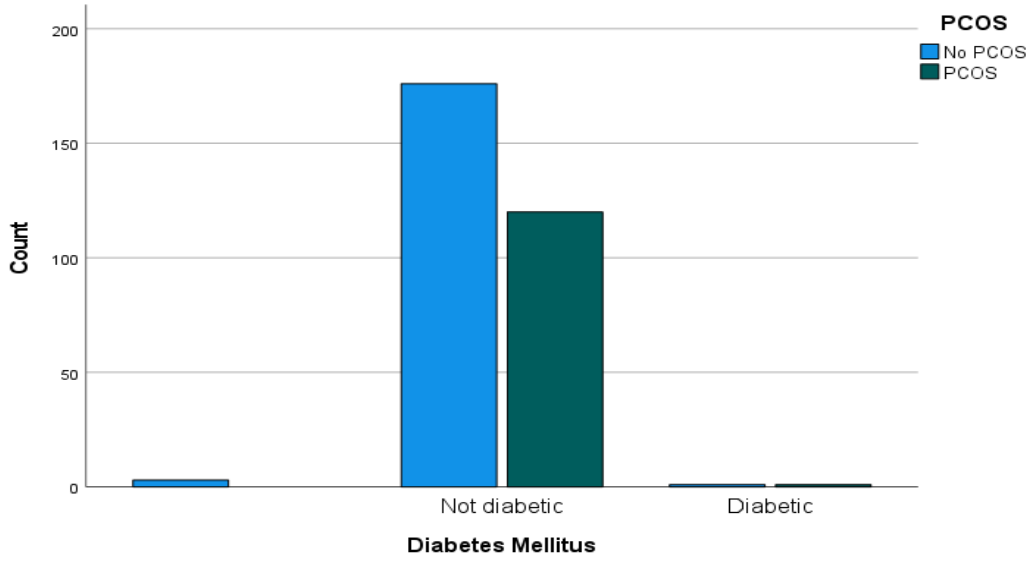

Figure 17shows the diabetes mellitus in comparison if have PCOS or not. There is no statistically significant difference between "No PCOS group" and "PCOS group" in diabetes mellitus.

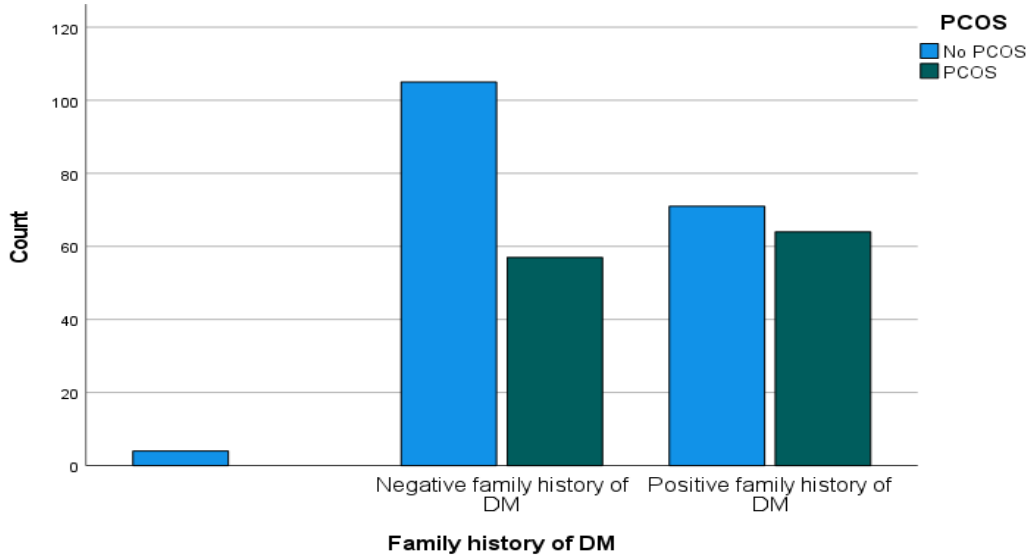

Figure 18 shows the family history of diabetes mellitus in comparison if have PCOS or not. There is statistically significant difference between "No PCOS group" and "PCOS group" in family history of diabetes mellitus p 0.026.

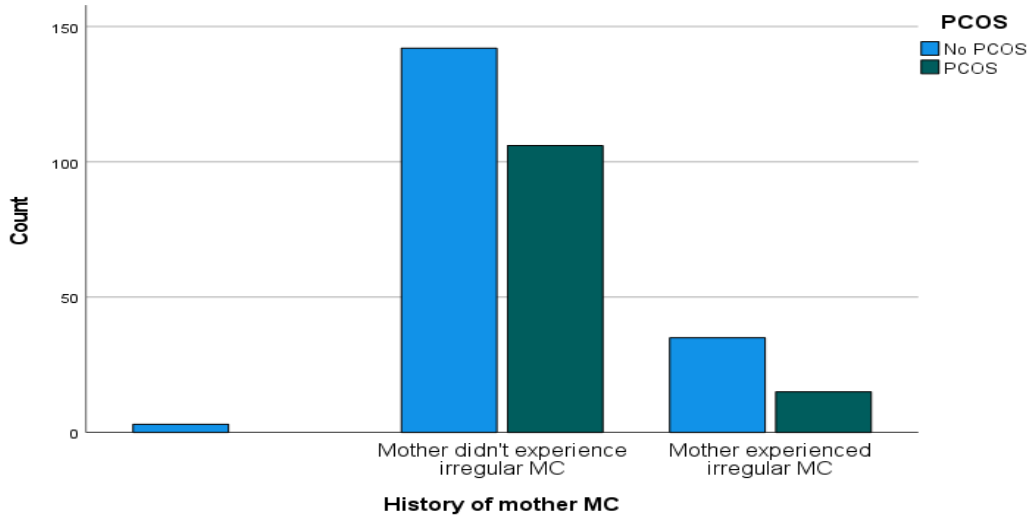

Figure 19 represent history of mother's MC in comparison if have PCOS or not. There is no statistically significant difference between "No PCOS group" and "PCOS group" in history of mother's MC.

Discussion

PCOS, which is characterized by abnormal follicular development, is an endocrine system disorder that has a life-long impact on its patients. PCOS was reported to be prevalent in women of reproductive age at a rate of 5%–10% (Bilal, Haseeb et al. 2018). Oligomenorrhea or amenorrhea, unovulation, insulin resistance (IR), hyperandrogenemia, and ovarian cysts are all symptoms of the disease (Greenwood, Pasch et al. 2018), which is considered one of the primary causes of anovulatory infertility. It has a detrimental effect on women's physical and mental health. PCOS's etiology is unknown, and its prevalence varies according to the genetic characteristics and living environment of its victims.

Due to the complexity of PCOS, the etiology remains unknown. According to one study, it is caused by the interaction of genetic and environmental factors (Legro, Arslanian et al. 2013). Male hormone has been widely recognized as a biomarker for PCOS in recent years due to the fact that PCOS patients share one significant clinical manifestation of hyperandrogenemia. Apart from hyperandrogenemia, PCOS is associated with obesity, insulin resistance, and type 2 diabetes, all of which result in increased ovarian androgen production. Additionally, some studies suggest that adolescent obesity increases the risk of developing PCOS later in life, and that insulin resistance and the resulting hyperinsulinemia may directly or indirectly result in LH secretion, resulting in hyperandrogenemia (Azziz 2018). As obesity has been established as the primary risk factor for type 2 diabetes, there is speculation that obesity, insulin resistance, and hyperandrogenism were all potential risk factors for PCOS.

According to the study's findings, PCOS risk factors include irregular menstruation, a family history of infertility and diabetes, the mother's irregular menstruation, an unpleasant mood, and a lack of physical activity. The majority of PCOS patients develop irregular menstruation during adolescence, and dysregulation of any component of the hypothalamic-pituitary-gonadal axis may result in irregular menstruation and anovulation (J.Y. Du et al.2012). Additionally, our study confirms that PCOS is strongly associated with irregular menstruation. IR was identified as a significant contributor to PCOS in several of our participants, and some studies reported that the prevalence of IR in PCOS patients was as high as 50%–70% (Karakas, Kim et al. 2010). A family history of diabetes, particularly an inherited metabolic disorder, also significantly increases the risk of developing PCOS. This is consistent with finding Roe et al.'s (Roe, Prochaska et al. 2013)(Tian et al. 2014).

Both international and domestic psychological evaluation studies discovered severe mental or psychological disorders in PCOS patients, and it is inferred that an unpleasant mood also increases the risk of PCOS. Xiao et al research described similar findings in this regard (W.H. Xiao et al. 2011). Inactivity, which results in an uneven distribution of body fat, is a significant risk factor for centripetal obesity. One study recommends that obese PCOS patients follow a healthy diet and engage in regular physical activity to significantly alleviate symptoms such as excessive hair and irregular menstruation, and that patients can also expect significant improvement in metabolism and internal secretion after three months of combining medicine with kinesitherapy and personalized nutrition therapy (Le Donne, Alibrandi et al. 2012).

Conclusions

Based on this study, we conclude that here is no statistically significant difference between “No PCOS group” and “PCOS group” in the number of pregnancies. No statistically significant difference in menarche age. Frequency of MC was higher regular among “No PCOS group” and there is statistically significant difference between “No PCOS group” and “PCOS group”. And when comparison between both group in diet system which around the significant value. There is no statistically significant difference between “No PCOS group” and “PCOS group” in daily activities, depression, stress or nervousness, Family history of PCOS (mother or sister), diabetes Mellitus, and history of mother MC. On the other hand, family problems and family history of DM were significant difference among both groups.

Recommendation

Further studies recommended to this issue for more large number of samples to get more accurate results. Primary health care centers and hospitals should pay more attention on this issue to increase women knowledge and attitudes regarding PCOS.

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