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Quality of Life in Normal and Overweight Women with Polycystic Ovary Syndrome: A Cross-Sectional Study

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ABSTRACT

Background & aim: Polycystic ovary syndrome (PCOS) is the most common endocrine disorder in women, which is associated with phenotypic changes, fertility disorders and overweight or obesity. Most of women are concerned about the complications of obesity caused by this disease that can adversely affect their quality of life. Therefore, the present study was conducted to compare the quality of life in normal and overweight women with polycystic ovary syndrome.

Methods: This was a cross-sectional study which performed on 95 normal and 100 overweight women with polycystic ovary syndrome, who attended two hospitals in Urmia, Iran in 2019 and were selected through convenience sampling. Demographic and quality of life questionnaires for polycystic ovary syndrome were used to collect data. Independent sample T test and Chi square test were used to analyze the data.

Results: The mean age of study participants was 26.93 ±5.37 years. The mean score of total quality of life in women with normal weight and overweight was 137.88 ±13.27 and 99.12 ± 22.15, respectively, which was significantly different ($P \leq 0.001$). Also, the mean score of different areas of quality of life questionnaire, except of menstrual disorders, in overweight women were significantly lower than women with normal weight ($P \leq 0.001$). In addition, prevalence of hirsutism in obese women was higher than normal weight women, showing a statistically significant difference ($P \leq 0.001$).

Conclusion: The results showed that weight gain further reduces the quality of life score in women with polycystic ovary syndrome.

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Introduction

Polycystic ovary syndrome (PCOS) is the most common endocrine disorder in women of childbearing age, characterized by chronic anovulation, high androgen levels, inadequate gonadotropin secretion, and abnormal ovarian morphology (1). Clinical disorders include irregular or amenorrhea cycles, hirsutism, acne, and infertility. Also, this syndrome is often associated with metabolic disorders such as: insulin resistance, increased levels of insulin, dyslipidemia, type 2 diabetes and obesity (2).

The prevalence of PCOS is reported to be between 5 and 10 percent worldwide (3) and in Iran the prevalence of this complication is reported to be 14.6 percent (4). While the exact cause of PCOS is unclear, several factors are involved in its pathogenesis, including genetic predisposition, insulin resistance, obesity, chemical and environmental pollution, increased secretion of adrenal hormones in childhood, and psychological stress (4-6).

One of the most Common way used to diagnose PCOS is the presence of at least two of the three clinical-biochemical criteria for Rotterdam, including symptoms of hyperandrogenism, oligomenorrhea, or lack of ovulation, and ultrasound evidence of PCOS (macroscopically, ovarian size in these women is 2 to 5 times the normal size and the ovary

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contains multiple cysts that are typically less than one centimeter in diameter) (7, 8).

There is no definitive cure for this disorder, and changes in the appearance of the disease, such as hair loss, acne, obesity, and sex hormone imbalances, can lead to low self-esteem, impaired social relationships, and impaired marital relationships and sexual function (9, 10).

Some study has shown that the quality of life of women with PCOS is lower than that of healthy individuals and even compared to other gynecological diseases, although the role of biochemical and metabolic factors seems to be effective in reducing the quality of life of these patients. But other issues such as health risks and physical manifestations such as obesity, acne and hair loss or common psychological manifestations such as anxiety and depression can have a negative impact on physical and mental health and consequently reduce the quality of life of this group of women (11-13).

About half of women with PCOS are overweight or obese, the pathogenic role of obesity can affect various mechanisms, the most important of which is hyperinsulinemia, insulin can stimulate ovarian androgen secretion and play an important role in the metabolism of androgens and their transfer to peripheral tissues (14). Therefore, there is a permanent imbalance in the sex hormones of these people, which is exacerbated by obesity. Abdominal obesity in these patients is involved in increasing androgens by increasing estrogen production, reducing the binding of sex hormones to globulins, and increasing blood cholesterol (15). In general, obesity in women causes social problems, stress and sexual dysfunction and reduced quality of life and in obese women with polycystic ovary syndrome, these problems can be more (16).

Due to the high prevalence and serious physical and psychological consequences of this syndrome, which can affect different areas of women's quality of life and considering that most women with polycystic ovary syndrome, suffer from obesity and weight gain and most of these women are concerned about the physical and medical complications of obesity caused by this disease, this study was conducted to evaluate the quality of life in normal and overweight women with polycystic ovary syndrome.

Materials and Methods

The present study was a cross-sectional study that was performed in 2019 on women with polycystic ovary syndrome referred to the gynecological clinics of two hospitals in Urmia, Iran. Convenient sampling was performed among women diagnosed with polycystic ovary syndrome.

The researcher started sampling after receiving the code of ethics from the research vice chancellor of the university and making the necessary arrangements with the officials of the gynecology clinic of Motahhari and Imam Reza hospitals. After identifying the patients with polycystic ovary syndrome (based on having two out of three Rotterdam criteria), researcher gave them the necessary explanations about the study and if the participants agreed to take part in the research and met the inclusion criteria, oral consent was obtained from them and then they were asked to complete the study questionnaires. In addition, participants' height and weight were measured using scales and tape measure to calculate BMI. It should be noted that the questionnaire of 5 normal weight women was excluded from statistical analysis due to incomplete filling of questions.

Inclusion criteria consisted of willingness to participate in the study, age 15 to 45 years, being Iranian, having at least primary education, being married, having at least two of the three diagnostic Rotterdam criteria, absence of cancer or chronic disease (Diabetes, hypertension, kidney disease, heart disease), absence of mental illness, and not taking antidepressants, absence of speech and hearing problems. The patient's own statements were cited regarding the presence of the disease and the use of medications. Exclusion criteria included ffailure to complete the questionnaires.

Demographic questionnaire, quality of life questionnaire in polycystic ovary syndrome and clinical information and clinical examinations included: Rotterdam diagnostic criteria (1), Freeman-Gallow hirsutism measurement system (1) and Global Acne Scoring System (GAGS) (17).

Rotterdam diagnostic criteria: The criterion for diagnosing polycystic ovary syndrome is

three factors. For definitive diagnosis, the presence of at least two of the three factors is necessary. These three factors are as follows: 1. View of polycystic ovaries on ultrasound: the presence of at least 12 follicles in one or both ovaries or ovarian enlargement> 10 ml. 2. Clinical signs of hyperandrogenism such as hirsutism with a score above 7 on the Freeman-Gallow scale , acne and elevated plasma testosterone> 2 nanomoles and, 3. Menstrual interval> 35 days or amenorrhea or diagnosis of no vaginal bleeding for at least 6 months (1).

Freeman-Gallow standard (F / G Score): used to score and diagnose hirsutism and includes assessment of 9 areas of the body and scoring each area from 0 (no hair loss) to 4 (severe hirsutism) Scores range from 0 to 36, and a score of .8 indicates a diagnosis of hirsutism (1).

Acne Scoring Criterion (GAGS**):** It is Used to assess acne and examines pimples in 6 areas of the body, including the face, chest, back, and shoulders, and scores based on the density of Pilobasseus (17).

Quality of Life Polycystic Ovary Syndrome Questionnaire (PCOSQ): It is a special questionnaire that is used to assess the effect of PCOS signs and symptoms on the quality of life of patients with polycystic ovary syndrome. It has 30 items that are divided into: hirsutism (5 questions), emotional problems (8 questions), body weight (5 questions), infertility (4 questions) , menstrual problems (4 questions) and acne (4 questions) and has a Likert scale of one (never) to seven (forever) (18).

The interval between menstruations was asked and recorded in the last 12 months. The height and weight of the study participants were measured by a researcher and a scale with an error of 0.1 kg by the researcher to assess body mass index (BMI).

The amount of body hair (hirsutism) based on the Freeman-Galloway scoring system and acne assessment by the Global Acne Classification System (GAGS) was assessed and recorded by the researcher in the same session.

Validity and reliability of the Polycystic Ovary Syndrome Quality of Life Questionnaire was conducted by Ziaee & et al in 2013 with a Cronbach's alpha coefficient of 0.92 (18).

The sample size was calculated using study by Ali Asghari (2017) and the test power of 90% and the error of 0.05, 91 people in each group, which included **10%** of the sample loss including 100 obese women (body mass index greater than 25) with PCOS and 100 normal weight women (body mass index between 18.5 and 24.9) with PCOS (19).

SPSS19 software was used to analyze the data. The normality of the quantitative variables was investigated by using the Shapiro-Wilks test. To describe the demographic characteristics, the mean and standard deviation (SD) were used for the quantitative variables, and the absolute frequency distribution were used for the qualitative variables. Independent sample T test was used to compare the means of the two groups and Chi square test was used to assess the relationship between frequencies of variables in tow groups. $P<0.05$ was considered as significant. The code of ethics of the present study was IR.UMSU.REC.1397.179

Results

The mean age of study participants was 26.93 ±5.37 years. Most overweight patients had a college degree and most normal-weight patients had a bachelor's degree. 44% of overweight women and 46% of normal weight women had no contraceptive method, and among the contraceptive methods, most patients in each group used oral contraceptive pills. 64% of overweight women and 70% of normal weight women had medium income. Also, 51% of overweight women and 61% of normal weight women had no children. 44% of women with high body mass and 41% of women with normal body mass had been married for 2-5 years.

Hirsutism was higher in overweight women than normal weight women and this difference was statistically significant. Comparison of acne score did not show a significant difference between women in the two groups (Table 2).

Table 1. Frequency of demographic characteristics of normal and overweight women with polycystic ovary syndrome

Variable	High body mass index	Normal body mass index N(95)	P-value*
	Frequency (%)	Frequency (%)	
Education			
High school	25(25)	21(22.1)	P= 0.507 Chi= 1.35
Diploma	33(33)	39(41.1)	
College	42(42)	35(36.8)	
Economic status			
Good	20(20)	12(11.6)	P= 0.25 Chi=4.06
Medium	64(64)	70(73.7)	
Weak	16(16)	13(13.7)	
Number of children			
0	51(51)	61(64.2)	P= 0.12 Chi=5.70
1	27(27)	23(24.2)	
2	20(20)	11(11.6)	
3	2(2)	0(0)	
Duration of marriage (year)			
1-2	16(16)	21(22.1)	P= 0.64 Chi=1.65
2-5	44(44)	41(43.2)	
5-10	28(28)	21(22.1)	
≥10	12(12)	12(12.6)	
Contraceptive method			
No	44(44)	46(48.4)	P= 0.09 Chi=9.29
OCP	33(33)	29(30.5)	
Condom	23(23)	2(2.1)	
IUD	0(0)	2(2.1)	
Vasectomy	0(0)	16(16.8)	

*k2

Table2. The frequency of hirsutism and acne in normal and overweight women with polycystic ovary syndrome

Variable	High body mass index	Normal body mass index	P-value*
Hirsutism			
No	25	72	P ≤ 0.001 Chi=49.91
Yes	71	21	
Acne			
Mild	84	91	P= 0.208 Chi=1.83
Moderate	7	3	

*k2

The mean score of total quality of life in women with normal weight with polycystic ovary syndrome was 137.88 ±13.27 and in overweight women was 99.12 ± 22.15, which was a statistically significant difference between the two groups (P ≤ 0.001). The average scores of quality of life in different areas are given in Table 3.

Table 3. Mean scores of different quality of life domains in normal and overweight women with polycystic ovary syndrome

Variable	Mean± SD	P-value*
Hirsutism		
High BMI	15.05±4.44	P≤ 0.001 t=-12.78
Normal	22.73±3.89	
Emotional status		
High BMI	27.47±6.90	
Normal	39.50±4.44	P≤ 0.001 t=-14.18
Weight		
High BMI	15.37±3.58	
Normal	29.14±2.64	P≤ 0.001 t=-12.78
Infertility		
High BMI	14.06±4.15	
Normal	17.32±4.07	P≤ 0.001 t=-5.281
Menstruation		
High BMI	12.14±4.17	
Normal	11.92±3.30	P=0.69 t=0.399
Acne		
High BMI	16.05±6.24	
Normal	17.22±3.55	P=0.11 t=-1.78

*T-test

Discussion

The aim of this study was to evaluate the quality of life in normal weight and overweight women with polycystic ovary syndrome.

In studies conducted to evaluate the quality of life in women with polycystic ovary syndrome, women with the disease showed a lower average score than healthy women. As the results of some studies showed, these women have a higher score of depression and a lower score of physical satisfaction than healthy women (11, 20). In the present study, the mean total score of quality of life in normal weight women with polycystic ovary syndrome was higher than overweight women, which is a statistically significant difference. In other studies high BMI has been mentioned as an important factor in reducing the quality of life score of women with PCOS (21, 22) . Evidence shows that women with high body mass index show more severe phenotypic symptoms of polycystic ovary syndrome such as acne and hirsutism than women of normal weight.

High body mass index worsens metabolic and reproductive changes, changes in sex hormones and increases androgens, increases menstrual irregularities and increases infertility in obese women with PCOS compared to normal weight women with PCOS (23-25). These issues can further reduce the average score of quality of life in overweight women with PCOS. As the results of the present study showed, the rate of hirsutism in women with high body mass index is higher than women with normal weight. Also in the present study, women with high body mass index scored the lowest average score in all areas of quality of life compared to women with normal weight, except for menstrual disorders and acne, where the average score of

overweight women was slightly higher than women in the other group that this difference was not statistically significant.

The mean score of psychological dimension of quality of life in overweight women with PCOS was lower than women with normal weight with PCOS in study by Panico et al. (2017), the mean score of psychological dimension of quality of life in women with high body mass index with PCOS was lower than women of normal weight, which is consistent with our study. In general, in various studies, obese people who did not have polycystic ovary syndrome had a higher depression score than people of normal weight. Probably one of the main causes of depression in them is dissatisfaction with body image (26, 27), In study done by Castelo-Baranco et al. (2020), women with high body mass index with polycystic ovaries had poor mental body image, low self-esteem, feelings of depression, unattractiveness, chronic mental distress, and mood disorders (28).

Overweight women with PCOS received a lower average score in the weight dimension of the Quality of Life Questionnaire (PCOSQ) than women of normal weight, indicating dissatisfaction with their body weight and concerns about weight gain and its adverse effects on their health, which is in line with the results of the study by Panico et al. (2017)(25).

In the present study, women with high body mass index in the infertility dimension received a lower mean score than women of normal weight, which was a statistically significant difference. The results of the present study are consistent with the results of study conducted by Joham et al. (2016). In that study, mean infertility and pregnancy problems were higher in obese women with PCOS (29).

Also, among the areas of quality of life, menstrual disorders received the lowest mean score among the two groups of women, which is the most important concern for women with polycystic ovary syndrome. In various studies, menstrual disorders are a major problem and an influential factor in the quality of life score of women with PCOS. This indicates that menstruation is probably the most important measure of gender-related health in most women, so that in the one study, menstrual disorders had a significant effect on reducing the quality of life score in women with PCOS (30, 31).

The overall goal of any treatment is to achieve "good health", which according to the World Health Organization corresponds to the concept of mental well-being and good quality of life, and implies a healthy understanding of the body and good communication with oneself. Therefore, increasing the quality of life is the main goal of proper PCOS treatment.

A small number of studies have been performed comparing the quality of life in normal overweight and overweight women with polycystic ovary syndrome in order to compare the findings in the discussion section of the article.

Conclusion

Polycystic ovary syndrome is the most common endocrine disorder in women of childbearing age, which adversely affects various aspects of quality of life in women. The results of the present study showed that increasing BMI worsens the complications of this syndrome and also further reduces the quality of life score in women. Therefore, it is suggested that intervention studies be designed and performed to reduce weight and increase the quality of life of obese women with PCOS. In the treatment plan of these women, weight loss and improving their quality of life should be considered.

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Conflicts of interest

Authors declared no conflicts of interest.

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