



## Original Research

# A Cross-Sectional Investigation of Quality of Life in Patients with Polycystic Ovary Syndrome

Atilla Tekin,<sup>1</sup> Esra Demiryürek,<sup>2</sup> Engin Çakmak,<sup>3</sup> Osman Temizkan,<sup>4</sup> Ömer Akil Özer,<sup>3</sup> Oğuz Karamustafaloğlu<sup>3</sup>

<sup>1</sup>Department of Psychology, Halic University, Istanbul, Turkey

<sup>2</sup>Department of Psychiatry, Sakarya University, Sakarya, Turkey

<sup>3</sup>Department of Psychiatry, Sisli Hamidiye Etfal Training and Research Hospital, Istanbul, Turkey

<sup>4</sup>Department of Gynaecology and Obstetrics, Sisli Hamidiye Etfal Training and Research Hospital, Istanbul, Turkey

### Abstract

**Objectives:** The aim of this study is to investigate the effect of physical signs and comorbid psychopathology on quality of life in women with polycystic ovary syndrome (PCOS).

**Methods:** This cross-sectional study was conducted to assess 84 women with PCOS according to Rotterdam diagnosis criteria. Structured Clinical Interview for DSM-IV Axis 1 Disorders (SCID-I) and the World Health Organization Quality of Life–Brief Form (WHOQOL-BREF) were applied to each participant. The biochemical parameters and physical signs of the participants were evaluated.

**Results:** A negative correlation was found between hirsutism score and physical, psychological, social, and environmental domains of WHOQOL-BREF ( $p=0.023$ ,  $p=0.007$ ,  $p=0.020$ , and  $p=0.033$ , respectively). Furthermore, a negative correlation was found between body mass index (BMI) and psychological domain of WHOQOL-BREF ( $p=0.001$ ). Depression was found to be an important predictor for physical, psychological, and social domains of quality of life ( $p=0.002$ ,  $p=0.001$ , and  $p=0.001$ , respectively).

**Conclusion:** Comorbid depression and high BMI and hirsutism scores decrease the quality of life in women with PCOS.

**Keywords:** Hirsutism; obesity; polycystic ovary syndrome; quality of life.

Please cite this article as "Tekin A., Demiryürek E., Çakmak E., Temizkan O., Özer Ö.A., Karamustafaloğlu O. A Cross-Sectional Investigation of Quality of Life in Patients with Polycystic Ovary Syndrome. Med Bull Sisli Etfal Hosp 2018;52(2):109–113".

Polycystic ovary syndrome (PCOS) is an endocrine pathology observed in 5%–10% of women at the reproductive age. PCOS is characterized by menstrual irregularity, hyperandrogenism, anovulation, and metabolic abnormalities. Even though its etiology is not exactly known, genetic and environmental factors are thought to play a role.<sup>[1]</sup>

PCOS is a pathology that adversely affects the quality of life. Studies have shown that physical signs like obesity and hirsutism particularly influence the quality of life in women with PCOS.<sup>[2, 3]</sup> Furthermore, another factor that decreases the quality of life is the presence of comorbid psychiatric disorders.<sup>[4]</sup> Even though numerous studies investigating

the quality of life of patients with PCOS have been published in the literature, a very limited number of studies have been conducted in the Turkish population.

The purpose of this study was to investigate the correlation of quality of life with physical signs and psychiatric disorders in women with PCOS.

### Methods

#### Sample

We enrolled 145 consecutive patients who visited the General Gynecology Outpatient Clinic in the Department of

**Address for correspondence:** Atilla Tekin, MD. Department of Psychology, Halic University, Istanbul, Turkey

**Phone:** +90 530 123 50 70 **E-mail:** md.atillatekin@gmail.com

**Submitted Date:** October 06, 2017 **Accepted Date:** March 16, 2018 **Available Online Date:** May 21, 2018

©Copyright 2018 by The Medical Bulletin of Sisli Etfal Hospital - Available online at [www.sislietfaltip.org](http://www.sislietfaltip.org)

This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc/4.0/>).



Gynecology and Obstetrics at the Şişli Hamidiye Etfal Education and Research Hospital between May 2014 and December 2014 and were diagnosed with PCOS according to the Rotterdam diagnostic criteria.

The study was completed with 84 patients (33 patients refused to participate in the study; 28 patients did not meet the inclusion criteria).

**Inclusion criteria of the study were as follows:** 1) Being diagnosed with PCOS according to the Rotterdam diagnostic criteria; 2) Being at least primary school graduate; and 3) Being aged 18–45 years and voluntarily participating.

**Exclusion criteria of the study were as follows:** 1) Having an endocrine disease (diabetes mellitus, thyroid function disorders, Cushing's disease, adrenal tumors, and congenital adrenal hyperplasia); 2) Using hormonal drugs, ovulation induction agents, glucocorticoids, antiandrogens, and antihypertensive drugs within the last 6 months; 3) Using psychotropic drugs within the last 3 months; 4) Having a severe neurological disease like dementia; and 5) Being an alcohol or substance addict.

Written consents were received from each patient in the study. This study was approved by the Ethics Committee of the Şişli Hamidiye Etfal Education and Research Hospital.

## Material

**Socio-demographic Data Form:** This form was used to determine the demographic characteristics of participants such as age, educational level, marital status, working condition, height, and weight.

**Structured Clinical Interview for DSM-IV Axis 1 Disorders (SCID-I):** It is a clinical interview that was structured by First et al.<sup>[5]</sup> for DSM-IV axis 1 disorders. Psychiatric disorder in patients is investigated on the basis of "current" and "lifetime." Turkish validity and reliability study of the scale was conducted.<sup>[6]</sup>

**World Health Organization Quality of Life–Brief Form (WHOQOL-BREF):** The scale of quality of life regarding health was developed by WHO and Eser et al.<sup>[7]</sup>; we conducted its validity and reliability study. The scale measures the physical, mental, social, and environmental well-being of patients and comprises 26 questions. As each area independently signifies the quality of life within its own area, the area scores are calculated between 4 and 20. As the score increases, the quality of life increases.

**Hirsutism score:** It was calculated according to the Ferriman-Gallwey scoring system. According to this system, nine anatomic regions (mustache and beard area, chest, breast areola, linea alba, upper back, lower back, thighs, inner sides of femur, and external genital) were evaluated; each area was scored between 0 (no terminal hair growth)

and 4 (maximum hair growth). While scores below 8 were accepted as normal, scores between 8 and 36 were evaluated as pathological and in direct proportion to hirsutism grade.

**Body mass index (BMI):** It was calculated as body weight (kg)/tall stature (m<sup>2</sup>).

**Laboratory values:** Thyroid function and fasting blood glucose (FBG), prolactin, thyroid stimulating hormone, free T<sub>4</sub>, dehydroepiandrosterone sulfate (DHEA-SO<sub>4</sub>), cortisol, insulin, 17-hydroxyprogesterone, estradiol (E<sub>2</sub>), total testosterone (TT), and sex hormone binding globulin (SHBG) levels were examined. Blood samples were collected from women in the early follicular phase between the 3<sup>rd</sup> and 5<sup>th</sup> days of their spontaneous or induced menstrual cycles. Venous blood was collected from the forearm between 08.00 and 10.00 in the morning following a hunger of 8 h. FSH, LH, E<sub>2</sub>, insulin, TT, and DHEA-SO<sub>4</sub> levels were examined with the Cobas® 8000 modular analyzer series Cobas c 602 device in the hormone laboratory using the electrochemiluminescence method. On the other hand, FBG, LDH, HDL, triglyceride, and total cholesterol levels were examined with the Roche Cobas 8000 modular analyzer series in the Roche Cobas c 701 device in the biochemistry laboratory using the enzymatic method. Insulin resistance was determined using the glucose/insulin rate and homeostatic model assessment insulin resistance (HOMA-IR). HOMA-IR was calculated using the following formula: HOMA-IR=FBG (mg/dL)×Insulin (µu/ml)/405. Free androgen index (FAI) that was used to assess free testosterone was calculated using the following formula: FAI=(TT/SHBG)×100.

## Statistical Analysis

Statistical analysis of the data was performed using the SPSS for Windows, Version 16.0. Chicago, SPSS Inc. Socio-demographic data were presented as numbers, percentages, means, and standard deviations. Normality distribution of continuous variables was evaluated using Shapiro–Wilk test. While normally distributed continuous variables were compared using independent samples t-test, continuous variables showing no normal distribution were compared using Mann–Whitney U test. Categorical variables were compared using X<sup>2</sup> test. A multivariate linear regression model was formed for evaluating the correlation between the subscale scores of quality of life and physical signs, accompanying psychopathology and socio-demographic characteristics. Significance of the regression model was tested using analysis of variance. Multicollinearity was checked by calculating tolerance (1/Variance Inflation Factor). All values were >2 and, therefore, deemed as acceptable.<sup>[8]</sup> All statistical comparisons were evaluated according to the significance level of p<0.05.

## Results

Mean age of the patients was 26.39 (SD=5.80) years. Of the 84 patients, 22 (26.2%) were primary school graduates, 19 (22.6%) were secondary school graduates, 28 (33.3%) were high school graduates, and 15 (17.9%) were university graduates. Twenty-nine (34.5%) patients were single, and 55 (65.5%) patients were married; 35 (41.7%) patients were employed, and 49 (58.3%) patients were unemployed. Mean BMI of the patients was 26.72 (SD=6.57) kg/m<sup>2</sup> and mean hirsutism score of the patients was 12.07 (SD=4.13). Of the 84 patients, 45 (53.6%) had normal weight (BMI<25 kg/m<sup>2</sup>), 21 (25%) were overweight (BMI=25.0–29.9 kg/m<sup>2</sup>), and 18 (21.4%) were obese (BMI≥30 kg/m<sup>2</sup>). Twenty-six (31%) patients met the diagnostic criteria for at least one psychiatric disorder. Major depression was the most prevalent psychiatric disorder among the patients (n=20, 23.8%). Other psychiatric disorders among the patients included dysthymic disorder (n=3, 3.6%), obsessive compulsive disorder (n=2, 2.4%), and social anxiety disorder (n=1, 1.2%). There was a significantly negative correlation between BMI

scores and WHOQOL-BREF psychological domain in patients ( $r=-0.342$  and  $p=0.001$ ) (Table 1).

A significantly negative correlation was found between hirsutism scores and all domains of WHOQOL-BREF (physical, psychological, social, and environmental) ( $r=-0.247$  and  $p=0.023$ ;  $r=-0.290$  and  $p=0.007$ ;  $r=-0.253$  and  $p=0.020$ ; and  $r=-0.233$  and  $p=0.033$ , respectively) (Table 1).

A multivariate regression model was created to determine the relationship of each domain of WHOQOL-BREF with physical signs (weight and hirsutism) and comorbid psychiatric disorder and demographic features. The model was found to be significant for each domain of WHOQOL-BREF (for physical domain,  $R^2=0.164$ ,  $F(2.83)=7.971$ ,  $p=0.001$ ; for psychological domain,  $R^2=0.404$ ,  $F(3.80)=18.041$ ,  $p<0.001$ ; for social domain,  $R^2=0.242$ ,  $F(3.80)=8.492$ ,  $p<0.001$ ; for environmental domain,  $R^2=0.054$ ,  $F(1.82)=4.704$ ,  $p=0.033$ ).

A forward stepwise analysis indicated comorbid psychiatric disorder (depression) and hirsutism to be the predictors for WHOQOL-BREF physical and social domains. Comorbid psychiatric disorder (depression), hirsutism, and BMI were the predictors for WHOQOL-BREF psychological domain. Hirsutism was found to be the predictor for WHOQOL-BREF environmental domain (Table 2).

**Table 1.** Correlations between WHOQOL-BREF subscale scores and BMI and hirsutism scores

	Body mass index (BMI)		Hirsutism score (F/G)	
	r	p	r	p
Physical domain	-0.065	0.555	-0.247	0.023
Psychological domain	-0.342	0.001	-0.290	0.007
Social domain	-0.184	0.093	-0.253	0.020
Environmental domain	-0.046	0.675	-0.233	0.033

r: Pearson correlation coefficient; p: statistical value.

## Discussion

The main finding of the present study is that hirsutism and BMI were among the physical signs that negatively affect the quality of life in women with PCOS. Another significant finding of our study was that the quality of life deteriorated in presence of a comorbid psychopathology. According to the results of our study, hirsutism is the only clinical variable

**Table 2.** Stepwise regression analysis of quality of life predictors in women with PCOS

Quality of Life Domain	Predictors	Unstandardized Coefficients		Standardized Coefficients	t	p
		B	SE	Beta		
Physical domain	Depression	2.212	0.699	0.321	3.164	0.002
	Hirsutism score	-0.188	0.079	-0.243	-2.393	0.019
Psychological domain	Depression	3.097	0.556	0.489	5.567	<0.001
	BMI	-0.176	0.063	-0.247	-2.189	0.006
	Hirsutism score	-0.096	0.040	-0.214	-2.398	0.019
Social domain	Depression	2.764	0.799	0.337	3.458	0.001
	Hirsutism score	-0.240	0.090	-0.260	-2.668	0.009
Environmental domain	Hirsutism score	-0.135	0.062	-0.233	-2.169	0.033

Abbreviations: SE; standard error, t: test value, p: statistical value.

with a negative effect on the physical (ability to perform routine tasks, mobility, commitment to treatment), psychological (body image and appearance, self-esteem), social (relations with other people, sexual life), and environmental (forming a pecuniary resource, home activities) areas of quality of life. Hirsute women experience greater emotional problems, have higher levels of anxiety, and face a greater difficulty in social relations than non-hirsute women.<sup>[4, 9-11]</sup> Ching et al.<sup>[11]</sup> stated that hirsutism was associated with deterioration particularly in the psychological sub-area of quality of life and social functionality in women with PCOS. In their study, Hahn et al.<sup>[12]</sup> showed that hirsutism was associated with a decrease particularly in the physical area of quality of life and sexual satisfaction in women with PCOS. In a study conducted on 128 women with PCOS, it was determined that higher hirsutism scores were associated with a depressive or anxious mood and a low self-esteem.<sup>[9]</sup> The results obtained regarding the association between hirsutism and quality of life in our study are similar to those reported in the literature. One of the most important physical signs affecting the quality of life in patients with PCOS is weight.<sup>[13-15]</sup> In a recent study, Benetti-Pinto et al.<sup>[13]</sup> showed that higher BMI values in patients with PCOS were related with a decrease in the physical and psychological areas of quality of life. Hahn et al.<sup>[12]</sup>, on the other hand, stated that increased BMI scores in patients with PCOS were related with a decrease in the physical sub-area of quality of life and in the sexual satisfaction. In the present study, we also determined a correlation between BMI and the psychological sub-area of quality of life in patients with PCOS. On the other hand, we could not find any correlation between BMI and physical sub-area of quality of life, which could be attributed to the fact that patients in our study had lower mean BMI scores than those in other studies. While the mean BMI value of patients in our study was  $26.72 \pm 6.57$  kg/m<sup>2</sup>, this value was  $31.9 \pm 8.5$  kg/m<sup>2</sup> in the study of Benetti-Pinto et al.<sup>[13]</sup> and  $31 \pm 9.3$  kg/m<sup>2</sup> in the study of Hahn et al.<sup>[12]</sup>

According to our results, one of the factors adversely affecting the quality of life in women with PCOS was accompanying psychiatric disorders. We determined that there was at least one psychiatric disorder in approximately one-third of women with PCOS, and the most frequently accompanying psychiatric disorder was major depression. Multivariate regression analysis showed that the comorbidity of depression was associated with deterioration in the physical, psychological, and social sub-areas of quality of life in women with PCOS. A recent internet-based study showed that the comorbidity of depression and anxiety in patients with PCOS negatively affected the quality of life.<sup>[16]</sup> Lipton et al.<sup>[17]</sup> determined a negative correlation between

depression and anxiety levels and all subscale scores of WHQOL-BREF among hirsute women. Thus, in this aspect, the results of our study are consistent with the data in literature.

### Study Limitations

There were some limitations to the present study. Primarily, the fact that it is a cross-sectional study constitutes a limitation in determining a cause and effect relation between the variables. Second, data obtained from patients with PCOS were not compared with a control group. Thus, further research is needed to observe the long-term effects of physical signs and comorbid psychopathology on quality of life in patients with PCOS.

### Conclusion

Both physical signs and comorbid depression in patients with PCOS negatively affect the quality of life. Thus, a multidisciplinary approach toward this patient group may help enhance the quality of life.

### Disclosures

**Ethics Committee Approval:** This study was approved by the Ethics Committee of the Şişli Hamidiye Etfal Education and Research Hospital.

**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** None declared.

**Authorship contributions:** Concept – E.D., A.T., O.K.; Design – E.D., A.T., E.Ç.; Supervision – O.K., Ö.A.Ö.; Materials – O.T., E.D.; Data collection &/or processing – E.D., O.T.; Analysis and/or interpretation – A.T., E.Ç., O.K.; Literature search – A.T., E.D., E.Ç., O.T.; Writing – E.D., A.T., E.Ç.; Critical review – O.K., Ö.A.Ö.

### References

1. Franks S. Polycystic ovary syndrome. *N Engl J Med* 1995;333:853–61.
2. Jones GL, Hall JM, Balen AH, Ledger WL. Health-related quality of life measurement in women with polycystic ovary syndrome: a systematic review. *Hum Reprod Update* 2008;14:15–25.
3. Coffey S, Mason H. The effect of polycystic ovary syndrome on health-related quality of life. *Gynecol Endocrinol* 2003;17:379–86.
4. Podfigurna-Stopa A, Luisi S, Regini C, Katulski K, Centini G, Meczekalski B, et al. Mood disorders and quality of life in polycystic ovary syndrome. *Gynecol Endocrinol* 2015;31:431–4.
5. First MB, Spitzer RL, Gibbon M, Williams JBW. Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I), Clinical Version. Washington: American Psychiatric Press; 1997.
6. Özkürkçügil A, Aydemir Ö, Yılmaz M, Esen Danacı A, Köroğlu E. DSM-IV Eksen I bozuklukları için yapılandırılmış klinik görüşmenin Türkçeye uyarlanması ve güvenilirlik çalışması. *İlaç ve Tedavi Der-*

- gisi 1999;12:233–6.
7. Fidaner H, Elbi H, Fidaner C, Eser SY, Eser E, Göker E. Yaşam kalitesinin ölçülmesi, WHOQOL-100 ve WHOQOL-BREF H. *Psikiyatri Psikoloji PsikoFarmakoloji (3P) Dergisi* 1999;7:5–13
  8. Menard S. *Applied logistic regression analysis*. Sage University Paper Series on Sage; 1995.
  9. McCook JG, Reame NE, Thatcher SS. Health-related quality of life issues in women with polycystic ovary syndrome. *J Obstet Gynecol Neonatal Nurs* 2005;34:12–20.
  10. Moreira Sda N, de Sa JC, Costa EC, de Azevedo GD. Quality of life and psychosocial aspects of polycystic ovary syndrome: a qualitative-quantitative approach. [Article in Portuguese]. *Rev Bras Ginecol Obstet* 2013;35:503-10.
  11. Ching HL, Burke V, Stuckey BG. Quality of life and psychological morbidity in women with polycystic ovary syndrome: body mass index, age and the provision of patient information are significant modifiers. *Clin Endocrinol (Oxf)* 2007;66:373–9.
  12. Hahn S, Janssen OE, Tan S, Pleger K, Mann K, Schedlowski M, et al. Clinical and psychological correlates of quality-of-life in polycystic ovary syndrome. *Eur J Endocrinol* 2005;153:853–60.
  13. Benetti-Pinto CL, Ferreira SR, Antunes A Jr, Yela DA. The influence of body weight on sexual function and quality of life in women with polycystic ovary syndrome. *Arch Gynecol Obstet* 2015;291:451–5.
  14. Coffey S, Bano G, Mason HD. Health-related quality of life in women with polycystic ovary syndrome: a comparison with the general population using the Polycystic Ovary Syndrome Questionnaire (PCOSQ) and the Short Form-36 (SF-36). *Gynecol Endocrinol* 2006;22:80–6.
  15. Guyatt G, Weaver B, Cronin L, Dooley JA, Azziz R. Health-related quality of life in women with polycystic ovary syndrome, a self-administered questionnaire, was validated. *J Clin Epidemiol* 2004;57:1279–87.
  16. Benson S, Hahn S, Tan S, Mann K, Janssen OE, Schedlowski M, et al. Prevalence and implications of anxiety in polycystic ovary syndrome: results of an internet-based survey in Germany. *Hum Reprod* 2009;24:1446–51.
  17. Lipton MG, Sherr L, Elford J, Rustin MH, Clayton WJ. Women living with facial hair: the psychological and behavioral burden. *J Psychosom Res* 2006;61:161–8.