

# Psychological Signs in Patients with Polycystic Ovary Syndrome

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## Abstract

**Objective:** PCOS is a multifaceted disorder with multiple potential risk factors (e.g. infertility, diabetes, cardiovascular disease and metabolic syndrome). PCOS affects quality of life and can worsen anxiety and depression either due to the features of PCOS or due to the diagnosis of a chronic disease. This study aimed to determine the risk factors of PCOS in a group of patients.

**Materials and methods:** In this descriptive-analytic study, 81 patients with PCOS were studied in Vali-e-Asr Reproductive Health Research Center, Tehran, Iran. A questionnaire with items related to stress information was used for data collection. Stress symptoms were assessed using the Understanding Yourself standard questionnaire. Statistical analyses were performed using SPSS 13.0 (SPSS Inc., Chicago, ILL, USA). Data are presented as mean  $\pm$  SD or as frequency with percentages. P-value less than 0.05 were considered as statistically significant.

**Results:** The evaluation of psychological signs in 81 PCO patients and descriptive results showed that 8 (9.9%) had not any stress problem, 32 (39.5%) had neurotic stress, 29 (35.8%) had high level and 12 (14.8%) had extremely high level of stress. The age range of 26 years and more ( $P=0.023$ ), touchy personality ( $P = 0.028$ ) and acne ( $P = 0.015$ ) related with high stress level. The odds of high level of anxiety in women with hirsutism was 3.1 (95%CI 1.00 to 9.59). The odds of high level of obsession in overweight patients was 3.2 (95%CI 1.12 to 9.234). The odds of high level of worrisome in patients with touchy personality was 3.4 (95%CI 1.10 to 11.19). Obsession score had a correlation with illness duration ( $r = -0.268$ ,  $P = 0.038$ ).

**Conclusion:** These data showed that clinical signs of PCOS are the most closely associated with psychological distress and this has important implications for the diagnosis and treatment of disorders.

**Keywords:** Polycystic Ovary Syndrome (PCOS), Hysteria, Anxiety, Worried, Obsession

## Introduction

Polycystic ovary syndrome (PCOS) is a common

female health condition (prevalence= 12%) that is characterized by anovulation, hyperandrogenism and the presence of polycystic ovarian (PCO) morphology (The Rotterdam ESHRE/ASRM-Sponsored PCOS consensus workshop group, 2004) (1). PCOS has a great impact on the lives of women affected, mainly because of the associated problems, such as infertility, hirsutism, acne, obesity, metabolic syndrome, insulin resistance (IR), diabetes,

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dyslipidemia, hypertension and endometrial cancer (Amsterdam ESHRE/ASRM-Sponsored 3rd PCOS Consensus Workshop Group, 2012). Not surprisingly, a high percentage of women report symptoms of depression and anxiety and a diminished quality of life (QoL) (2, 3, 4). Its prevalence among infertile women is 15%–20% (5). In women diagnosed with PCOS, emotional distress could have psychosocial and/or pathophysiological causes (6). Visible features, such as hirsutism and acne, or potential consequences, such as infertility and obesity, are perceived as stigmatizing by many women and could cause distress (7, 8, 9). Causes of PCOS or its physiological consequences could also overlap with the causes of depression. For example, emotional disorders have been linked to hyperandrogenism (10), obesity (11), diabetes (12), metabolic syndrome (13, 14) and low-grade inflammation (15). Hirsutism, menstrual irregularity and infertility have been shown to be the most distressing symptoms in adults with PCOS (16), whereas weight difficulties have been identified as the most distressing symptom in adolescents and young women with PCOS (17, 18, 19). It has been proposed that women with PCOS might be at an increased risk of eating disorders given the propensity for obesity in PCOS. Obesity and, specifically, central obesity, is a common feature of PCOS that worsens the phenotype (20).

The prevalence of depression in PCOS is high (17, 21). Depressive symptoms and mood disorders are common in most obese patients (22). However, there is varying information about the effects of obesity on the risk of depression. Adali and et al., in 2008 showed that, BMI and waist-to-hip ratio (WHR) were significantly greater in patients with PCOS, for whom results also showed highly elevated emotional distress and depression compared to the control group (23). These findings support previous studies indicating that obesity may be a risk factor for psychological distress and depression in patients with PCOS (18, 24, 25). Depression has been associated with increased cortisol levels, increased sympathetic activity and decreased central nervous system serotonin levels, features also associated with insulin resistance (26). Depression is about twice as common in people with diabetes compared with those without it and the treatment of depression can improve glucose control, although this is not a consistent finding (27). Roose et al. in 2007 reported determining the relationship between insulin resistance and psychiatric distress in PCOS (28).

Women with PCOS have clinical and/or biochemical signs of hyperandrogenism. Several studies have shown a correlation between depression and hirsutism. It has been suggested that women with PCOS have a lower self-esteem and a more negative self-image, and have higher levels of depression and psychological distress owing to the physical appearance of hyperandrogenism, including obesity, hirsutism, cystic acne, seborrhea and hair loss, possibly by influencing feminine identity (10, 22, 23, 29). PCOS may not only be induced by psychosocial factors, the main symptoms of PCOS such as infertility, menstrual dysfunctions, hirsutism and obesity cause by themselves increased psychosocial stress (29) and mood dysfunction. Barry and et al in 2011 showed that PCOS patients were significantly more neurotic (had difficulty coping with stress), anxious and depressed than controls (30).

Previous studies showed that PCOS may cause some psychological disorders. The relationships between the psychological health aspects and the clinical characteristics of PCOS are not yet clear. This study was conducted to determine psychological stress of PCOS women also to clarify relationship between PCOS symptom with psychological status in PCOS women.

## Materials and methods

The sample included all women suffering from PCOS visiting Valie-Asr clinic for the first time between February 2010 and April 2011. The diagnosis of PCOS was made according to the joint criteria of the European Society of Human Reproduction and Embryology and the American Society of Reproductive Medicine (ESHRE/ASRM) (31). In this descriptive-analytic study, 81 patients with PCOS were studied with diagnose criteria and age old 20-40 without special disease. Clinical and anthropometric variables, including hirsutism score, body mass index (BMI) and demographic-social questionnaires were used for data collection. This questionnaire included age, education, occupation, duration of illness. The BMI was calculated as weight (kg)/height (m)<sup>2</sup>. Stress symptoms were assessed using the Understanding Yourself standard questionnaire. This questionnaire has been developed by psychologists to provide a comprehensive description of personality. It can be used to rate the personalities of children, adolescents, and adults of any age. Understanding Yourself and Others®: An Introduction to Interaction Styles reveals the four fundamental interaction style

patterns for you to "try on" in your search for understanding yourself (and others). Within these patterns are clues to the "how" of our behaviors. Find out how you consistently seem to fall into certain roles in your interactions with others and how you can shift your energies to take on other roles when necessary. This is a 6 major question and every question has several-item with multiple choice answers as a self-report questionnaire that measures severity of stress. Yourself questionnaire was determined stress in four dimension of anxiety, worried, hysteria and obsession. Stress score was calculated from adding score of each question. And its range was 0 to 60, where a higher total score indicates more severe stress symptoms. Stress scores  $\geq 26$  were considered stress symptoms: Patient with Score lower than 26 have not any stress problem, score 26 to 45 is indicating to neurotic stress, and stress score more than 46 indicate of high level of stress which need to psychological intervention (32). Statistical analyses were performed using SPSS 13.0 (SPSS Inc., Chicago, ILL, USA). Data are presented as mean  $\pm$  SD or as frequency with percentages. Odds ratio of high level of stress (more than 45) for all demographic and symptoms were calculated separately. For calculating adjusted odds ration a logistic regression was used. Then all demographic and symptoms entered to model as independents variable and stress level was chose as dependent. At other step scores of four stress dimension anxiety, worried, hysteria and obsession dichotomized in to high (last quartile) and normal (tree first quartiles). Then separately were chose as dependent variable in a stepwise logistic regression model. Variables which remind in the model were reported. Correlation of stress score with illness duration and age was calculated with Pearson correlation coefficient. P-value less than 0.05 were considered as statistically significant level.

## Results

This study included 81 women with diagnosis of PCOS. Mean age of them was  $27.3 \pm 4.6$  years. PCOS women in this study had been experienced menarche at age  $13.0 \pm 1.4$  years. All of them were married with marriage age about  $19.5 \pm 3.8$  years. Women in this study  $5.9 \pm 4.0$  years suffered from PCOS. Demographic and symptoms of them were presented in table 1.

From 81 women suffering from PCOS 8 (9.9%) patients had not any stress problem, 32 (39.5%) had

neurotic stress level, 29 (35.8%) had high level of stress and 12 (14.8%) of PCOS patients suffering from extremely high level of stress that need to emergency intervention.

**Table 1: Demographics and symptoms of PCOS patients**

		n (%)
Age	Lower than 26	32 (39.5)
	26 and high	49 (60.5)
Education	primary	33 (40.7)
	high school	41 (50.6)
	university	7 (8.6)
BMI	Lower than 26	33 (40.7)
	26 and high	48 (59.3)
Acne	yes	71 (87.7)
	No	10 (12.3)
Hirsutism	yes	45 (55.6)
	no	36 (44.4)
Dysmenorrhea	yes	40 (49.4)
	no	41 (50.6)
Inheritance disease	yes	5 (6.2)
	no	76 (93.8)
Bedridden history	yes	33 (40.7)
	no	48 (59.3)
Sleep	normal	40 (49.4)
	heavy or light	41 (50.6)
Personality	calm	24 (29.6)
	touchy	57 (70.4)
Salary	good	65 (80.2)
	poor	16 (19.8)
Ownership house	personal	19 (23.5)
	rented	62 (76.5)

Unadjusted and adjusted odds ratio based on multivariate logistic regression of high level of stress in PCOS patients were presented in table 2. It was showed that high stress level in women older than 26 years was significantly lower than others (Odds Ratio = 0.245, 95%CI = 0.073 to 0.826). High stress level in PCOS women that presented acne was significantly higher than PCOS women without acne (Odds Ratio = 9.765, 95%CI = 1.563 to 61.005). High stress level also in patient with touchy personality characteristic was significantly higher than other patients (Odds Ratio = 3.920, 95%CI = 1.161 to 13.243). Nagelkerke R square of the logistic regression model was 0.351.

PCOS women in our study had the mean score of anxiety equal to  $8.4 \pm 4.3$ , hysteria  $9.2 \pm 4.5$ ,

obsession  $16.4 \pm 4.7$  and worried equal to  $11.1 \pm 6.2$ . Adjusted odds ratio based on stepwise multivariate logistic regression of high level of different psychological factors in PCOS patients were presented in table 3. From all demographic and symptoms of PCOS just hirsutism was related to anxiety. PCOS woman with hirsutism had high level of anxiety 3.1 (95%CI 1.002 to 9.594) more than others. BMI was only one variable that had a relation with obsession. More than 26 BMI patients had high level of obsession 3.314 (95%CI 1.120 to 9.226) more than others. Personality was only one variable

that affected worried. Woman with touchy personality had high level of worried 3.382 (95%CI 1.022 to 11.194) more than others.

There was a significant correlation coefficient between obsession score and illness duration ( $r = -0.268$ ,  $P = 0.038$ ). Obsession score was greater in the PCOS women with longer duration of illness. Also there was a significant correlation coefficient between age at marriage time and total score of stress ( $r = -0.226$ ,  $P = 0.043$ ). Stress score was greater in the PCOS patients with lower age at marriage time (Table 4)

**Table 2:** Unadjusted and adjusted odds ratio based on multivariate logistic regression of high level of Stress in PCOS patients

	Unadjusted Odds Ratio	Adjusted Odds Ratio	95%CI for Adjusted Odds Ratio		p-value
Age 26 and high	0.558	0.245	0.073	0.826	0.023
Primary education	2.083	1.796	0.169	19.099	0.627
High school education	3.529	7.246	0.688	76.270	0.099
BMI 26 and high	1.745	2.975	0.965	9.169	0.058
Acne	2.687	9.765	1.563	61.005	0.015
Hirsutism	1.563	2.188	0.731	6.547	0.161
Dysmenorrhea	0.640	0.349	0.107	1.137	0.081
Inheritance diseases	1.500	4.430	0.469	41.804	0.194
Bedridden history	1.062	1.503	0.479	4.714	0.485
Heavy or light sleep	1.562	1.883	0.609	5.826	0.272
Touchy personality	0.364	3.920	1.161	13.243	0.028
Poor salary	0.985	0.702	0.185	2.661	0.602
Rented house ownership	1.185	1.814	0.454	7.249	0.399

**Table 3:** Adjusted odds ratio based on separate stepwise multivariate logistic regression of high level of psychological factor in PCOS patients

Dependent variable	Independent variable	Adjusted Odds Ratio	95%CI for Adjusted Odds Ratio		p-value
High Anxiety level	Hirsutism	3.100	1.002	9.594	0.049
High Obsessions level	BMI 26 and high	3.214	1.120	9.226	0.030
High Worried level	Touchy personality	3.382	1.022	11.194	0.046

**Table 4:** Correlation coefficients between stress scores with age and illness duration

		anxiety	hysteria	obsession	worried	Total Score of stress
age	r	0.031	0.165	-0.083	0.017	0.044
	p-value	0.782	0.142	0.459	0.883	0.695
menarche age	r	0.182	-0.134	-0.036	-0.004	-0.007
	p-value	0.124	0.259	0.762	0.970	0.954
marriage age	r	-0.188	-0.113	-0.150	-0.149	-0.226
	p-value	0.092	0.317	0.180	0.185	0.043
Duration of illness	r	-0.048	0.021	-0.268	-0.096	-0.144
	p-value	0.714	0.876	0.038	0.464	0.272



## Discussion

Reproductive function in women with PCOS is strongly depended to body weight and metabolic status. Obesity is associated with an increased risk of infertility and may also have a negative influence on pregnancy outcome (33). Several studies have shown a correlation between psychological distress scores and the levels of serum androgen (34, 35). It has been suggested that women with PCOS have a lower self-esteem and a more negative self-image, and have higher levels of depression and psychological distress owing to the physical appearance of hyperandrogenism, including obesity (10, 24), hirsutism, cystic acne, seborrhea and hair loss, possibly by influencing feminine identity (10, 36, 37). The relationships between the psychological health aspects and the clinical characteristics of PCOS are not yet clear. The present study was undertaken in order to clarify the relationship between increased emotional stress, anxiety symptoms, and the clinical characteristics of PCOS in a group of young patients with PCOS. In present study, because we had not control group, so we try to compare some of effective factors, like demographic (age, education), signs of disease (acne, hirsutism) and economic (salary, ownership house). Data analysis showed that acne and BMI as clinical signs of PCOS are the most closely associated with psychological distress and this has important implications for the diagnosis and treatment of disorders. These data confirms Adali's and Hirschberg's results (23, 33, 38) suggesting that the therapy of PCOS should tackle both physical and psychological complaints. This is because psychological distress reduces motivation, and yet good motivation is the key to agreement with medication and dietary management of PCOS (39, 40). Also these data confirms Barry and et al. on seventy-six women with PCOS and 49 subfertile controls that reported their anxiety, depression and aggression levels. They reported that women with PCOS were significantly more neurotic (had difficulty coping with stress) than controls, had more anger symptoms, were significantly more likely to withhold feelings of anger and had more quality of life problems related to the symptoms of their condition (acne, hirsutism, menstrual problems and emotions) and it was found that women with PCOS were significantly more anxious and depressed than controls (30). The study on PCOS patients in South

Asians shows adversely affects their psychological wellbeing and health-related quality of life. Their psychological distress is related to hirsutism rather than to obesity (41). Indian studies on psychological stress by Goldberg's GHQ 28 (General Health Questionnaire) assessed psychological status, in ninety nine women with PCOS. This psychological study has showed that 72% had obesity, 70% had hirsutism and 72% had a waist circumference >88 cm. All these variables were statistically significant and Indian women presenting with PCOS had increased psychological distress (42).

These results are shown that stress scores with age and illness duration are negatively related and also the evaluating the relations between stress scores with menarche and marriage times in PCOS patients often manifest positive correlation at an age when finding a partner, sexual activity and marriage are important. The associated cosmetic and psychosexual implications are thought to cause profound emotional distress in affected women. Several aspects of the disorder can potentially cause considerable emotional stress. Our results show stress is lower in low marriage age.

Interventions for treatment of clinical symptoms in order to affecting anxiety and depression should be chosen on a case-by-case basis and should be targeted at the main contributors to depression for each woman. For example, effective hair removal in hirsute women has been shown to improve self-esteem (43) and decrease anxiety and depression (44). Similarly, reducing acne via treatments will benefit women who are distressed by this symptom. Treatment of anxiety and depression is considered to have a positive effect on other features of the disorder, including weight management, insulin resistance and endocrine disturbances. These co morbidities should be assessed during depression intervention studies (45). Patients' evaluation by brief questionnaires can be easily applied in the polyclinic; however the most effective way to determine the nature, severity and appropriate therapy for PCOS patients is through consultation with an expert psychologist or psychiatrist. Therefore, we recommend that clinicians be aware of the potential increased emotional distress in women with PCOS and discuss it with their patients. Clinicians should pay attention to the psychosocial dimensions of PCOS on an individual basis, regardless of symptom severity or treatment response. Farther studies are recommended to be designed as analytic surveys

including randomly assigned control group in order to enrich the analytic nature of the study and preclude the confounding parameter of the effect of fertility itself on psychological distress.

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