

## Body Satisfaction and Eating Attitudes among Girls and Young Women with and without Polycystic Ovary Syndrome

Eda Karacan PhD<sup>1</sup>, Gamze Sinem Caglar MD<sup>2,\*</sup>, Aslı Yarci Gürsoy MD<sup>2</sup>, Muserref Banu Yilmaz MD<sup>2</sup>

<sup>1</sup> Department of Psychology, Faculty of Arts and Sciences, Ufuk University, Ankara, Turkey

<sup>2</sup> Department of Obstetrics and Gynecology, School of Medicine, Ufuk University, Ankara, Turkey

### ABSTRACT

**Purpose:** The main goal of the current study was to examine the associations between polycystic ovary syndrome (PCOS) and body dissatisfaction and eating attitudes in a sample of adolescent girls and young women. Body dissatisfaction is 1 of the strongest predictors of the development of negative outcomes such as low self-esteem, and eating disorders. In adolescent age group of patients, both hirsutism and increased body mass index, appearing with PCOS, may be the leading symptoms also resulting or contributing to body dissatisfaction and eating disorder.

**Materials and Methods:** The sample of 94 Turkish adolescent girls and young women [PCOS (n = 42) vs non-PCOS (n = 52)] completed measures of figure rating scale, the socio-cultural attitudes toward appearance questionnaire, body esteem scale, eating attitude test, and demographics.

**Results and Conclusion:** The results revealed that body esteem was important for predicting eating attitudes in both groups and socio-cultural internalization of thinness ideal and body dissatisfaction were also significant factors in PCOS group. However, scores for major study variables (BMI, sociocultural attitudes toward awareness and internalized appearance ideals, body esteem subscales, body dissatisfaction and eating attitudes) in the PCOS group were not significantly higher than those for girls without PCOS.

**Key Words:** Body image satisfaction, Eating attitudes, Polycystic ovary syndrome, Sociocultural attitudes

### Introduction

Body dissatisfaction is defined as a subjective evaluation and the affective component of the multi-dimensional construction of body image. Body dissatisfaction is currently a major health concern and is becoming the norm for children and adolescents.<sup>1</sup> Moreover, it has been shown to be 1 of the strongest predictors for the development of negative outcomes such as depression, low self-esteem, and eating disorders.<sup>2</sup> High levels of body dissatisfaction and weight concerns, linked to disordered eating, occurs at particularly high frequencies during adolescence and early adulthood.<sup>3</sup>

Women diagnosed with polycystic ovary syndrome (PCOS) are usually overweight, or obese.<sup>4</sup> Prevalence of obesity in women who are diagnosed as PCOS, varies in different regions of the world, highest in US and Australia, with a prevalence of 61%-76%.<sup>5,6</sup> There is a clear association between obesity, the development of PCOS, and the severity of its phenotypic, biochemical and metabolic features such as hyperandrogenism, menstrual disturbances, infertility, insulin disturbances and dyslipidemia.<sup>4</sup> Evidence to support this link includes data from epidemiological, pathophysiological, and genetic studies. Additionally, ghrelin, the only known circulating hormone that acts on peripheral and central targets to increase food intake and promote

adiposity, has been found to be associated with insulin resistance in patients with PCOS.<sup>7</sup> Moreover, PCOS is associated with higher central abdominal fat deposits independent of BMI.<sup>8</sup> Additional research is needed to explain the role of ghrelin signaling and associated eating disorders in patients with PCOS.

The psychological aspects of PCOS have received inadequate attention. Women with a PCOS diagnosis have higher levels of psychological morbidities including anxiety, depression, and body dissatisfaction than women without a PCOS diagnosis.<sup>9</sup> The anxiety and depression scores of women with lower BMI diagnosed with PCOS is lower than those of women with higher BMI, but still higher than women without PCOS diagnosis.<sup>9</sup> These findings suggest that obesity alone does not cause the above psychological morbidities in PCOS but is a contributing factor. Additionally, Dokras et al<sup>10</sup> reported that women diagnosed with PCOS have a higher risk of depression and higher depression scores independent of BMI. Understanding the psychological outcomes associated with PCOS has been identified as an important gap in literature.<sup>4</sup>

Compared to healthy peers, not only do patients with PCOS have a higher tendency to gain weight due to metabolic properties of the disease, but they also experience other clinical symptoms of the PCOS such as acne and hirsutism that can decrease body satisfaction and self esteem and predispose to eating disorders. Despite this connection, relatively very few studies have explored disordered eating in patients with PCOS. Michelmore et al<sup>11</sup> investigated the relation between polycystic ovaries and eating disorders.

The authors indicate no conflicts of interest.

\* Address correspondence to: Gamze Sinem Caglar, MD, Ufuk University School of Medicine, Department of Obstetrics and Gynecology, Ankara, Turkey; Phone: +90 532 4418501; fax: +90 312 2847786

E-mail address: [gamzesinem@hotmail.com](mailto:gamzesinem@hotmail.com) (G.S. Caglar).

Although women with PCOS scored more highly for dieting behavior, eating disorder symptomatology, and binge eating episodes than non-PCOS women, the difference was not statistically significant.<sup>11</sup>

The etiology of eating disorders is not fully understood. The sociocultural theory emphasizes that the thin body ideal causes women to adopt “body as object” rather than “body as process.”<sup>12</sup> According to this model, women, and especially adolescent girls, receive consistent messages from their social environment that a very slender physique is attractive and desirable.<sup>2</sup> This hypothesis has received substantial empirical support.<sup>13</sup>

An alternative explanation for the etiology of eating disorders is the social comparison theory, according to which humans have a need to assess their personal characteristics and abilities, and do so by comparing themselves to others.<sup>14</sup> When an unfavorable discrepancy is perceived between self and other, the individual is motivated to adjust his or her behavior in order to minimize the discrepancy.<sup>15</sup> Researchers have hypothesized that eating disorder symptoms may result from maladaptive social comparisons related to appearance. Females who compare their appearance to that of others more frequently experience body dissatisfaction and disordered eating. It has been previously found that women with PCOS have greater body dissatisfaction, even after adjustment for current BMI.<sup>16</sup>

This study was undertaken to explore body dissatisfaction and eating attitudes among patients with and without PCOS in adolescence and young adulthood. We hypothesized that in a normal weight adolescent or young woman the presence of PCOS with associated acne, hirsutism, and central fat deposits, could contribute to body dissatisfaction and abnormal eating attitudes. Therefore, this study was planned to explore body dissatisfaction and eating attitudes among lean young women with and without PCOS.

## Methods

### Participants

The subjects of the study sample were 94 female adolescents and young adults who were diagnosed with PCOS (n = 42) or controls (n = 52). In order to eliminate obesity as a confounding variable, all the participants were lean (BMI < 25) in both groups. Participants ranged in age from 15 to 24 years, with a mean age of 19 (SD = 2.18; Table 1). Diagnosis of PCOS was made according to Rotterdam criteria.<sup>17</sup>

### Procedure

The study protocol was approved by the Ethics Committee of the University Hospital and data for the study were collected through self-report questionnaires from participants at Ufuk University Obstetrics and Gynecology Department in Ankara, Turkey, between January 2009 and February 2010. Before any study procedures, informed consent was obtained from all participants.

### Measures

Participants received multiple questionnaires including measures of figure rating scale, the socio-cultural attitudes towards appearance questionnaire, body esteem scale, eating attitude test, and demographics. The primary outcome variable is eating attitudes (ie, abnormal eating concern), thus all measures were administered for examining sociocultural and psychological predictors of eating disturbance in both groups. The original English versions of the scales were translated into Turkish and a back-translation was done. The accuracy of translation was evaluated by comparing the original and back-translated

**Table 1**  
Descriptive Statistics for All the Study Variables

Variables	PCOS Group (N = 42)			Control Group (N = 52)			Independent sample t-test
	Mean	SD	$\alpha$	Mean	SD	$\alpha$	
<b>Control Variables</b>							
Age	19.1	2.3	-	19.7	2.1	-	1.45
Education	2.5	0.6	-	2.8	0.5	-	2.04*
Perceived SES	2.4	0.7	-	2.4	0.6	-	-0.15
Weight	61.1	10.4	-	58.1	9.8	-	-1.37
Ideal Weight	55.4	5.4	-	53.7	4.9	-	-1.38
Height	165.2	6.1	-	165.1	5.8	-	-0.08
Actual body size (1-7)	4.1	1.4	-	3.4	1.5	-	-1.86†
Ideal body size (1-7)	2.9	0.8	-	2.6	0.9	-	-1.52
<b>Body Mass Index</b>							
BMI (kg/m <sup>2</sup> )	22.4	3.8	-	21.4	3.82	-	-1.26
Body Dissatisfaction	1.23	1.20	-	0.94	1.16	-	-1.20
<b>Sociocultural Attitudes Toward Appearance</b>							
Awareness	12.66	3.26	.78	13.09	3.44	.80	0.62
Internalization	22.26	7.29	.87	22.17	7.29	.88	-0.06
<b>Body Esteem/Body Image Satisfaction</b>							
Appearance	19.38	6.10	.85	19.65	6.44	.88	0.21
Weight	11.59	6.32	.89	13.07	6.30	.91	1.13
Attribution	16.02	4.18	.68	15.48	6.05	.87	-0.49
<b>Eating Attitudes</b>							
EAT	46.66	17.03	.84	48.21	17.55	.86	0.43

PCOS, polycystic ovary syndrome.

\*  $P < .05$ .

†  $P = .06$ .

versions. Discrepancies in meaning were identified and resolved via discussion. Measures relevant to the current study are described below.

#### Figure Rating Scale (FRS)

This measure consists of 9 figure drawings which range from severely underweight<sup>13</sup> to severely overweight.<sup>2</sup> To obtain a body image discrepancy score, participants selected pictures of their “actual” and “ideal” body sizes. Discrepancy scores were calculated by subtracting each participant’s ideal body size from her actual body size. FRS has been utilized in a number of studies, and demonstrates adequate test-retest reliability and concurrent validity.<sup>13</sup>

#### Eating Attitudes Test (EAT-26)<sup>18,19</sup>

This is a 26-item that assesses abnormal eating concern. Participants rated each item using a 6-point Likert scale, where higher scores indicated greater eating disturbances (score range, 0–130). Internal reliability was adequately high in this sample ( $\alpha = 0.85$ ). A higher score indicated more disturbed attitudes for eating.

#### The Sociocultural Attitudes towards Appearance Questionnaire (SATAQ)<sup>20</sup>

The SATAQ is a 14-item questionnaire with 2 subscales that delineate awareness of society’s thinness ideals and the internalization of those ideals. Each question is answered on a 5-point scale that ranges from completely agree to completely disagree. The SATAQ has adequate internal consistency, replicable factor structure, and good convergent validity.<sup>20</sup> High scores on the Awareness subscale indicate familiarity with the thinness ideal, whereas the Internalization scale addresses adoption of that ideal. With the current sample, the Cronbach alpha of the whole scale was 0.87. Subscales alphas were 0.70 and 0.88 for thinness ideal awareness and internalization respectively.

#### Body Esteem Scale for Adolescents and Adults (BESAA)<sup>21</sup>

Body-image satisfaction was measured by the BESAA. The BESAA assesses participants’ attitudes and feelings regarding their bodies and appearance and was designed for individuals from age 12 to 25. Respondents indicate their degree of agreement to 23 questions on a 5-point Likert scale ranging from 1 (never) to 5 (always), and negative items are reverse scored. The scale has 3 subscales: BE–Appearance (general feelings about appearance), BE–Weight (weight satisfaction), and BE–Attribution (evaluations attributed to others about one’s body and appearance). The BES has satisfactory reliability, stability, and validity.<sup>21</sup> In this research, all items loaded on the conceptually appropriate dimension for both PCOS and control group. With the current sample, the Cronbach alpha of the whole scale was 0.90 for PCOS and 0.89 for the control group. Subscale alphas were 0.87, 0.90 and 0.82 for BE–Appearance, BE–Weight, and BE–Attribution respectively for the whole sample.

#### Demographic Measure

This measure asked for socio-economic status, age, grade, and pubertal status. Additionally, the measure requested girls’ self-reported weight (kg) and height (cm).

Finally, participants indicate the household characteristics, including each parent’s educational status and their family size.

#### Data Analyses

First, descriptive analyses were conducted to gather information about the means, standard deviations, and reliability coefficients of the variables. Second, factor analysis were performed in order to see the structure of the scales. Only items with factor loadings of at least 0.32 are considered to be part of a factor.<sup>22</sup> Following the correlational analyses, for the main analysis, hierarchical multiple regression analyses were performed in order to see which variables (ie, socio-cultural attitudes toward appearance, body esteem and body dissatisfaction) significantly predict the eating attitudes (ie, abnormal eating concern) in both clinical and control groups (ie, PCOS and control). The frequency of missing data was relatively small per measure. Therefore, to maintain sample size and reduce sample bias, person-mean substitution for missing data on the scales were utilized. All analyses were conducted by using the Statistical Package for Social Sciences.

## Results

### Preliminary Analysis

Preliminary examinations (ie, means, range, alpha ( $\alpha$ ) values) of the data were conducted in order to describe the data (Table 1). Initial analyses were conducted to assess potential differences between groups (ie, PCOS and control). No differences were observed for parental education, ( $\chi^2(5) = 2.14, P < .82$ ), perceived socioeconomic status, ( $\chi^2(3) = 0.29, P < .96$ ) or estimated household income, ( $\chi^2(3) = 1.28, P < .73$ ), but there was a difference for menstrual cycle, ( $\chi^2(2) = 24.09, P < .01$ ).

The study population consists of adolescents (13–19 years of age) and young adults (emerging adulthood period, 18–25 years of age). Further analyses were performed to see potential differences between adolescents and young women. A significant group effect was observed for only body appearance esteem ( $t = -2.63, P < .05$ ), which is higher in young women subgroup ( $M = 20.87$ ) compared to adolescent subgroup ( $M = 17.00$ ). No other inter-subgroup differences emerged for the main study variables.

### Body Dissatisfaction

All participants completed figure rating scale (FRS) questions on their own ideal and actual body sizes. In order to explore body dissatisfaction in this sample, FRS data on body image discrepancy was first examined. On average, participants with PCOS viewed their actual body as significantly larger ( $M = 4.14, SD = 1.37$ ) than their own ideal body. Similarly, participants in control group viewed also their actual body as significantly larger ( $M = 3.59, SD = 1.49$ ) than their own ideal body. In addition, there was a difference between how groups approached statistical

significance between the 2 groups (ie, PCOS and control) in terms of actual body size ( $t = -1.86, P = .06$ ).

#### Correlations among Observed Variables

As can be seen from Table 2, correlations among the measures of the current study in PCOS group indicated that there was a significant correlation between Eating Attitudes and BMI ( $r = .37, P < .05$ ); SATAQ Awareness ( $r = .33, P < .05$ ); SATAQ Internalization ( $r = .49, P < .01$ ); BE–Appearance ( $r = -.52, P < .01$ ); BE–Weight ( $r = -.38, P < .05$ ) and Body Dissatisfaction ( $r = .42, P < .01$ ). However, in control group Eating Attitudes had only significant correlation between BE–Appearance ( $r = -.56, P < .01$ ) and BE–Weight ( $r = -.29, P < .05$ ).

#### Regression Analysis for Eating Attitudes

A hierarchical regression analysis was performed for both groups (ie, PCOS and control groups) to see whether there was a main effect of body image on eating attitudes. In the first step BMI was entered in order to control for the potential variance accounted for by this variable. Since SATAQ Awareness indicate familiarity with thinness ideal whereas the Internalization taps adoption of that ideal and it was also indicated that the thin internalization has a mediator role between thinness ideal awareness and eating disorder symptoms,<sup>23</sup> awareness entered at the second step and Internalization entered at the third step. Finally, in order to examine the unique contribution of the subscales of body esteem (BE–appearance, weight, and attribution) and perceived body dissatisfaction on eating behavior these variables were entered in the last step. Before the hierarchical multiple regression analysis was performed, the independent variables were also examined for collinearity. Results of the variance inflation factor (VIF) indicated that except for body weight esteem subscale ( $VIF = 3.22$ ), all variables were less than 2.0. Values of VIF greater than 10 is often taken as a signal that the data have collinearity problems.<sup>24</sup> In addition, except for body weight esteem subscale (tolerance = 0.31), collinearity tolerance for all variables greater than 0.51 which suggest that the estimated  $\beta$ s are well established in the following regression model.

As can be seen in Table 3, BMI was entered first and explained 14% of the total variance in PCOS group and 1% of

the total variance in control group. BMI had an independent effect in PCOS group ( $t = 2.53, P < .05$ ). In the second step, SATAQ–Awareness was entered and explained additional 5% of the total variance in PCOS group and 4% of the total variance in control group. But only in PCOS group BMI ( $t = 1.88, P = .06$ ) had a marginally significant effect on eating attitudes. In the third step, SATAQ–Internalization was entered and explained additional 8% of the total variance in PCOS group and 4% of the total variance in control group. Only in the PCOS group, SATAQ–Internalization ( $t = 2.02, P = .05$ ) had a significant effect independent of BMI and SATAQ–Awareness on eating attitudes. In the last step, Body-esteem appearance, Body-esteem weight, Body-esteem attribution and Body dissatisfaction were entered and explained an additional 26% of the total variance in the PCOS group, bringing the total proportion of explained variance to 53%. In the control group, addition of the fourth block explained an additional 39% of the total variance, bringing the total proportion of explained variance to 48%. In the final step, while SATAQ–Internalization ( $t = 2.38, P = .02$ ), Body-esteem appearance ( $t = -2.65, P = .01$ ), and Body dissatisfaction ( $t = 2.47, P = .02$ ) had a significant and body-esteem attribution ( $t = 1.81, P = .07$ ) had a marginally significant effect on eating attitudes in PCOS group, in control group Body-esteem appearance ( $t = -4.19, P = .00$ ) and Body-esteem attribution ( $t = 2.92, P = .00$ ) had a significant and Body-esteem weight ( $t = -1.86, P = .07$ ) had a marginally significant effect on eating attitudes. In sum, our model has accounted for 43% of the variance in Eating Attitudes in PCOS and for 40% of the variance in control group.

#### Discussion

The results of the present study show that in both PCOS and control groups, body esteem subscales are important for predicting eating attitudes (ie, abnormal eating concerns). In addition, sociocultural internalization of thinness ideal and body dissatisfaction are significant predictors of eating attitudes only in patients with PCOS. However, scores for major study variables (ie, sociocultural attitudes toward awareness and internalized appearance ideals, body esteem subscales, body dissatisfaction, and eating attitudes) in the PCOS group are not significantly higher than non-PCOS cases. Thus, our study does not indicate differences between groups.

**Table 2**  
Pearson's Correlations among Observed Variables

Variables	1	2	3	4	5	6	7	8
1. Eating Attitudes (EAT26)	1	.103	.207	.252	-.565 <sup>†</sup>	-.292 <sup>*</sup>	.051	.204
2. Body Mass Index (BMI)	.377 <sup>*</sup>	1	.155	.084	-.365 <sup>†</sup>	-.584 <sup>†</sup>	-.376 <sup>†</sup>	.609 <sup>†</sup>
3. SATAQ Awareness	.337 <sup>*</sup>	.353 <sup>*</sup>	1	.292 <sup>*</sup>	-.176	-.042	-.014	.046
4. SATAQ Internalization	.495 <sup>†</sup>	.472 <sup>†</sup>	.700 <sup>†</sup>	1	-.286 <sup>*</sup>	-.272	-.077	.226
5. BE–Appearance	-.529 <sup>†</sup>	-.566 <sup>†</sup>	-.303	-.402 <sup>†</sup>	1	.521 <sup>†</sup>	.359 <sup>†</sup>	-.429 <sup>†</sup>
6. BE–Weight	-.385 <sup>*</sup>	-.694 <sup>†</sup>	-.280	-.503 <sup>†</sup>	.749 <sup>†</sup>	1	.668 <sup>†</sup>	-.644 <sup>†</sup>
7. BE–Attribution	.038	-.298	.122	-.065	.384 <sup>*</sup>	.479 <sup>†</sup>	1	-.409 <sup>†</sup>
8. Body Dissatisfaction	.423 <sup>†</sup>	.533 <sup>†</sup>	.095	.176	-.559 <sup>†</sup>	-.591 <sup>†</sup>	-.422 <sup>†</sup>	1

SATAQ, sociocultural attitudes towards appearance; BE, body esteem

Correlations above the diagonal are for control; below the diagonal are for Polycystic Ovary Syndrome.

\*  $P < .05$ .

†  $P < .01$ .

**Table 3**  
Summary of Hierarchical Multiple Regression Analysis for Variables Predicting Eating Attitudes in Polycystic Ovary Syndrome (PCOS) and Control Groups

Variable	PCOS Group (N = 42)					Control Group (N = 52)				
	B	SE B	$\beta$	R <sup>2</sup>	$\Delta R^2$	B	SE B	$\beta$	R <sup>2</sup>	$\Delta R^2$
Step I				.14	.12				.01	.01
Body Mass Index (BMI)	1.70	.67	.37 <sup>†</sup>			.47	.66	.10		
Step II				.19	.14				.05	.01
Body Mass Index (BMI)	1.33	.70	.29 <sup>‡</sup>			.33	.67	.07		
SATAQ-Awareness	1.20	.81	.23			1.02	.73	.20		
Step III				.27	.21				.09	.03
Body Mass Index (BMI)	.84	.72	.18			.29	.66	.06		
SATAQ-Awareness	−.13	1.02	−.02			.71	.75	.14		
SATAQ-Internalization	.98	.49	.42 <sup>†</sup>			.51	.35	.21		
Step IV				.53	.43				.48	.40
Body Mass Index (BMI)	−.07	.79	−.01			−1.10	.71	.23		
SATAQ-Awareness	−.68	.92	−.13			.79	.61	.15		
SATAQ-Internalization	1.06	.44	.45 <sup>*</sup>			−.03	.30	−.01		
BE- Appearance	−1.39	.52	−.48 <sup>†</sup>			−1.52	.36	−.56 <sup>*</sup>		
BE- Weight	.70	.62	.26			−1.04	.56	−.37 <sup>†</sup>		
BE- Attribution	1.09	.60	.25 <sup>‡</sup>			1.28	.43	.44 <sup>*</sup>		
Body Dissatisfaction	5.82	2.35	.38 <sup>†</sup>			1.78	2.84	.10		

NSS, Not Statistically Significant

\*  $P < .01$ .

†  $P < .05$ .

‡  $P < .08$ .

Contemporary theories regard body dissatisfaction as the most direct antecedent to the development of eating disorders. In this study, FRS data supported the idea that both PCOS and non-PCOS groups idealize very slender body shapes. Thus, both groups of our study show similar attitude towards their bodies (ie, they viewed their actual body as significantly larger than their own ideal body). Furthermore, body image discrepancy is not limited to overweight girls, but even normal weight adolescent girls desire to be thinner which in turn results in body dissatisfaction. During adolescence and young adulthood, many subjects experience increased dissatisfaction with physical appearance, in part, because normative physical changes such as weight gain at puberty are at odds with socially-prescribed and internalized physical attractiveness ideals.<sup>25</sup> Therefore, absence of significant difference between the groups of this study, may be due to the same attitudes toward their bodies or to a sample size too small to detect a difference. Moreover, the developmental transition period (ie, adolescence and young adulthood) itself rather than PCOS could lead to body dissatisfaction.

Although women with PCOS may have clinical features which could make them more sensitive to body dissatisfaction, sociocultural predictors equally affect adolescents and young women who are diagnosed as PCOS or not. Thus, greater media exposure to the thinness ideal was directly linked with more eating disorder symptoms.<sup>12</sup> Harrison<sup>26</sup> also found a link between thinness ideal media exposure, body-related self discrepancies, and disordered eating among both adolescent and college-age matched samples. Moreover, Stice and his colleagues<sup>12</sup> also revealed that, among young college women greater media exposure had direct effect on eating disorder symptoms, stronger internalization of the ideal-body and also indirect effect on greater body dissatisfaction. Our results indicate that women's internalization of sociocultural standards of 'female beauty' equally affect adolescent and young adult women with normal weight regardless of having PCOS.

In the current study, internalization of the thinness ideal in body dissatisfaction seems to be associated with eating attitudes in only participants with PCOS but not in the control group. Thus, internalization of the thin Western ideal was more important predictor of eating attitudes in PCOS group. Therefore, although there were no differences between groups in terms of major study variables, there was a slight tendency of vulnerability for internalization of thinness ideal in PCOS group. Future research might explore the contribution of various factors in predicting thinness ideal internalization in this population, such as social comparison<sup>27</sup> and social support<sup>28</sup> since both are also related with the risk for developing eating disorders.

Ghaderi<sup>28</sup> found that lower perceived support from the family increased the risk for developing eating disorders in later life. In the current study, while 26.9% of the PCOS sample indicated their dissatisfaction of support from their family and environment, only 8.5% of the control group indicated their dissatisfaction.

Body esteem is also important in body image research, because how people look to others, or at least how people assume that they look to others, may help form their opinions about themselves.<sup>21</sup> According to our results, body esteem was a significant predictor for eating attitudes. Especially, the appearance esteem subscale which measure the general feelings about appearance was an important predictor for eating attitudes in both groups. Moreover, the attributional aspect of body esteem (ie, the evaluations attributed to others about one's body and appearance) was critical in both groups but it was found to be much more important in control group than PCOS group.

There are a number of limitations that should be considered when interpreting the results of the study. Since our samples represented only a limited part of the whole population, the findings cannot be generalized. Additionally, selection bias can be suspected, because, participants of the study were recruited from only 1 clinic. Another limitation was that the research was cross-sectional, thus, it is

important to note that the relationships found represent only associations between variables. Because of societal pressure to be thin and the stigma against overweight persons in many parts of the world, future research is needed to explore the factors that predict the body dissatisfaction and eating attitudes in a variety of special vulnerable groups, such as PCOS.

In sum, although there were no significant group differences in terms of major study variables, the current study provides new information regarding predictors of abnormal eating attitudes in adolescent and young adult girls who are diagnosed as PCOS or not. It seems that social comparison and self-discrepancy theoretical frameworks offer reasonable baseline for the vulnerability in this population. Future research should also examine the relationships between body-size perceptions and overall self and further general well-being in this population.

### Acknowledgments

The authors wish to thank all patients for their participation in this study, and all personnel at the obstetrics and gynecology department for their enthusiastic contribution. This study has no financial support.

### References

- Jung J, Forbes GB, Lee YJ: Body dissatisfaction and disordered eating among early adolescents from Korea and the US. *Sex Roles* 2009; 61:42
- Stice E, Whittenton K: Risk factors for body dissatisfaction in adolescent girls: A longitudinal investigation. *Developmental Psychology* 2002; 38:669
- Neumark-Sztainer D, Paxton SJ, Hannan PJ, et al: Does body satisfaction matter? Five-year longitudinal associations between body satisfaction and health behaviors in adolescent females and males. *J Adolesc Health* 2006; 39:244
- Lim SS, Davies MJ, Norman RJ, et al: Overweight, obesity and central obesity in women with polycystic ovary syndrome: a systematic review and meta-analysis. *Hum Reprod Update* 2012; 18:618
- 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
- Glueck CJ, Dharashivkar S, Wang P, et al: Obesity and extreme obesity, manifest by ages 20–24 years, continuing through 32–41 years in women, should alert physicians to the diagnostic likelihood of polycystic ovary syndrome as a reversible underlying endocrinopathy. *Eur J Obstet Gynecol Reprod Biol* 2005; 122:206
- Altuğ Şen T, Koken R, Narıcı A, et al: Homocysteine and ghrelin link with polycystic ovary syndrome in relation to obesity. *J Pediatr Adolesc Gynecol* 2011; 24:211
- Huang ZH, Manickam B, Ryvkin V, et al: PCOS is associated with increased CD11c expression and crown-like structures in adipose tissue and increased central abdominal fat depots independent of obesity. *J Clin Endocrinol Metab* 2013; 98(1):E17
- Barry JA, Kuczmierczyk AR, Hardiman PJ: Anxiety and depression in polycystic ovary syndrome: a systematic review and meta-analysis. *Hum Reprod* 2011; 26:2442
- Dokras A, Clifton S, Futterweit W, et al: Increased prevalence of anxiety symptoms in women with polycystic ovary syndrome: systematic review and meta-analysis. *Fertil Steril* 2012; 97(1):225
- Michelmores KF, Balen AH, Dunger DB: Polycystic ovaries and eating disorders: are they related? *Human Reproduction* 2001; 16(4):765
- Stice E, Schupak-Neuberg E, Shaw HE, Stein RI: Relation of media exposure to eating disorder symptomatology: An examination of mediating mechanisms. *Journal of Abnormal Psychology* 1994; 103:836
- Thompson JK, Heinberg LJ: The media's influence on body image disturbance and eating disorders: We've reviled them, now can we rehabilitate them? *The Journal of Social* 1999; 55:339
- Price WA, DiMarzio MS: Premenstrual tension syndrome in rapid cycling bipolar affective disorder. *J Clin Psychiatry* 1986; 47:415
- Halbreich U, Lemus CZ, Lieberman JA, et al: Gonadal hormones, sex and behaviour. *Psychopharmacol Bull* 1990; 26:297
- Weiner CL, Primeau M, Ehrmann DA: Androgens and mood dysfunction in women: comparison of women with polycystic ovarian syndrome to healthy controls. *Psychosom Med* 2004; 66(3):356
- Rotterdam ESHRE/ASRM-Sponsored PCOS consensus workshop group: Revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome (PCOS). *Hum Reprod* 2004; 19:41
- Smolak L, Levine MP, Thompson JK: The use of the sociocultural attitudes towards appearance questionnaire with middle school boys and girls. *Int J Eat Disord* 2001; 29:216
- Maloney MJ, McGuire JB, Daniels SR: Reliability testing of a children's version of the eating attitudes test. *Journal of the Academy of Child and Adolescent Psychiatry* 1998; 27(5):541
- Heinberg LJ, Thompson JK, Stormer S: Development and validation of the Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ). *Int J Eat Disord* 1995; 17:81
- Mendelson BK, Mendelson MJ, White DR: Body-Esteem Scale for adolescents and adults. *Journal of Personality Assessment* 2001; 76(1):90
- Tabachnick BG, Fidell LS: *Using Multivariate Statistics*. Boston, Allyn and Bacon, 2001, pp 607–651
- Austin JL, Smith JE: Thin ideal internalization in Mexican girls: A test of the sociocultural model of eating disorders. *Int J Eat Disord* 2008; 41:448
- Chatterjee S, Hadi AS: *Regression analysis by example*. New Jersey, John Wiley & Sons, 2006, pp 236
- Striegel-Moore RH, Cachelin FM: Etiology of eating disorders in women. *The Counseling Psychologist* 2001; 29:635c
- Harrison K: Ourselves, our bodies: Thin-ideal media, self-discrepancies, and eating disorder symptomatology in adolescents. *Journal of Social and Clinical Psychology* 2001; 20:289–323
- Thompson JK, Stice E: Thin-ideal internalization: Mounting Evidence for a New Risk Factor of Body Image Disturbance and Eating pathology. *Current Directions of Psychological Science* 2001; 10:181
- Ghaderi A: Structural modeling analysis of prospective risk factors for eating disorder. *Eating Behaviors* 2003; 3:387