



Original Article

Body Dissatisfaction, Depression, and the Role of Self-Esteem & Self-Compassion in Polycystic Ovary Syndrome (PCOS)

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OPEN ACCESS

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Received: 15-04-2026

Accepted: 25-04-2026

Available online: 07-06-2026

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ABSTRACT

Introduction Polycystic Ovary Syndrome (PCOS) is associated with significant physical and psychological challenges, particularly body image concerns and depressive symptoms. This study aimed to examine the relationship between body dissatisfaction and depression in women with PCOS, and to investigate the mediating roles of self-esteem and self-compassion.

Method A cross-sectional study was conducted among 287 women diagnosed with PCOS. Data were collected using a structured self-administered questionnaire, including measures of body dissatisfaction, depression, self-esteem, and self-compassion. Descriptive statistics, Pearson correlation analysis, and multiple regression analyses were performed.

Results The mean age of participants was 18.00 ± 1.25 years, and the mean BMI was 33.38 ± 3.21 kg/m². A high proportion of participants reported body dissatisfaction (68.98%) and depressive symptoms (49.12%). Body dissatisfaction was positively associated with depression ($r = 0.483$, $p < 0.001$) and negatively associated with self-esteem ($r = -0.498$, $p < 0.001$) and self-compassion ($r = -0.504$, $p < 0.001$). Self-compassion showed a strong negative association with depression ($r = -0.599$, $p < 0.001$). Regression analysis indicated that body dissatisfaction significantly predicted depression ($\beta = 8.936$, $p < 0.001$), while self-esteem ($\beta = -0.912$, $p < 0.001$) and self-compassion ($\beta = -0.301$, $p < 0.001$) were associated with lower depression. Mediation analysis revealed partial mediation by both self-esteem and self-compassion.

Conclusion The findings highlight the need for integrated psychological interventions focusing on body image and emotional resilience in the management of PCOS.

Keywords: Polycystic Ovary Syndrome, Body dissatisfaction, depression, self-esteem, self-compassion.

INTRODUCTION

One of the common health problems that women faces when they are trying to have babies is Polycystic Ovary Syndrome or PCOS. About 8 to 13 percent of women are impacted because of PCOs.¹ PCOS can really mess with hormones whether they can have a baby and how they feel overall. It is surprising that up to 80 percent of them a women who have PCOS do not even know they have it. So, PCOS occurs when the ovaries produce more androgen (hormones related to male traits) than estrogen (which is associated to female traits). Everyone naturally has both androgens and estrogens in their body, but with PCOS, the balance tips toward more androgens. When your body makes too many androgens it can cause problems, with your ovaries releasing eggs and can also cause some other symptoms of PCOS.²

Unhealthy dietary habits decreased appetitive responses, poor cognitive function, hair issues, and mental instability. Recent studies state that eating disorder attitudes and behaviors are more common in women suffering from PCOS compared to

the normal population.³ Studies show that there are vast disparities in terms of health orientation, including health anxiety and self-assurance between PCOS patients and non-PCOS females.^{2,4} Psychological and physical factors play a role in how Polycystic Ovary Syndrome (PCOS) and Eating Disorders (EDs) are connected. People with ovary syndrome (PCOS) often feel stressed, sad, anxious and unhappy with their body. Polycystic ovary syndrome (PCOS) is a hormonal disorder in young girls and teens.⁵

It causes personality changes like weight gain, acne, extra hair and dark skin patches which can make them feel bad, about their body and not very feminine.⁶ Though the typical age group where PCOS occurs among girls is during puberty, PCOS can occur even before or after puberty with the help of psychological and physiological aspects. As a result, psychological stress associated with the symptoms of PCOS, including body dissatisfaction and anxiety, contributes to a high risk of disordered eating behaviors, which could be aggravated by PCOS symptoms.⁷

Although the relationship between PCOS and disordered eating has been well-documented is but they still a lack of understanding of the etiological mechanisms involved. The role of PCOS treatment on mental health outcomes, including eating attitudes, needs to be investigated in detail to create effective interventions. Also, differences in health orientation such as health anxiety and health esteem also affect eating attitudes with significant difference between women with and with PCOS.⁵

This study aims to find the connection between body dissatisfaction and depression in women with PCOS, by investing the relationships between these variables like health anxiety and health esteem; and further influencing eating attitudes. And find out the interactions between the brain health and PCOS by examining the contribution of these changes in non-homeostatic eating, diminished appetitive responses, cognitive impairment, and mood disorders. These mechanisms are crucial to understanding developing specific interventions that will not only improve metabolic stress and anxiety of PCOS but also its serious psychological aspects.

Hypotheses:

1. **Hypothesis 1:** There is a positive correlation between body dissatisfaction and depression among adolescents with PCOS.
2. **Hypothesis 2:** Self-esteem and self-compassion are negatively correlated with depression among adolescents with PCOS.
3. **Hypothesis 3:** Self-esteem and self-compassion partially mediate the relationship between body dissatisfaction and depression among adolescents with PCOS

MATERIAL AND METHODS:

Study design:

The research question is suitable to be investigated using a cross-sectional study because it is necessary to investigate the connections between variables at a specific moment in time. A local community of adolescent (12-35 years) with PCOS who had been diagnosed between January and December in a health facility formed a convenience sample.

The inclusion criteria of the study were: (1) satisfying the established diagnostic criteria of polycystic ovarian syndrome. (2) Women of ages between 15 and 35 years. (3) No prior ovarian surgery in the past 6 months. (4) No use of medications that affect the endocrine system in the past 3 months. (5) Have been provided with all the information about the study and have given explicit consent to the participant or his/her family.

The exclusion criteria include: (1) The occurrence of diseases that may lead to increased androgen levels, including diabetes mellitus, adrenal hyperplasia, cushion syndrome, or those that produce androgens. Also, other conditions that cause ovulation disorders like hyperprolactinemia, premature ovarian failure, hypothalamic-pituitary amenorrhea, or thyroid dysfunction are also listed as exclusion criteria. (2) Omission of people with psychiatric issues that may consequently affect the research findings. (3) Congenital hypoplasia/malformation of the reproductive organs is a situation where the reproductive organs is a situation where the reproductive organs are immature or are in a form of structural defects at birth. (4) Acute issues with the kidneys, liver, heart or blood.

Body dissatisfaction:

The Negative Physical Self Scale, which was development by Chen⁸, was used to measure body dissatisfaction. The scale incorporates 54 items that cover different dimensions of physical self-perception such as overall appearance, fatness, shortness, facial appearance as well as thinness. To conduct this research, we chose three dimensions related to the symptoms of PCOS: overall appearance (6 items), facial looks (12 items) and fatness (12 items). The respondents will be asked to identify the extent to which they agree with each statement on a 5-item scale of 0 (not at all like me) to 4 (very much like me). The scale is also reliable with a test-retest coefficients of reliability being 0.89 in a test-retest interval of 3 weeks and the Cronbach alpha of 0.86 which depicts high internal consistency.

Depression:

The center of Epidemiologic Studies Depression Scale (CES-D) was used to measure depression, and it was created by Radloff.⁹ This 20-item self-report scale evaluates the occurrence of depressive symptoms in the last week, such as restless sleep, and loneliness, where answers are 0 (rarely), 1 (some), 2(a lot), and 3(most or almost all the time). The scores are 0 to 60 with a high score being associated with more frequent depressive symptoms.

Self-esteem:

The shortened version of Self-Esteem Scale (SES) of Rosenberg, 1965 was used to assess self-esteem. This scale has 10 questions that are used to test self-worth using a scale of 1 (strongly disagree) to 4 (strongly agree), a higher score on the scale indicates a higher self-esteem. The SES is especially characterized by high internal consistency with Guttman scale coefficient of reproducibility of 0.92 and test-retest reliability of 0.85 and 0.88 which are excellent in terms of stability.¹⁰

Self-compassion:

The revised Self Compassion Scale for Adolescents was used to measure self-compassion and was adapted by Gong et al. This tool has 12 items that are divided into three dimensions: self-kindness, common humanity, and mindfulness. All of the items are rated on a 5-point scale between 1 (almost never) and 5 (almost always). A score on this scale is higher, which indicates higher levels of self-compassion. The scale has evidenced by a Cronbach alpha of 0.770.¹¹

Methodology

The analytical, cross-sectional study of women with clinically established Polycystic Ovary Syndrome (PCOS) in gynecology, infertility, and dermatology outpatient clinics. Participants who were eligible were recruited in the process of routine follow-up visits. We uses the Rotterdam criteria for the diagnoses of PCOS. It is defined as the presence of two or more of the following: oligo/anovulation, clinical and/or biochemical hyperandrogenism, and polycystic ovaries on ultrasound.

The population was women between 18 years and 45 years of age with PCOS. No exclusion was made based on the marital status as fertility problems are reported in both married and single women with PCOS. The women were excluded if they had other endocrine or metabolic conditions that could influence the diagnosis of PCOS such as thyroid disease, hyperprolactinemia, or non-classic adrenal hyperplasia. Women with a known psychiatric illness or exposure to psychiatric medication in past three months were also excluded. The participants were enrolled with written informed consent.

Measures

Data collection encompassed four domains, (1) Sociodemographic: Age, marital status, education, occupation, family income, reproductive history. (2) Anthropometric: BMI, measured using standardized procedures. (3) Clinical: Hirsutism, evaluated via Ferriman-Gallwey score (score of 8 or higher=hirsutism) (4) Menstrual: Cycle pattern in the past 12 months, classified as normal, oligomenorrheic, amenorrheic, or variable. (5) Infertility: as present or absent.

Survey Method

This study's sample size was calculated using the formula for cross-sectional studies. The estimated prevalence of depression among women with PCOS was set at 20% in line with previous studies. The sample size needed was 245 participants with a 95% confidence level and a 5% margin error. Anticipating a 20% non-response or incomplete response questionnaire, the target sample size was increased to 300 participants.

Data were collected using a self-administrated questionnaire containing questions about socio-demographic and clinical information (e.g., age, marital status, educational status, height, and weight, along with validated scales assessing body dissatisfaction, depression, self-esteem, and self-compassion).

Statistical Analysis

Data analysis was performed with the IBM SPSS Statistic software package version 23.0 for windows (IBM Corp., Armonk, NY, USA) and Andrew F. Hayes' PROCESS Macro version 3.4.1. Descriptive Statistics were used to report the socio-demographic characteristics and variables of interest. The continuous variables were presented as mean \pm standard deviation (SD) while categorical variables were shown as frequency and percentages. At first, data cleaning was performed to check for completeness of the data and then inferential statistical tests were carried out to test for normality and outliers. Pearson's correlation was done to assess the relationship of body dissatisfaction, self-esteem, self-compassion and depression.

Mediation analysis was done using Parallel Mediation (PROCESS) model to examine the effects of self-esteem and self-compassion on the body dissatisfaction-depression relationship. Body Dissatisfaction was set as independent variable; depression as dependent variable; and self-esteem and self-compassion as parallel mediators.

The total, direct and indirect effects through the mediators were estimated. The indirect effects were tested for significance using the bias-corrected bootstrap method (5,000 bootstraps, 95% confidence intervals [CIs]). The presence of mediation was considered significant if the confidence interval did not include zero. A p-value of less than 0.05 was accepted as statistically significant.

RESULTS:

A sample of 300 questionnaire was given to women with PCOS. A total of 287 questionnaires were returned and deemed eligible for analysis (response rate of 95.7%). The mean age of the participants was 18.00 ± 1.25 years, and the mean BMI was 33.38 ± 3.21 kg/m²

The findings of table 1 reflect the psychological and physical burden associated with PCOS an provide a descriptive overview of the key variables examined in the study.

Table 1. Descriptive Statistics of Demographic and Psychological Variables (N = 287)

Variables	Categories	Mean/SD
Age (Year)		18.00 ± 1.25
BMI (Kg/m ²)		33.38 ± 3.21 kg/m ² .
Acne	Yes=1	85± 21.35
	No=0	202± 38.21
Marital Status	Married=1	147±5.84
	Non-Married=0	140±3.98
Interval between menstruation(days)	<21	
	21–34	92±40
	35–60	45±22
	Variable	150±43.4
Hirsutism	Yes=1	192±14.80
	No=0	95±20.01
Acanthosis nigricans	Yes=1	91±25
	No=0	196±20

Table 2. Descriptive Statistics and Category Distribution

Variable	Mean ± SD	Range	Category	n	%
Body dissatisfaction	3.05 ± 0.21	(1.1–4.6)	Satisfied (0)	89	31.01
			Dissatisfied (1)	198	68.98
Overall appearance	2.81 ± 0.79	(1.0–5.0)	Satisfied (0)	42	14.63
			Dissatisfied (1)	245	85.36
Fatness	2.50 ± 0.92	(1.0–5.0)	Satisfied (0)	141	49.12
			Dissatisfied (1)	146	50.87
Facial looks	1.97 ± 0.23	(1.0–5.0)	Satisfied (0)	95	33.10
			Dissatisfied (1)	192	66.89
Depression	20.08 ± 12.59	(0.0–47.0)	None (0–15)	146	50.87
			Possible (16–60)	141	49.12
Self-esteem	31.02 ± 3.53	(10.0–38.0)			
Self-compassion	42.16 ± 7.14	(21.0–57.0)			

Table 3: Correlation matrix of body dissatisfaction, Self-esteem, Self-compassion & Depression (N=287).

	Body dissatisfaction	Self-esteem	Self-compassion
Self-esteem Self	-0.498***	—	—
Self-compassion	-0.504***	0.702***	—
Depression	0.483***	0.701***	-0.599***

***p < 0.001. We controlled for age, BMI, acne, hirsutism, and acanthosis nigricans.

Table: 4 Result of mediating effect analysis (N=287)

Variables	Model 1 Depression β (t)	Model 2 Self-Esteem β (t)	Model 3 Self-Compassion β (t)	Model 4 Depression β (t)
Age	0.241 (0.612)	0.042 (0.198)	-0.298 (-1.105)	0.173 (0.541))
BMI	-0.372*(-2.214)	-0.372*(-2.214)	-0.372*(-2.214)	-0.107 (-0.784)
Acne	-0.354 (-0.284)	-0.354 (-0.284)	-0.354 (-0.284)	-0.354 (-0.284)
Hirsutism	-1.927 (-1.332)	-1.927 (-1.332)	-1.927 (-1.332)	-1.927 (-1.332)
Acanthosis nigricans	-0.641 (-0.452)	-0.641 (-0.452)	-0.641 (-0.452)	-0.641 (-0.452)
Body dissatisfaction	8.936*** (11.742)	8.936*** (11.742)	8.936*** (11.742)	8.936*** (11.742)

Self-esteem	—	—	—	-0.912*** (-7.216)
Self-compassion	—	—	—	-0.301*** (-3.542)
R ²	0.392	0.392	0.392	0.392
Adjusted R ²	0.379	0.379	0.379	0.379
F-value	29.864***	29.864***	29.864***	29.864***

Model 1=Total effect (Body dissatisfaction → Depression), **Model 2**=Predictor → Self-esteem, **Model 3**=Predictor → Self-compassion, **Model 4**=Full model (with mediators)

*p < 0.05, **p < 0.01, ***p < 0.001

DISCUSSION:

This study found the connection between not being happy with your body and feeling depressed in women who have Polycystic Ovary Syndrome also known as PCOS. The study focused on how self-esteem and self-compassion affect this relationship. The results showed that women with PCOS have a psychological burden and that there are certain reasons why body image issues can lead to depressive symptoms.

The women in the study were mostly young (with an age of 18 ± 1.25 years) and they had a high body mass index or BMI (33.38 ± 3.21 kg/m²) which is a measure of body fat. They also had a lot of symptoms like acne, hair on their bodies and dark skin patches which can make them feel bad about their bodies. As you can see in Table 1 the participants were predominantly young with a mean BMI, which is a sign of both metabolic and visible clinical manifestations of PCOS¹². The study found that a lot of the women 68.98 percent were not happy with their bodies and about 49.12 percent had symptoms of depression. The average score for depression was high (20.08 ± 12.59) which means that the symptoms were serious. However, the women's self-esteem and self-compassion scores were over the place, which means that some of them were more able to deal with their emotions than others.^{13,14} The descriptive results in Table 2 demonstrate a prevalence of body dissatisfaction and a considerable proportion of participants with depressive symptoms.

When the researchers looked at the connections between these things they found that not being happy with your body was linked to feeling depressed and that it was also linked to having self-esteem and self-compassion.¹⁵ Self-compassion was strongly linked to not feeling depressed. The correlation analysis in Table 3 revealed that body dissatisfaction was positively associated with depression and negatively associated with both self-esteem and self-compassion.

The study also found that not being happy with your body could predict whether someone would feel depressed and that self-esteem and self-compassion could help reduce the risk of depression. These findings are consistent with what other studies have found.^{16,17} The regression analysis in Table 4 further showed that body dissatisfaction significantly predicted depression with the effect attenuated but remaining significant after inclusion of mediators.

The researchers think that the physical symptoms of PCOS like weight gain and acne can make women feel bad about their bodies, which can lead to depression. They also think that societal expectations about how women should look can make things worse. The high prevalence of body dissatisfaction in this cohort is comparable to reports, which highlight body image disturbance as a central psychological concern in PCOS populations.

Mechanisms and Implications

The study found that self-compassion is very important in reducing the risk of depression and that it can help women deal with the impact of PCOS. The strong association between self-compassion and self-esteem observed in this study supports the notion that these constructs interrelated components of psychological resilience. Self-compassion can help women be kind to themselves. Feel more balanced which can reduce the negative effects of body image issues.^{4,18}

The researchers also found that self-esteem and self-compassion can help explain why body dissatisfaction is linked to depression.^{5,19} They think that other factors, like how women cope with stress and how they compare themselves to others may also play a role. The mediation findings are consistent with models suggesting that body dissatisfaction influences depression indirectly through cognitive and emotional processes.^{4,11}

The study findings have implications for how we treat women with PCOS. The researchers think that psychological assessments should be a part of PCOS care and that therapies like cognitive-behavioral therapy and mindfulness-based interventions may be helpful in reducing depressive symptoms. Mechanisms and Implications of the study findings are discussed in detail highlighting the importance of integrating assessment into routine PCOS management.²⁰

Overall, the study shows that body dissatisfaction is a problem for women with PCOS and that self-compassion and self-esteem can help reduce the risk of depression. The study findings are consistent with existing literature.^{2,13} Highlight the

need for a biopsychosocial approach to understanding the relationship between body dissatisfaction and depressive symptoms in women, with PCOS.

Strengths and Limitations

This study has several strengths. First, it has a relatively large sample, which helps to ensure our results are valid. It also employs reliable ways to assess key psychological factors. Through mediation analysis, we can better understand the relationships between variables. In addition, this study considered many health variables, such as body mass index, acne, and excessive hair growth, which ensures the results are more reliable. This means that the results aren't affected by other factors and we get a clearer picture of how the variables are related. Overall, the research design and methods are a good basis for investigating the questions at hand.

But there are some limitations:

- This study design doesn't enable us to see if one thing leads to another, and it restricts what we can say about relationships over time.
- Convenience sampling may influence validity and the ability to generalize.
- Self-reports of things like diet can be affected by reporting bias. Because those in the study's finding aren't relevant to older women with PCOS.
- We can't be completely sure that some things are really affecting the results, such as social status or other social support, because we couldn't account for these entirely.

And these factors mean we need to think about the result as associated, rather than casual.

CONCLUSION:

Overall, body dissatisfaction is strongly linked to depressive symptoms in women with PCOS, and this association is partially explained by self-esteem and self-compassion. This research suggests the need to consider psychological factors, in addition to the disease's symptoms, in the management of PCOS. Strategies to increase self-compassion and self-esteem may be beneficial in enhancing psychological outcomes.

Future Research and Recommendations

Future studies need to build on these findings by:

- Longitudinal design to determine casual relationships and ordering.
- Sampling larger and more representative samples.
- Investigation of other moderators and mediators such as coping stigma and social support.
- Incorporation of physiological measures (e.g., hormone levels) to understand mechanisms.

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