



ISSN (P): 2522-6614
ISSN (E): 2522-6622
© Gynaecology Journal
www.gynaecologyjournal.com
2025; 9(1): 32-38
Received: 05-11-2024
Accepted: 09-12-2024

Gayathri Pavithran
Sri Siddhartha Medical College,
Tumakuru, Karnataka, India

Correlation of clinical and sonological parameters with psychological distress in young women with polycystic ovarian syndrome

Gayathri Pavithran

DOI: <https://doi.org/10.33545/gynae.2025.v9.i1a.1564>

Abstract

Introduction: Women with polycystic ovary syndrome (PCOS) exhibit compromised psychiatric health. Independent of obesity, women with PCOS are more susceptible to have anxiety and depression diagnoses and other psychiatrist disorders. More recently a higher risk of mood and anxiety disorders has been reported in women with PCOS. Women with PCOS have higher depression scores and a higher risk of depression independent of BMI. Although clinical features of hyperandrogenism affect health related quality of life, the association between hirsutism, acne, body image and depression is currently unclear. Similarly there is limited data on the association between variables such as biochemical hyperandrogenism or infertility and depression. Clinicians should be aware of the increased risk of emotional distress and depression in women with PCOS.

Methodology: The study was done in the Department of Obstetrics and Gynecology at Sri Siddhartha Medical College, among the women in out-patient as per the inclusion and exclusion criteria after getting their consent. Over an 18 month period between August 2022 to February 2024. The diagnosis of PCOS was made according to the joint criteria of the Rotterdam, European Society of Human Reproduction and Embryology and the American Society of Reproductive Medicine (ESHRE/ASRM).

Interpretation: As the physical manifestations of PCOS start to become evident at younger ages, the current childhood obesity is epidemic worldwide, and that the sensitivity of girls to their body image is more prevalent during the teen years, evaluating mood disorders among adolescents with PCOS becomes more relevant here.

Conclusion: The present study concluded that PCOS is intimately linked with depression and emotional distress, and this has important implications for the diagnosis and treatment of disorders.

Keywords: Polycystic Ovarian Syndrome, psychological distress, sonological parameters, depression, waist hip ratio, acne, hirsutism, anxiety, clinical correlation

Introduction

Polycystic ovary syndrome (PCOS) is one of the most common endocrine metabolic disorders, affecting 8-22.5% of women of reproductive age group in India. PCOS often presents during adolescence age group and is characterized by primarily ovulatory dysfunction and hyperandrogenism^[1-2].

The symptoms includes hirsutism (excess facial and body hair), obesity, acne, and irregular menstrual cycles, causes considerable anxiety and distress with regard to body image and feminine identity, which impair the psychological well-being of women with PCOS^[3-5].

Women with PCOS experience more depressive and anxiety problems, and have lower self-esteem, and experience a more negative body image compared to women without PCOS^[6].

The present study evaluate the psychological distress and depression levels of young adults with PCOS in comparison to age and body mass index (BMI) and to determine the possible factors affecting these psychological parameters affected by PCOS.

Aim of the study

To assess the correlation of clinical, biochemical and sonological parameters with psychological distress in young women with PCOS.

Corresponding Author:
Gayathri Pavithran
Sri Siddhartha Medical College,
Tumakuru, Karnataka, India

Objectives of the study

1. To correlate the diagnostic parameters of PCOS with emotional distress and depressive symptoms among outpatients suffering from PCOS.
2. To determine if any specific symptoms of PCOS are associated with emotional distress among young females.

Inclusion criteria

Patients diagnosed with PCOS as per Rotterdam and ESHER/ASRM criteria.

- Oligo-ovulation and / or anovulation.
- Hyperandrogenism.
- Polycystic ovaries in ultra sound.

Young female patients in the age group (15-25 years).

Patients willing to give informed consent.

Exclusion criteria

1. Patients who have consulted a psychiatrist or are already diagnosed as having a mental illness by self-report on history and perusal of past medical records
2. Patients having a concurrent, significant medical illness.

Methodology

This is a cross-sectional study which was conducted in the Department of Obstetrics and Gynecology at Sri Siddhartha Medical College, Tumkur during the period from August 2022 to February 2024 after getting the approval from the Ethical Committee among the women in out-patient department of OBG as per the inclusion and exclusion criteria after proper counselling and after getting their consent.

Method of data collection

This cross sectional study analyzing 185 consecutive patients with PCOS living in the Tumkur district. They are analyzed from the outpatient clinics of the Department of Gynaecology and Obstetrics, department of Sri Siddhartha Medical College, and hospital, Tumkur Katakana, over a 18 month period between August 2022 to February 2024. The diagnosis of PCOS was made according to the joint criteria of the Rotterdam, European Society of Human Reproduction and Embryology and the American Society of Reproductive Medicine (ESHRE/ASRM).

- Materials.
- Becks depression inventory questionnaire.
- Short general health questionnaire (GHQ 12).

Statistical Analysis: Data were entered in MS-Excel and analyzed in SPSS V26. Descriptive statistics were represented with percentages for qualitative data, Mean with SD for quantitative data. Chi-square test, Fisher Exact test were applied for comparison of proportions. Spearman correlation was applied. $P \leq 0.05$ was considered as statistically significant.

Results: In this study, we investigated the association between various demographic and clinical factors and the severity of depressive symptoms among the participants. The factors analyzed included Body Mass Index (BMI), acne scores, hirsutism scores, socioeconomic status (SES), age, and their respective categories of depression severity as defined by the Beck Depression Inventory (BDI) and General Health Questionnaire (GHQ-12).

The general characteristics of the participants are as follows

The study sample comprised participants with an average age of 20.01 years (± 2.28 years). The mean Body Mass Index (BMI)

was 23.95 (± 4.64), and the Waist-Hip Ratio (WHR) averaged 0.90 (± 0.14). The average acne score was 3.63 (± 2.84), while the mean hirsutism score was 2.52 (± 2.20). Participants reported an average duration of complaints of 6.66 months (± 6.94 months) and an average age of menarche of 12.85 years (± 0.96 years). The Beck Depression Inventory (BDI) scores averaged 10.38 (± 2.99), and the General Health Questionnaire (GHQ-12) scores averaged 1.79 (± 1.34). These characteristics provide a comprehensive overview of the demographic and clinical profile of the study participants.

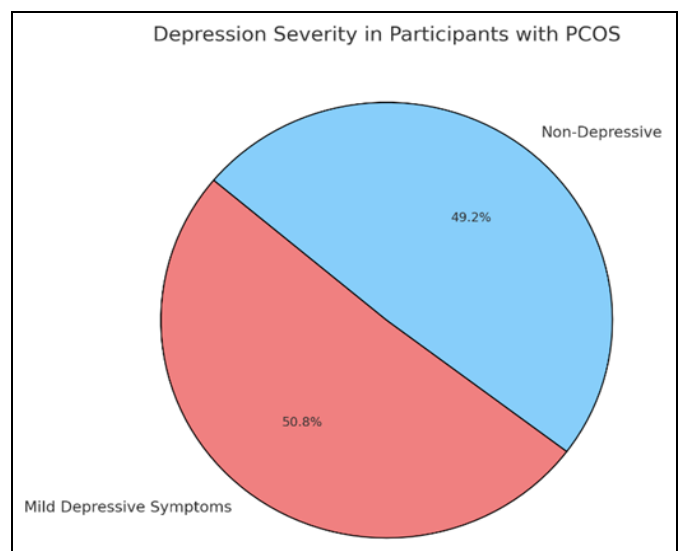
Table 1: General characteristics of the study participants

Characteristic	Value
Age (Mean \pm SD)	20.01 \pm 2.28
BMI (Mean \pm SD)	23.95 \pm 4.64
WHR (Mean \pm SD)	0.90 \pm 0.14
Acne Score (Mean \pm SD)	3.63 \pm 2.84
Hirsutism Score (Mean \pm SD)	2.52 \pm 2.20
Duration of Complaints (Mean \pm SD)	6.66 \pm 6.94
Age of Menarche (Mean \pm SD)	12.85 \pm 0.96
BDI Score (Mean \pm SD)	10.38 \pm 2.99
GHQ12 Score (Mean \pm SD)	1.79 \pm 1.34

Depression in Participants with PCOS

Among the participants diagnosed with Polycystic Ovary Syndrome (PCOS), the overall prevalence of depressive symptoms was notably high. Using the Beck Depression Inventory (BDI) scores, we categorized individuals into non-depressive, mild depressive symptoms, and moderate to severe depressive symptoms. Our analysis revealed that:

- 50.81% (94) of the participants exhibited mild depressive symptoms.
- 49.19% (91) were non-depressive.



Graph 1: Depression among participants

None of the participants fell into the category of moderate to severe depressive symptoms.

The General Health Questionnaire (GHQ-12) was used to assess the risk of psychiatric distress among the participants. A cut-off score of 3 or higher was used to indicate a risk of psychiatric distress.

27.57% of the participants (51 out of 185) were at risk of psychiatric distress (GHQ12 score ≥ 3).

This highlights the substantial psychological burden associated with PCOS, as over half of the individuals experienced some

level of depressive symptoms. These findings underscore the importance of integrating mental health support into the management and treatment plans for individuals with PCOS to

address the elevated risk of depression and enhance overall quality of life.

Table 2: Comparison of characteristics of participants with mild depression and no depression

Characteristic	Mild Depressive Symptoms (Mean ± SD)	Non-Depressive (Mean ± SD)	T-Statistic	P-Value
Age	19.78±2.22	20.25±2.33	-1.424	0.156
BMI	24.12±5.52	23.78±3.55	0.498	0.619
WHR	0.90±0.15	0.90±0.14	-0.131	0.896
Acne Score	3.79±2.94	3.47±2.74	0.752	0.453
Hirsutism Score	2.64±2.07	2.40±2.34	0.748	0.456
Duration of Complaints	2.64±2.07	6.24±6.63	0.815	0.416
Age of Menarche	12.81±1.02	12.90±0.90	-0.656	0.513

Characteristics such as Age, BMI, WHR, Acne Score, Hirsutism Score, Duration of Complaints, and Age of Menarche do not show statistically significant differences between the two groups, as their p-values are greater than the typical significance level of 0.05.

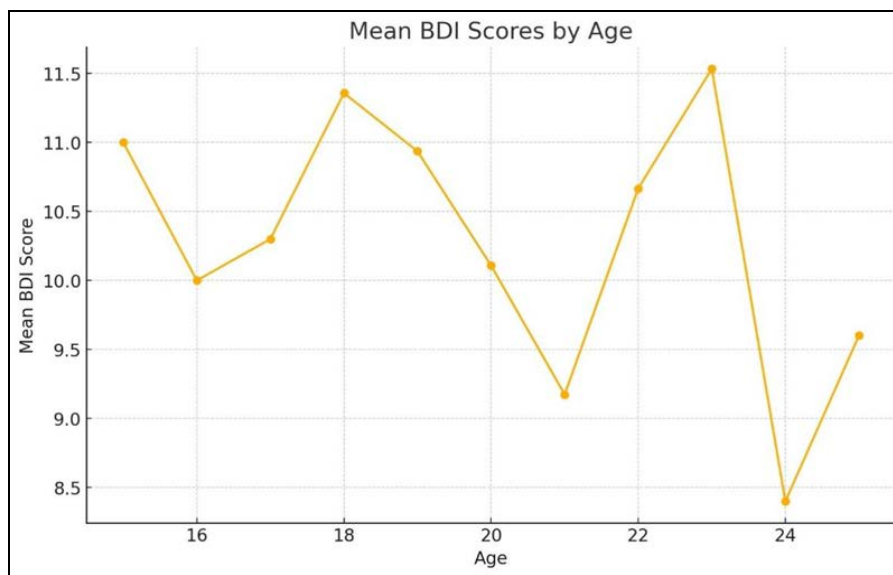
(BMI, acne scores, hirsutism scores, SES, and age) and depression severity to identify any significant patterns.

Age and Depression

Age was grouped into four categories: 15-18, 19-22, 23-25. The chi-square test indicated a significant association between age groups and depression severity (P=0.013).

Association of Various Factors with Depression Severity

Next, we analyzed the association between different factors



Graph 2: Mean BDI Scores by age

There is variability in the mean BDI scores across different ages. Ages 23, and 18 show relatively higher mean BDI scores, indicating more severe depressive symptoms on average. Ages

24, 21, and 16 show lower mean BDI scores, indicating less severe depressive symptoms on average.

Table 3: Association of age categories with depression in PCOS

Age Group	Mild Depressive Symptoms (N, %)	Non-Depressive (N, %)	Chi-Square Statistic	P-Value
15-18	36 (73.5%)	13 (26.5%)	6.045179	0.048675
19-22	58 (54.7%)	48 (45.3%)		
23-25	15 (50.0%)	15 (50.0%)		

The p-value of 0.04 is less than the typical significance level of 0.05. This suggests that there is a statistically significant association between age groups and depression categories (BDI) in the given data set.

statistically significant association between age categories and the risk of psychiatric distress as measured by GHQ12 in this dataset?

This means that within this dataset, the severity of depressive symptoms varies significantly across different age groups. The age group 19-22 has the highest counts of both mild depressive symptoms and non-depressive cases, indicating a more varied distribution of depression severity in this age range. However for the GHQ12, The p value was 0.297, suggesting that there is no

Body Mass Index (BMI) and Depression

We categorized BMI into four groups underweight, healthy weight, overweight, and obesity. The chi-square test indicated no significant association between BMI categories and depression severity (P=0.575). This suggests that BMI does not significantly influence depression severity in this dataset. BMI

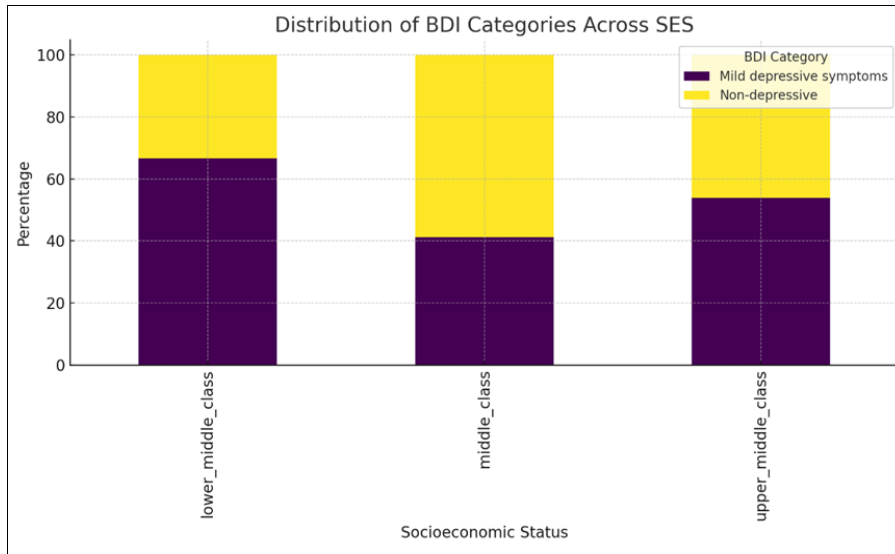
categories do not significantly influence the likelihood of being at risk for psychiatric distress among the participants using the GHQ12 as well (P=0.649).

Association between WHR Categories and Depression Categories: WHR categories do not significantly influence the likelihood of experiencing depressive symptoms or psychiatric distress among the participants (p-values for both BDI and GHQ12 categories >0.05). This suggests that WHR, in this

dataset, is not a major determinant of mental health outcomes in individuals with PCOS.

Socioeconomic Status (SES) and Depression

The chi-square test for SES categories (lower middle class, middle class, upper middle class) and depression categories revealed a significant association (P=0.008). This suggests that socioeconomic status significantly influences the likelihood of experiencing depressive symptoms.



Graph 3: Depression among categories of SES

SES	Mild Depressive Symptoms (N, %)	Non-Depressive (N, %)	Chi-Square Statistic	P-Value
Lower middle class	38 (66.67%)	19 (33.33%)	9.618	0.008158
Middle class	42 (41.18%)	60 (58.82%)		
Upper middle class	14 (53.85%)	12 (46.15%)		
Total	94	91		

Table 4: Association of Socioeconomic Status (SES) with Psychological Distress (GHQ12 Scores)

SES	No risk	Risk of psychiatric distress	Chi-Square Statistic	P-Value
Lower middle class	35	22	6.094	0.048
Middle class	81	21		
Upper middle class	18	8		
Total	134	51		

The p-value of 0.048 is slightly less than the typical significance level of 0.05, suggesting that there is a statistically significant association between socioeconomic status (SES) and the risk of psychiatric distress as measured by GHQ12 in this dataset. This analysis indicates that socioeconomic status significantly influences the likelihood of being at risk for psychiatric distress among the participants. Individuals in the lower middle class show a higher proportion of psychiatric distress compared to

those in the middle and upper middle classes. This finding underscores the importance of considering socioeconomic factors when assessing and addressing mental health needs in individuals with PCOS.

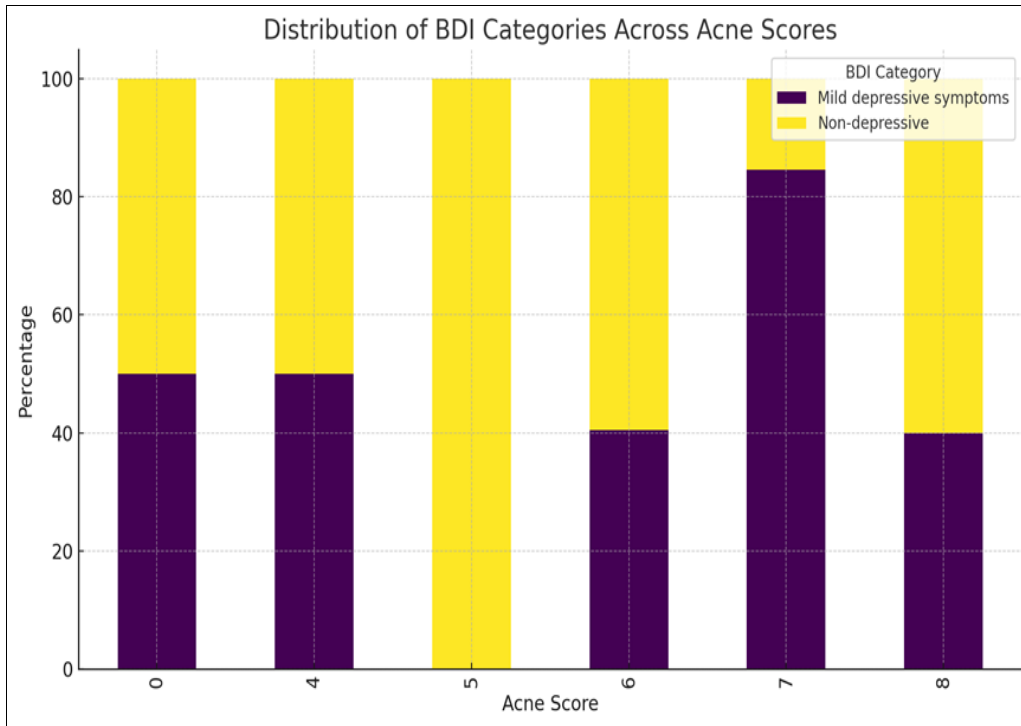
Acne Scores and Depression

Acne scores were taken as such to understand the association between depression and the same.

Table 5: Association between acne scores and depression (BDI)

Acne Score	Mild depressive symptoms	Non-depressive	Chi-Square and P-Value
0	32	32	Chi-Square Statistic: 20.142 Degrees of Freedom: 5 P-Value: 0.0012
4	21	21	
5	0	6	
6	17	25	
7	22	4	
8	2	3	
Total	94	91	

The p-value of 0.0012 is less than the typical significance level of 0.05. This suggests that there is a statistically significant association between acne scores and depression categories (BDI) in the given data set.



Graph 4: Depression among participants according to ACNE score

This means that within this dataset, acne severity is significantly associated with the likelihood of experiencing depressive symptoms as defined by the BDI scores.

However, for the GHQ12 Categories the p-value of 0.693 was obtained, suggesting no statistically significant association between acne scores and the risk of psychiatric distress as

measured by GHQ12 in this dataset.

Hirsutism Scores and Depression

Hirsutism scores were assessed using the modified Ferriman-Gallwey score and categorized into mild, moderate and severe.

Table 6: Association between Hirsutism and Depression (BDI)

Hirsutism Category	Mild depressive symptoms	Non-Depressive	Chi-Square and P-Value
Mild Hirsutism	37	28	0.218, 0.896
Moderate Hirsutism	27	17	
Severe Hirsutism	45	31	

The p-value is greater than the typical significance level of 0.05. This suggests that there is no statistically significant association between the hirsutism categories (non-relevant vs relevant) and depression categories (BDI) in the given data set.

The p-value of 0.03 is below the typical significance level of 0.05, suggesting that there is a significant association between

hirsutism categories and the risk of psychiatric distress as measured by GHQ12 in this dataset. This analysis indicates that there is a trend suggesting that relevant hirsutism might be associated with a higher risk of psychiatric distress, the association is statistically significant at the 0.05 level. This suggests that hirsutism severity, in this dataset, may have some influence on mental health outcomes in individuals with PCOS.

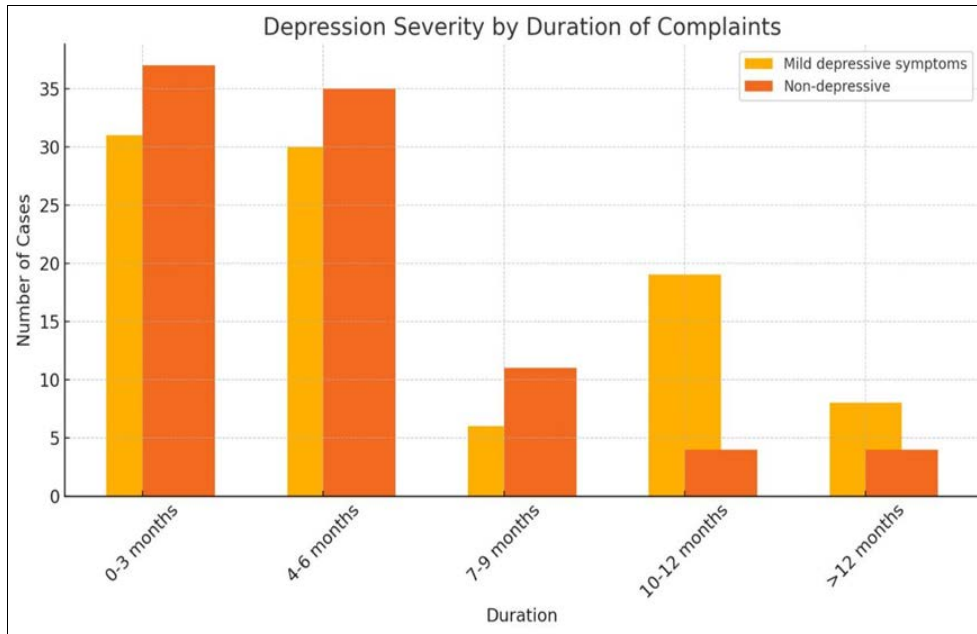
Table 7: Association between Hirsutism with Psychological distress

Hirsutism Category	No risk	Risk of psychiatric distress	Chi-Square and P-Value
Mild Hirsutism	11	54	6.964 0.030
Moderate Hirsutism	12	32	
Severe Hirsutism	28	48	

Table 8: Association between duration of complaints and depression categories

Duration Category	Mild depressive symptoms	Non-depressive	Chi-Square and P-Value
0-3 months	31	37	13.455, P-Value= 0.009
4-6 months	30	35	
7-9 months	6	11	
10-12 months	19	4	
>12 months	8	4	

The p-value of 0.009 is less than the typical significance level of 0.05, indicating a statistically significant association between the duration of complaints and depression severity as measured by BDI in this dataset.



Graph 5: Depression severity by duration of complaints

Table 9: Association between duration of complaints and GHQ12 Categories

Duration Category	No risk	Risk of psychiatric distress	Chi-Square and p-Value
0-3 months	54	14	Chi-Square Statistic: 12.201, P-Value: 0.016
4-6 months	12	5	
7-9 months	50	15	
10-12 months	10	13	
>12 months	8	4	

The p-value of 0.016 is less than the typical significance level of 0.05, indicating a statistically significant association between the duration of complaints and the risk of psychiatric distress as measured by GHQ12 in this dataset.

This analysis indicates that the duration of complaints is significantly associated with both the severity of depressive symptoms and the risk of psychiatric distress among the participants. Specifically, participants with complaints lasting 7-9 months show a higher proportion of mild depressive symptoms and a higher risk of psychiatric distress. This suggests that the length of time individuals experience symptoms may be an important factor in their mental health outcomes, underscoring the need for timely and effective interventions.

Discussion

The relationships between the psychological health aspects and the clinical characteristics of PCOS are not yet clear. The present study was, to clarify the relationship between increased emotional stress, depressive symptoms, and the clinical, and biochemical characteristics of PCOS in a group of young patients with PCOS.

This cross sectional study done among 185 females with PCOS in which 50.81% (94) of the participants exhibited mild depressive symptoms (BDI score \geq 11) and 49.19% (91) individual were non-depressive. The General Health Questionnaire (GHQ-12) was used to assess the risk of psychiatric distress among the participants. A cut-off score of 3 or higher was used to indicate a risk of psychiatric distress. 27.57% of the participants (51 out of 185) were at risk of psychiatric distress (GHQ12 score \geq 3).

In the present study, BMI and WHR were significantly greater in patients with PCOS, for whom results also showed highly elevated emotional distress and depressive disorders. Women with hirsutism and acne have experience heightened levels of

anxiety, depressive symptoms, and significant emotional distress.

It is suggested that women with PCOS have a lower self-esteem, a more negative self-image, and higher levels of depression and psychological distress owing to the physical appearance of hyperandrogenism, including obesity, hirsutism, cystic acne, and hair loss, possibly by influencing feminine identity.

Conclusion

The present study concluded that PCOS is intimately linked with depression and emotional distress, and this has important implications for the diagnosis and treatment of disorders.

The treatment of PCOS should be both physical and psychological complaints.

In order to achieve psycho-social health, patients with PCOS require a combined holistic approach (involving gynaecologist, endocrinologists, dermatologists and psychiatrists).

Psychological symptoms should be evaluated along with clinical symptoms and this should be a routine part of their examinations.

This suggests that further research is warranted investigating if women with PCOS are aware of treatment options and strategies to encourage them to seek help for psychological distress.

Limitations: Even though this study could bring out the association between PCOS symptoms and depression the strength of association was restricted due the limited sample size and the purposive sample selection method used.

Conflict of Interest

Not available

Financial Support

Not available

References

1. Badawy A, Elnashar A. Treatment options for polycystic ovary syndrome. *Int J Womens Health*. 2011;3:25-35. [PMC free article], [PubMed], [Google Scholar]
2. Teede H, Deeks A, Moran L. Polycystic ovary syndrome: a complex condition with psychological, reproductive and metabolic manifestations that impacts on health across the lifespan. *BMC Med*. 2010;8:41. [PMC free article], [PubMed], [Google Scholar]
3. Kitzinger C, Willmott J. The thief of womanhood: women's experience of polycystic ovarian syndrome. *Soc Sci Med*. 2002;54(3):349-361. [PubMed], [Google Scholar]
4. Trent ME, Rich M, Austin SB, Gordon CM. Quality of life in adolescent girls with polycystic ovary syndrome. *Arch Pediatr Adolesc Med*. 2002;156(6):556-560. [PubMed], [Google Scholar]
5. Trent ME, Rich M, Austin SB, Gordon CM. Fertility concerns and sexual behavior in adolescent girls with polycystic ovary syndrome: implications for quality of life. *J Pediatr Adolesc Gynecol*. 2003;16(1):33-37. [PubMed], [Google Scholar]
6. Trent M, Austin SB, Rich M, Gordon CM. Over-weight status of adolescent girls with polycystic ovary syndrome: body mass index as mediator of quality of life. *Ambul Pediatr*. 2005;5(2):107-111. [PubMed], [Google Scholar]
7. Gambineri A, Pelusi C, Vicennati V, Pagotto U, Pasquali R. Obesity and the polycystic ovary syndrome. *Int J Obes Relat Metab Disord*. 2002;26(7):883-896. [PubMed], [Google Scholar]
8. 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(6):853-860. [PubMed], [Google Scholar]
9. Dixon JB, Dixon ME, O'Brien PE. Depression in association with severe obesity: changes with weight loss. *Arch Intern Med*. 2003;163(17):2058-2065. [PubMed], [Google Scholar]
10. Adali E, Yildizhan R, Kurdoglu M, Kulusari A, Edirne T, Sahin HG, *et al*. The relationship between clinico-biochemical characteristics and psychiatric distress in young women with polycystic ovary syndrome. *J Int Med Res*. 2008;36(6):1188-1196. [PubMed], [Google Scholar]
11. Elsenbruch S, Benson S, Hahn S, Tan S, Mann K, Pleger K, *et al*. Determinants of emotional distress in women with polycystic ovary syndrome. *Hum Reprod*. 2006;21(4):1092-9. [PubMed], [Google Scholar]
12. Rasgon NL, Rao RC, Hwang S, Altshuler LL, Elman S, Miller ZJ, *et al*. Depression in women with polycystic ovary syndrome: Clinical and biochemical correlates. *J Affect Disord*. 2003;74(3):299-304. [PubMed], [Google Scholar]
13. Hollinrake E, Abreu A, Maifeld M, Van Voorhis BJ, Dokras A. Increased risk of depressive disorders in women with polycystic ovary syndrome. *Fertil Steril*. 2007;87(6):1369-1376. [PubMed], [Google Scholar]
14. Brown AJ. Depression and insulin resistance: applications to polycystic ovary syndrome. *Clin Obstet Gynecol*. 2004;47(3):592-596. [PubMed], [Google Scholar]
15. Roos C, Lidfeldt J, Agardh CD, Nyberg P, Nerbrand C, Samsioe G, *et al*. Insulin resistance and self-rated symptoms of depression in Swedish women with risk factors for diabetes: The Women's Health in the Lund Area study. *Metabolism*. 2007;56(6):825-829. [PubMed], [Google Scholar]

How to Cite This Article

Pavithran G. Correlation of clinical and sonological parameters with psychological distress in young women with polycystic ovarian syndrome. *International Journal of Clinical Obstetrics and Gynaecology* 2025; 9(1): 32-38.

Creative Commons (CC) License

This is an open-access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.