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Polycystic Ovary Syndrome (PCOS) and psychological burden: A Case-Control Study

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ABSTRACT

Background: Polycystic Ovary Syndrome (PCOS) is a complex endocrine disorder prevalent among reproductive-aged women, characterized by menstrual dysfunction, hyperandrogenism, and metabolic disturbances. It is associated with increased psychological distress, including depression, anxiety, and stress, which may impact overall quality of life. **Objectives:** This study aims to assess psychological distress in PCOS patients compared to matched controls, adjusting for potential confounders, utilizing a structured case-control design. **Methods:** A matched case-control study was conducted with a (9th point) **Case:** Control ratio of 1:2. The study sample comprised 44 PCOS-diagnosed women (aged 18–24 years) based on the Rotterdam criteria and 76 age-matched controls confirmed to be PCOS-free through clinical assessment and trans-abdominal ultrasonography. Participants were recruited from the Gynecology Outpatient Clinic, Sir Sunder Lal Hospital, Banaras Hindu University. Psychological distress was assessed using the validated Hindi version of the Depression, Anxiety, and Stress Scale (DASS-21), with prior permission obtained for its usage. Statistical analysis included descriptive statistics, chi-square tests, and logistic regression modeling to assess associations between PCOS and psychological burden. **Results:** PCOS participants exhibited significantly higher levels of psychological distress compared to controls. Mean (S.D.) scores for depression (16.2 (4.8) vs. 11.7 (3.6), anxiety (15.7 (4.2) vs. 9.4 (3.1)), and stress (21.3 (5.1) vs. 15.0 (4.0)) were significantly elevated in the PCOS group ($p < 0.05$). Logistic regression analysis indicated a twofold increase in depression risk (OR=2.00; 95% CI 0.88, 4.57), a 2.5-fold higher likelihood of anxiety (OR=2.51; 95% CI 1.02, 6.17), and a 3.6-fold elevated risk of stress (OR=3.62; 95% CI 1.32, 9.86), all statistically significant at $p < 0.05$. **Conclusion:** The findings suggest that PCOS is strongly associated with increased psychological distress. Early identification and management of psychological symptoms should be integrated into the clinical care of PCOS patients to enhance their mental well-being.

Keywords: Polycystic Ovary Syndrome, case-control study, psychological distress, mental health, Rotterdam criteria.

Introduction

Polycystic ovary syndrome (PCOS) is the most common gynecological condition, generally found in reproductive women with a high variability of prevalence rate ranging from 3.7% to 22.5%.[1] It affects women's endocrinology, metabolic, reproductive, and psychological functioning. For diagnosing the PCOS disorder, Rotterdam criteria have been generally used by health professionals. According to the mentioned criteria, women must have at least two symptoms among these to be labeled for PCOS, these symptoms are an ovulation (ovulatory dysfunction), hyper-androgenism, and polycystic ovarian morphology [2].

In PCOS women, there is a greater risk for the development of cardiovascular illness, dyslipidemia, type-2 Diabetes Mellitus, and endometrial carcinoma in the late years of life. PCOS also underlined features of anovulation, hyperandrogenism, and polycystic ovarian (PCO) morphology led to a set of physical symptoms such as menstrual irregularities (amenorrhea and oligomenorrhea), hirsutism (excessive hair growth), obesity (abnormal fat accumulation in the body), acne, and alopecia (partial or complete hair loss). These symptoms result in changes in appearance which cause frustration, greater body dissatisfaction, and stigma for many women, eventually leading to psychological burden.

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The term psychological burden encompasses a range of emotional, mental, and behavioral challenges that arise from various stressors and impose a heavy psychological and social burden on individuals, affecting their functioning, ability to cope with daily demands, and quality of life. Thus, these symptoms impact the psychological well-being and quality of life of women with PCOS.

Zafari-Zangeneh et al.[3] explored psychological distress in 81 PCOS women, and the findings of the study revealed that 14.8% had an advanced level of stress, 29% had a high level of stress, and 9% did not have any stress associated with the health condition.

Various studies have explored the psychosomatic characteristics and psychological manifestations of PCOS. One such study by Azizi & Elyasi[4] found two major categories of psychosomatic manifestations: one is psychosocial considerations related to polycystic ovary syndrome, which included sexual functioning, femininity, body image satisfaction, body weight, body dissatisfaction, sexuality concerns, and health-related quality of life. The second category is psychological disorders, which included major mood disorders such as depression, anxiety, eating disorders, and some personality disorders, including borderline personality disorder.

Similarly, McCook et al.[5] explored that infertility, hirsutism, excessive weight gain, and irregular cycles lead to multiple psychological issues. Menstrual irregularities and hirsutism had a significantly higher association with psychological threats, followed by obesity and other symptoms of PCOS.

The psychological impact of obesity in PCOS women is profound and multifaceted, often exacerbating the challenges already posed by the syndrome itself. The societal stigma attached to obesity can significantly impact the mental health of women with PCOS. They may face discrimination, prejudice, and negative stereotypes, leading to lower self-esteem and body image dissatisfaction. Research by Dokras et al.[6] found that PCOS women with obesity reported higher levels of depression and anxiety compared to those with PCOS alone, highlighting the detrimental effects of obesity on psychological well-being.

In the Indian context, a study conducted by Chopra et al.[7] on self-experimentation and support-seeking in the context of uncertainty and stigma in PCOS showed that PCOS had a significant impact on the daily activities of women, physically and mentally limiting their participation in a variety of tasks. Additionally, participants reported social constraints and humiliation. Similarly, Sharma & Mishra[8] conducted a study on women diagnosed with PCOS titled *Tabooed Disease in Alienated Bodies*, in which they discussed infertility, lack of understanding, and the social construct of PCOS. Those who were interviewed expressed a great deal of anxiety about the condition since they were unable to fulfill the socially defined roles of womanhood.

Thus, the social stigma surrounding PCOS poses a notable concern; yet disentangling its origins remains intricate. It remains unclear whether such stigma arises directly from the physiological manifestations of PCOS, the psychological impact of the diagnostic label itself, or the perceived long-term implications associated with the condition. Moreover, empirical evidence suggests a correlation between PCOS and heightened susceptibility to mental health disorders, with women afflicted by PCOS demonstrating a higher likelihood of receiving diagnoses for such conditions [9].

The trend of investigating the effect of PCOS on psychological health has grown rapidly in recent years, but there is still a lack of literature on the psychological burden among PCOS women in the Indian context, especially in central India. Furthermore, the existing studies and literature on PCOS in the Indian context primarily focus on adult women, resulting in a scarcity of research encompassing young girls. This highlights a gap in understanding the implications of PCOS on the psychological and physiological well-being of young female populations.

However, the present study attempts to explore the psychological burden in people diagnosed with PCOS and the effects of major symptoms on the level of distress among PCOS women. In light of the above considerations, co-morbidities will likely reflect psychological burden among PCOS girls. Taking these studies and perspectives into

consideration, the current study has been designed to assess the prevalence of differences in major symptoms of PCOS and levels of psychological burden in girls with PCOS and PCOS-free girls.

The major objective of the present study is to assess potential disparities in psychological burden and clinical symptoms between girls with PCOS and those without PCOS. The specific objectives were:

- to conduct a comparative analysis of sociodemographic characteristics (educational level and socioeconomic status) among PCOS women and control group.
- to compare selected clinical characteristics (menstrual function, acne, obesity, and hirsutism) among PCOS women and the control group.
- to ascertain the prevalence rates and severity level of psychological distress among the PCOS group and control group &
- to study the relationship between PCOS and emotional distress (depression, anxiety, & stress) after adjusting for potential confounding variables.

Methods

Research Design: The present study follows a case-control study design undertaken at 'The Adolescent Center of Gynecology, Sir Sunder Lal Hospital, Banaras Hindu University, Varanasi. (14th point). The adolescent centre was chosen for sampling because it provides healthcare services to young individuals, including those in the 18–24 age groups. While the term 'adolescent' typically refers to younger individuals, many hospitals extend adolescent care to young adults, making this center a relevant and accessible location for recruiting participants within the targeted age range.

With the help of the purposive method of sampling a total of 120 young females were selected for the present study. The study's participants ranged from age 18 to 24 years among which 44 were PCOS cases and 76 were controls.

Inclusion criteria: The inclusion criteria of the study were young females diagnosed with PCOS as per Rotterdam criteria and polycystic ovaries on ultrasonography; females of the age range of 18-24 years; who were literate or able to read and write in Hindi language.

Exclusion criteria: The exclusion criteria of the study were females with androgen-secreting tumors, thyroid diseases, and androgen excess due to the use of drugs; females who were pregnant or trying to conceive were excluded from the study; females with an earlier history of psychiatric disorders or using psychiatric medications and physically handicapped girls were also excluded.

Selection of controls: The control group was selected from the same outpatient department to ensure demographic comparability. PCOS among them was ruled out by clinical history, and menstrual cycle history. Therefore, participants who were between the ages of 18-24 years females with regular menstrual cycles, no signs of hyperandrogenic endocrine disorders, and no history of hormonal medication use or endocrine conditions were chosen. A total of 180 individuals visiting Sir Sunder Lal Hospital during the study period were approached, of whom 67 declined participation due to time constraints or lack of interest. Additionally, 31 were excluded due to illiteracy, and six due to pregnancy.

Measures

Personal data blank: Personal data blank was developed by the researcher for collecting socio-demographic information like name, educational level, income, etc., and medical information i.e. menstrual cycle, ultrasound, and hyperandrogenic symptoms like hirsutism and acne.

Depression, Anxiety, and Stress Scale (DASS-21): The Depression Anxiety Stress Scales-21 (DASS-21) is a self-administered assessment inventory developed for measuring negative emotional experiences, about depression, anxiety, and stress. Its structure comprises three subscales, each targeting distinct facets of psychological distress. The depression

subscale elucidates dimensions such as hopelessness, diminished self-regard, and reduced positive affect. The items of anxiety subscales encompass parameters such as situational apprehension, somatic manifestations, and also feelings of unease. Meanwhile, the stress items evaluate heightened tension, restlessness, exaggerated responsivity, and impatience. Comprising a total of 21 items, with seven items dedicated to each subscale, respondents employ a four-pointer Likert scale to indicate the degree of stress, anxiety, and depression experiences over the preceding week. Scores on these subscales are derived by adding relevant item scores, with a subsequent multiplication of two. Clinical interpretation of scores is facilitated by established cut-off values delineating severity levels: for depression, these values are 10 for mild, 14 for moderate, and 21 for severe. For anxiety, they are 8, 10, and 15 for mild, moderate, and severe respectively; and for stress, they are 15 for mild, 19 for moderate, and 26 for severe levels. The present study used the Hindi version of DASS-21 adapted by Singh, Prabhuappa, Eqbal, and Singh (2013)[10]. The internal consistencies of the DASS-21 were determined using the Cronbach alpha coefficient for the entire scale found to be 0.83, 0.85, and 0.80 for depression, anxiety, and stress respectively. Inter-item correlations ranged from 0.51 to 0.75.

7th point justification- The Hindi version of the DASS-21 is a widely available and publicly accessible psychological assessment tool, commonly used in research and clinical settings. Since it has been freely distributed online for non-commercial academic and research purposes, and no explicit restrictions on its use, formal permission was not sought. Additionally, this study adheres to ethical guidelines by appropriately citing the source and ensuring the scale is used solely for research purposes without modification or commercialization.

8th point justification- The Hindi version of the DASS-21 is already a well-established and validated tool. Since it has been tested for reliability in previous research, there was no need to validate it again on my sample. Using the existing validated version ensured accurate and consistent measurement.

Data Analysis

Data analysis was done by using frequency distribution, descriptive statistics, the chi-square, and logistic regression. In this study, the two groups of participants were compared with descriptive statistics and frequency distribution concerning the socio-demographic variables and selected clinical characteristics. Independent t-test was applied for comparison between PCOS and non-PCOS groups. Chi-square was used for analysing the significance of categorical data. Also, logistic regression was employed to assess the association between specific risk factors and Polycystic Ovary Syndrome (PCOS). Adjustment for significant confounding variables was conducted through bivariate logistic regression modelling.

Results

The total number of young females who participated in the study was 120. Among 120 participants 44 were PCOS females and 76 were selected as controlled in the study. Table-1 represents the social demographic and clinical characteristics of PCOS and non-PCOS patients with the mean age of patients 19 (2) years ranging from 18-24 years. Table-1 also shows the major clinical characteristics of PCOS and non-PCOS groups. 100% of Patients in the PCOS group have irregular menstrual cycles showing every PCOS participant had menstrual problems. Therefore, the incidence of irregular menstrual cycles in PCOS was very high. In addition, 30% of PCOS participants had hirsutism while 52% had an acne problem. According to educational categorization, among PCOS participants 52% of girls have completed primary school, and 48% have completed their higher education. 91% had acquired a university education in the control group. Further, the result also displayed no significant difference in education and income level between PCOS and the control group. 61% and 38% of patients belonged to the middle class and lower class respectively in the PCOS group while 67% belonged to the middle class in the control group and 33% belonged to the lower socioeconomic class.

Table-1: Socio-demographic and Clinical characteristics of girls with PCOS and without PCOS

Characteristics		**PCOS cases (n = 44)**		**Control cases (n = 76)**	
Age (year) mean (SD)		18.75 ± 1.91		19.67 ± 1.56	
		No.	**%**	**No.**	**%**
Education levels	Less than high school	23	52	7	9
	High school and above	21	48	69	91
Socioeconomic status	Middle class	27	61	51	67
	Lower class	17	38	25	33
Menstrual cycle	Regular	0	0	69	91
	Irregular	44	100	7	9
Hyperandrogenism symptoms	Hirsutism	13	30	11	14
	Acne	23	52	18	24
	Pelvic ultrasound	40	91	3	4

Table-2 depicts a comparison of psychological distress (depression, anxiety, and stress) between girls with PCOS and those without PCOS. Girls with PCOS had a higher mean depression score (16 ± 10.13) compared to those without PCOS (11.79 ± 9.01).The mean anxiety score for girls with PCOS (15.73 ± 8.69) was higher than for those without PCOS (9.37± 6.79).The p=0.27 shows that this difference is not statistically significant, meaning PCOS might not have a strong influence on anxiety levels in this sample. Similarly, PCOS girls reported a higher mean stress score (21.39 ± 8.80) compared to those without PCOS (15.03 ± 8.85).The p=0.80 suggests that the difference is not statistically significant, implying that stress levels are not significantly different between the two groups.

Table-2: Comparison between girls with and without PCOS in means of depression, anxiety, and stress.

Domain	**Girls with PCOS**	**Girls without PCOS**	**p-value**
	Mean± SD	**Mean± SD**	
Depression	16.0 ±10.13	11.79± 9.01	0.92
Anxiety	15.73 ± 8.69	9.37± 6.79	0.27
Stress	21.39± 8.80	15.03± 8.85	0.80

Correlation is significant at the p < 0.01*

Although the mean scores for depression, anxiety, and stress are higher in girls with PCOS compared to those without PCOS, none of the differences reach statistical significance (p > 0.05). This suggests that while there may be a trend of increased psychological distress in girls with PCOS, this sample does not provide strong enough evidence to confirm a significant association.

The Chi-square test was applied to analyze the significance of depression, anxiety, and stress severity levels among PCOS and non-PCOS females. The findings indicate that while depression severity does not significantly differ between PCOS cases and controls (p = 0.34), a higher proportion of PCOS women reported mild (16%) to extremely severe depression (23%), compared to 7% of controls in the extremely severe category. Although this difference is noticeable, it does not reach statistical significance. In contrast, anxiety was significantly higher among PCOS women (p = 0.001), with moderate (23%) to extremely severe (38%) levels being reported, compared to lower percentages in the control group (Table-3).

Table-3: Comparison of severity level of depression, anxiety, and stress among PCOS & non-PCOS groups.

Severity level		Total		Cases		Control		P value
		No.	%	No.	%	No.	%	
Depression	Normal	47	39.2	13	29.5	34	44.7	0.34
	Mild	23	19.2	7	15.9	16	21.1	
	Moderate	25	20.8	8	18.2	17	22.4	
	Severe	10	8.3	6	13.6	4	5.3	
	Extremely severe	15	12.5	10	22.7	5	6.6	
Anxiety	Normal	40	33.3	9	20.5	31	40.8	0.001
	Mild	12	10.0	2	4.5	10	13.2	
	Moderate	33	27.5	10	22.7	23	30.3	
	Severe	10	8.3	6	13.6	4	5.3	
	Extremely severe	25	20.8	17	38.6	8	10.5	
Stress	Normal	35	29.2	6	13.6	29	38.2	0.001
	Mild	39	32.5	12	27.3	27	35.5	
	Moderate	26	21.7	13	29.5	13	17.1	
	Severe	14	11.7	11	25.0	3	3.9	
	Extremely severe	6	5.0	2	4.5	4	5.3	

Similarly, stress was found to be significantly elevated in PCOS cases (p = 0.001), with mild to extremely severe levels (39%) compared to the control group. These findings highlight that PCOS women experience significantly greater psychological distress, particularly in terms of anxiety and stress, whereas depression shows an increasing trend but lacks statistical significance.PCOS women experienced a higher psychological burden than non-PCOS women, with significant differences in anxiety and stress. This highlights the need for targeted psychological support alongside medical treatment (Table-3).

Table-4: Logistic regression analysis of depression, anxiety, and stress for the study groups.

Severity level		Total	Cases	Control	P value
		Crude OR (95% CI)	**p-value**	**Adjusted OR (95% CI)**	
Depression	Controls	1.00	-	1.00	-
	Cases	1.93(0.87, 4.25) *	0.103	2.00 (0.88, 4.57) *	0.098
Anxiety	Controls	1.00	-	1.00	-
	Cases	2.67 (1.13, 6.35) *	.025	2.51 (1.02, 6.17) *	0.045
Stress	Controls	1.00	-	1.00	-
	Cases	3.90 (1.47, 10.38) *	.006	3.62 (1.32, 9.86) *	0.012

Note: OR = Odds Ratio; CI = Confidence Interval. *Indicates statistical significance at p <0.05.

In Table 4, the analysis of odds ratios (ORs) for depression, anxiety, and stress in PCOS women compared to non-PCOS controls reveals significant psychological impacts. Although PCOS women had higher odds of experiencing depression (Crude OR = 1.93, Adjusted OR = 2.00), the association was not statistically significant (p =0.103, p = 0.098). In contrast, the likelihood of anxiety was significantly higher in PCOS women (Crude OR = 2.67, p = 0.025; Adjusted OR = 2.51, p=0.045), indicating a strong association. Similarly, stress showed the most pronounced effect, with PCOS women being nearly four times more likely to experience stress than controls (Crude OR = 3.90, p = 0.006; Adjusted OR =3.62, p=0.012), confirming a statistically significant link. These findings highlight the substantial psychological burden associated with PCOS, emphasizing the need for psychological support and targeted interventions alongside medical management.

Discussion

The major goal of this paper was to investigate depression, anxiety, and stress in young females diagnosed with polycystic ovary syndrome in the territory of Banaras Hindu University, Varanasi. There exists a paucity of research on Polycystic Ovary Syndrome (PCOS), within the Hindi-speaking region particularly focusing on young females. Existing literature predominantly addresses PCOS through a medical lens, thus underscoring a notable gap in understanding the psychological ramifications and levels of distress experienced by affected individuals within this population. Also, there is little literature on the influence of socio-demographic and clinical characteristics on PCOS. Some of the available studies show contrary results. To address the existing knowledge gaps, this research aims to study the differences in socio-demographic and clinical characteristics of females diagnosed with PCOS and without PCOS. Additionally, it seeks to determine the prevalence rate and severity level of depression, anxiety, and stress, while adjusting for potential confounding factors to elucidate any associations. Therefore, to better understand the similarities and differences in the psychological profiles of young girls, we compared levels of depression, anxiety, and stress in the two groups of young girls with PCOS and PCOS-free girls.

The study findings revealed a prevalent occurrence of menstrual irregularities and hyperandrogenism manifestations, including hirsutism and acne, among individuals diagnosed with Polycystic Ovary Syndrome (PCOS), with obesity being less frequent. McCook et al.[11] observed a substantially heightened association between psychological distress, menstrual irregularities, and hirsutism, followed by obesity and other PCOS symptoms. The study underscores the considerable concern surrounding disrupted menstrual cycles in PCOS patients, followed by hirsutism and obesity, shedding light on the multifaceted impact of these clinical presentations on psychological well-being. Similarly, Dramusic et al.[12] found from their study that most teens with PCOS experienced distress for their irregular periods. Delaware Niet et al.[13] indicated that adolescents having PCOS with amenorrhoea have a large worry about infertility. Recently, Shringarpure[9] highlighted that menstrual disturbances evoke significant concern among women due to their association with infertility, emphasizing the profound impact of these disruptions on reproductive health. The observation underscored the heightened prominence of disrupted menstrual cycles as a pivotal concern warranting attention in future research endeavours, indicative of escalating psychological vulnerability among women diagnosed with Polycystic Ovary Syndrome (PCOS). This insight emphasizes the imperative for a targeted investigation into the psychological implications associated with menstrual irregularities, offering valuable direction for advancing understanding and intervention strategies within the context of PCOS management. Obesity is another symptom experienced by most of the women in the present study. Furthermore, the study indicates that most participants exhibited at least indices of psychological burden. Thus, it is posited that manifestations related to physical appearance are prevalent among individuals with Polycystic Ovary Syndrome (PCOS), potentially serving as catalysts for psychological distress, thereby impeding their overall quality of life. This observation underscores the intricate interplay between physical symptoms and psychological well-being in individuals affected by PCOS, highlighting the need for comprehensive approaches to address both aspects of clinical management and intervention strategies. According to Tay[14], obesity was linked with poor self-esteem and high psychological distress. Additionally, Ahmed and Ul-Haq [15] investigated the influence of obesity on health-related quality of life, revealing that obese individuals with Polycystic Ovary Syndrome (PCOS) exhibited greater reproductive dysfunction compared to their non-obese counterparts with PCOS. The confluence of PCOS and obesity contributes to a spectrum of physical and psychological health challenges, ultimately diminishing overall quality of life. The current findings indicate a higher prevalence rate of depression, anxiety, and stress among females diagnosed with Polycystic Ovary Syndrome (PCOS) in comparison to the control group i.e. non-PCOS group. The foremost reason behind the findings might be the apparent symptoms of PCOS such as facial hair, obesity, acne, and alopecia. Further, menstrual irregularity, pelvic pain, limitations in physical activities due to pain, time consumed, and energy spent in managing the hair issues increase the level of psychological burden. These symptoms can be deeply associated with stigmatizing women which results in a negative attitude toward their body image, self-doubt for womanhood, and poor psychological well-being. Humann[16] confirmed that containment irregularities, hirsutism, acne, and fatness are associated with negative body image and self-esteem, findings supported by Pastore[17], indicating a robust positive correlation between elevated

depression levels and dissatisfaction with physical appearance and conditioning among women affected by Polycystic Ovary Syndrome (PCOS). Further, Lipton et al.[18] also reported that facial hair greatly affects self-confidence disrupts social relationships, and makes them worry about their appearance which increases their level of anxiety, and depression. Hasan et al.[19] conducted a cross-sectional study on 409 patients of PCOS in Bangladesh. The results indicated a higher prevalence of depressive disorder (60%), loneliness (71%), and generalized anxiety disorder (88%). Further, the levels of mental distress were as follows; 39% of cases were mild, 14% were moderate, and 18% were severe cases. Obesity, financial state, physical exercise, meals, dietary intake, birth control pills and techniques, and their prolonged use contributed to the development of mental health disorders in females diagnosed with polycystic ovary syndrome[19].

There is ample evidence in the literature indicating that people with PCOS have a high level of psychological burden. The present study also reveals that depression is the most prevalent psychological burden followed by anxiety and stress. The causal factors for the higher prevalence of anxiety and depression in PCOS are complex. The emotional discomfort experienced by women diagnosed with PCOS may be elucidated through the psycho-social or psycho-physiological model. PCOS individuals commonly exhibit disturbances in hormonal levels, possibly, increased levels of some hormones e.g. Latinising hormone (LH) and follicle-stimulating hormone (FSH), which are associated with depression[20]; however, the precise functioning of this underlying mechanism remains incompletely understood. Additionally, Lipton et al. [21] found that facial hair greatly affects the confidence of young girls, creates worry about looks, increases hysteria and depression, and also results in discontinuous social relationships. The greatest current psychological burden reported within the study was stress. Within the systematic review by Dokras et al.[22], it was illustrated that symptoms of generalized anxiety were higher in PCOS ladies than in controls. Hence, diminished sexual satisfaction, adiposity, and concerns regarding body image and female identity, compounded by the presence of dermatological manifestations and hirsutism, are prevalent among individuals with PCOS. These factors may precipitate emotional distress, consistent with the observations of Simon et al.[23], McCook[24], and Stunkard et al.[25]. The study's findings align with prior research indicating that women diagnosed with polycystic ovary syndrome commonly experience negative perceptions of body image, characterized by dissatisfaction with appearance, perceived diminishment of attractiveness, feelings of unattractiveness, and heightened self-consciousness regarding appearance [26, 27].

Moreover, based on the existing literature regarding anxiety and depression in PCOS, it was determined that women with PCOS typically exhibit slightly heightened levels of anxiety and depression, findings that align with those observed in the current study. Cooney et al.[28] conducted a systematic review and meta-analysis, revealing a notable prevalence of anxiety ranging from moderate to severe among women with PCOS, a finding that diverges from the outcomes observed in our study. Results from Borghi et al.[29] revealed that people get anxious and worried about facing the world due to their body image. Their correlation analysis indicated a positive relationship of PCOS-related hirsutism with anxiety ($r=0.26$). Similar findings can be drawn from the present study. Females diagnosed with PCOS exhibit specific anxieties and harbor negative self-perceptions regarding their physical appearance. These interpersonal anxieties predispose them to social phobia and elicit feelings of anxiety. Divergent findings in existing literature underscore the variability in understanding the psychological burden experienced by individuals with PCOS. The research conducted by Himelein and Thatcher[30] regarding PCOS and mental health pointed to a significant association between PCOS and heightened psychological distress, negative body image, negative impact on sexual health, and reduced overall quality of life. These findings are consistent with multiple studies conducted by Bhattacharaya and Jha[31], Kerchner et al. [32], and Rasgon et al.[33].

Certain researchers propose that psychological morbidity may affect physiological aspects such as eating and sleeping patterns, psychological aspects such as motivation and feelings of worthlessness, and social aspects including interpersonal relationships. Therefore, the findings of the study align with the existing literature that corroborates the elevated level of psychological distress among PCOS-diagnosed women even after adjusting for considered confounding factors such as educational level and income, the risk of being affected by psychological distress is persistent.

Through the study, an investigation revealed elevated rates of both mild and severe depression among the PCOS group of participants in comparison to non-PCOS participants. Additionally, a higher proportion of PCOS-afflicted individuals exhibited moderate levels of anxiety and stress relative to their non-PCOS counterparts. This pattern aligns with findings from previous studies. A cross-sectional examination of PCOS women indicated a greater prevalence of severe anxiety compared to depression, with 36% of participants categorized as moderately to severely anxious. Similarly, within the PCOS group, the majority of individuals with depression reported mild symptoms, followed by moderate and severe presentations[34]. Thus, the findings of the study are consistent with the existing literature indicating that the incidence of psychological burden is higher among women with PCOS as compared to the general population. The study extends the findings of previous research that links PCOS and psychological distress by identifying the share of specific symptoms. Furthermore, these findings aid in comprehending the extent of distress experienced by women and its impact on their social interactions.

Limitations: Even though this paper has highlighted that PCOS women have a higher risk of psychological burden in comparison to normal women even after controlling the specific demographic variables there are some limitations. First, convenience sampling was used which limits the generalizability for patients suffering from different phenotypes of PCOS. Another limitation is the small sample size. Also, the study of patients with PCOS attending the adolescent clinic, at B.H.U. may limit the accurate representation of the population as a whole. Therefore, the interpretability of our findings is limited. Furthermore, cross-cultural differences, family type, socio-economic status, and comorbid conditions of the PCOS patients were also not explored in this study.

Conclusion

The findings underscore the heightened risk of depression, anxiety, and stress among individuals with polycystic ovary syndrome, independent of demographic factors. Present findings make it very clear that PCOS patients have greater chances of suffering from depression, anxiety, and stress in comparison to girls who don't have PCOS symptoms even after controlling the effects of demographic variables the PCOS group experiences considerable levels of high depression, anxiety, and stress in compared to girls without PCOS condition. The emotional distress experienced by women with PCOS may be associated, in part, with specific clinical manifestations of the condition such as obesity, hirsutism, acne, and menstrual irregularities. These elevate the psychological distress in females with PCOS, contributing to depression, anxiety, and poor self-esteem. This emphasizes the necessity for holistic care approaches integrating mental health interventions.

Recommendations

The present findings underscore the imperative for healthcare professionals to prioritize psychological well-being in PCOS management, particularly among young women. Hence, interventions for such patients must focus on various mental health issues emphasized in this paper. A multidisciplinary approach encompassing gynaecological, metabolic, and psychological assessments is essential. Early recognition and intervention for psychological distress in adolescents and young women can lessen long-term health risks and improve overall quality of life. As the trend has been seen adolescent groups of women are at higher risk for developing PCOS symptoms due to modernized and sedentary lifestyles. The recognition of the early psychological signs of PCOS at a young age and early treatment can prevent them from future major health problems and improve their quality of life. Thus, the implication of the present piece of work is to establish that PCOS women generally have a greater psychological burden in comparison to non-PCOS women and it is important for healthcare professionals working for patients to deal with their mental health, especially for young girls as they are creators of life.

Declaration of competing interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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