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Anthropometric Characteristics Of Polycystic Ovarian Syndrome In Obese Females At Shaikh Zaid Women Hospital, Larkana

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Abstract: Polycystic ovary syndrome (PCOS) is a common endocrine disorder that is present in approximately 7% of reproductive-age women. Polycystic ovary syndrome occurs in both normal-weight and overweight women, and obesity is a frequent comorbidity that often precedes the development of PCOS. Main objective of proposed study is to determine the frequency of polycystic ovarian syndrome in obese females. The descriptive cross-sectional study was conducted at the Department of Gynaecology, SMBBMU, Larkana over a period of six months from October 2022 to March 2023. The present study included 126 participants. The mean age was 24.69 ± 0.69 years (95% CI: 23.33–26.05), indicating early adulthood. The mean body weight was 73.46 ± 0.93 kg (95% CI: 71.62–75.30), mean height 1.68 ± 0.01 m (95% CI: 1.67–1.70), and mean BMI 25.93 ± 0.32 kg/m² (95% CI: 25.31–26.56), placing most participants in the overweight to obese category. Increased waist circumference was observed in 51 females (40.5%), highlighting central obesity as an important metabolic risk indicator beyond BMI. Menstrual disturbance showed a significant association with PCOS (p = 0.0343). Among women with PCOS, 7.9% reported menstrual disturbance, compared with 20.6% among those without PCOS, confirming a statistically significant relationship between PCOS status and menstrual irregularities. The polycystic ovarian syndrome is commonly prevalent in obese females.

Keywords:Females, Obese, Polycystic Ovarian Syndrome, Prevalence.

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INTRODUCTION

Polycystic ovary syndrome (PCOS) is the most common hormonal abnormality in reproductive-age women affecting 7% of this population [1]. The reproductive features of PCOS include increased androgen production and disordered gonadotropin secretion leading to menstrual irregularity, hirsutism and infertility [2]. In addition to these important reproductive manifestations, PCOS has metabolic characteristics that include prominent defects in insulin action and β cell function, defects that confer a substantially increased risk for glucose intolerance and type 2 diabetes [3,4]. Familial aggregation of PCOS strongly supports a genetic susceptibility to this disorder [5]. Obesity appears to be closely associated with PCOS and in the United States, more than half of the patients with PCOS are either overweight or obese [6,7]. It is well known that obesity influences the phenotypic expression of PCOS and might play a significant role in the pathophysiology of hyperandrogenism and chronic anovulation [8]. Increased adiposity is associated with several abnormalities of sex steroid metabolism and results in increased androgen production and suppression of sex-hormone binding globulin (SHBG) [9]. Furthermore, obese patients with PCOS have more severe cardiometabolic risk factors, compared with their lean counterparts [10]. Finally, it is noteworthy that even modest weight loss through diet interventions and increased physical activity has favorable effects on metabolic, endocrine, and reproductive outcomes in PCOS [11]. The reported prevalence of polycystic ovarian syndrome (PCO) in obesity is 20%, 61%, 52%, and 42% respectively [12-15].

MATERIALS AND METHOD

Study Design
Descriptive Cross-Sectional Study.

Sample Size
Taking the lowest prevalence of polycystic ovarian syndrome (PCOS) as 20% [12], d = 7%, 126 females were taken.

Sampling Technique
Non-Probability, Consecutive Sampling.

Sample Selection / Inclusion Criteria
All the females of 16–45 years of age either single or married had increase in weight (obesity) for six weeks duration presented in the Gynaecology outpatient department at Shaikh Zaid Women Hospital, Larkana.

Data Collection
The study was conducted over a period of six months from October 2022 to March 2023 after approval by CPSP and all women fulfilling the inclusion criteria were recruited and enrolled in the study. All the obese females visited the Gynaecology outpatient department (OPD) for weight concerns and opinions. The consent was taken from every woman with polycystic ovarian syndrome. The data was collected on pre-designed proforma and data were collected by the principal researcher under the supervision of the senior gynecologist.

Data Analysis
The data of all patients were analyzed in SPSS version 21.00. The frequency and percentage were calculated for the polycystic ovarian syndrome. The mean and standard deviation (SD) were calculated for age, weight, height and BMI. The post-stratification, Chi-square test was applied on categorical variables at 95% confidence interval (CI) and the p-value ≤0.05 was considered as statistically significant

RESULTS

The findings summarize the anthropometric parameters of the study participants. Data are presented using descriptive and inferential statistics to highlight the frequency and distribution of PCOS-related manifestations among the study population.

Table 1: Descriptive Statistics of Age among Obese Females with Polycystic Ovarian Syndrome

DESCRIPTIVE	Statistic	Std. Error
Mean	24.69	0.689
95% CI Lower Bound	23.33	
95% CI Upper Bound	26.05	
5% Trimmed Mean	24.17	
Median	22	
Variance	59.767	
Std. Deviation	7.731	
Minimum	16	
Maximum	45	
Range	29	
Interquartile Range	10	
Skewness	1.167	0.216
Kurtosis	0.221	0.428

The mean age of the participants was 24.69 ± 0.69 years. The 95% confidence interval (23.33–26.05 years) indicates that the true mean age of obese females affected by PCOS in this population lies within early adulthood, emphasizing the involvement of women in their reproductive years. The median age of 22 years and a 5% trimmed mean of 24.17 years suggest that the age distribution is not substantially influenced by extreme values. The observed standard deviation of 7.73 years reflects moderate variability in age among participants. Ages ranged from 16 to 45 years, highlighting that PCOS affects obese females across a wide reproductive age span, although younger women were more frequently affected. The positive skewness (1.17 ± 0.22) indicates a higher concentration of cases in the younger age groups, with relatively fewer older obese females presenting with PCOS. These findings indicate that PCOS is more commonly observed among young obese females, particularly in late adolescence and early adulthood.

Table 2: Descriptive Statistics of Weight among Obese Females with Polycystic Ovarian Syndrome

DESCRIPTIVE	Statistic	Std. Error
Mean	73.46	0.929
95% CI Lower Bound	71.62	
95% CI Upper Bound	75.30	
5% Trimmed Mean	73.22	
Median	70	
Variance	108.666	
Std. Deviation	10.424	
Minimum	55	
Maximum	101	
Range	46	
Interquartile Range	15	
Skewness	0.327	0.216
Kurtosis	-0.369	0.428

The mean body weight of the participants was 73.46 ± 0.93 kg. The 95% confidence interval for the mean weight ranged from 71.62 to 75.30 kg, indicating a consistently elevated body weight among the study population. The median weight was 70 kg, while the 5% trimmed mean was 73.22 kg, suggesting minimal influence of extreme values on the overall mean. The variability in weight was moderate, with a standard deviation of 10.42 kg. The minimum recorded weight was 55 kg, whereas the maximum was 101 kg. These findings demonstrate that the study population consisted predominantly of overweight to obese females, supporting the role of excess body weight as a significant contributing factor in the development and frequency of PCOS.

Table 3: Descriptive Statistics of Height among Obese Females with Polycystic Ovarian Syndrome

DESCRIPTIVE	Statistic	Std. Error
Mean	1.6843	0.00741
95% CI Lower Bound	1.6696	
95% CI Upper Bound	1.699	
5% Trimmed Mean	1.6842	
Median	1.675	

Variance	0.007	
Std. Deviation	0.08317	
Minimum	1.55	
Maximum	1.82	
Range	0.27	
Interquartile Range	0.15	
Skewness	-0.007	0.216
Kurtosis	-1.184	0.428

The mean height of the participants was 1.68 ± 0.01 m. The 95% confidence interval for the mean height ranged from 1.67 to 1.70 m, indicating a narrow and precise estimate of stature in the study population. Height variability was low, with a standard deviation of 0.08 m. The distribution of height was nearly symmetrical. These results indicate that height was relatively uniform among obese females with PCOS, suggesting that stature itself is unlikely to be a confounding factor in the observed obesity-related risk of PCOS.

Table 4: Descriptive Statistics of Body Mass Index among Obese Females with Polycystic Ovarian Syndrome

DESCRIPTIVE	Statistic	Std. Error
Mean	25.9308	0.31548
95% CI Lower Bound	25.3064	
95% CI Upper Bound	26.5552	
5% Trimmed Mean	25.8292	
Median	24.974	
Variance	12.54	
Std. Deviation	3.5412	
Minimum	20.29	
Maximum	33.75	
Range	13.46	
Interquartile Range	3.67	
Skewness	0.699	0.216
Kurtosis	-0.374	0.428

The mean Body Mass Index (BMI) of the participants was 25.93 ± 0.32 kg/m². The 95% confidence interval for the mean BMI ranged from 25.31 to 26.56 kg/m², confirming that the study population predominantly fell within the overweight to obese category. The median BMI was 24.97 kg/m². The BMI distribution exhibited positive skewness (0.70 ± 0.22), indicating a greater proportion of participants with higher BMI values. These findings support the strong association between increased BMI and the frequency of PCOS, underscoring the importance of weight reduction strategies and lifestyle modification.

Waist Circumference

Out of the total study participants, 51 females (40.5%) had an increased waist circumference, whereas 75 females (59.5%) had no increased waist circumference. Central obesity is a well-recognized risk factor for insulin resistance and hormonal imbalance, both of which play a crucial role in the pathophysiology of PCOS. The results highlight the importance of assessing waist circumference in addition to BMI when evaluating metabolic risk and PCOS frequency among obese females.

Table 5: Stratification of Menstrual Disturbance with Polycystic Ovarian Syndrome

MENSTRUAL DISTURBANCE	PCOS: Yes	PCOS: No	P-VALUE
Yes	10 (7.90%)	18 (14.30%)	0.0343
No	26 (20.60%)	72 (57.10%)	

Among women with PCOS, 10 (7.9%) reported menstrual disturbance, while 18 (14.3%) did not. In contrast, among women without PCOS, 26 (20.6%) had menstrual disturbance and 72 (57.1%) had no menstrual disturbance. The overall comparison between PCOS status and menstrual disturbance yielded a statistically significant p-value of 0.0343, indicating a statistically significant association between PCOS and menstrual disturbance ($p < 0.05$). This association is clinically relevant, as menstrual disturbance is a key diagnostic and symptomatic feature of PCOS

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DISCUSSION

Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders in premenopausal women, presenting with an overall 6.5% prevalence in premenopausal women from Spain, including lean, overweight, and obese patients as a whole [16]. The mean body weight of the participants was 73.46 ± 0.93 kg, and the mean BMI was 25.93 ± 0.32 kg/m², confirming the study population predominantly fell within the overweight to obese category. Out of the total study participants, 51 females (40.5%) had an increased waist circumference, highlighting the importance of assessing waist circumference in addition to BMI when evaluating metabolic risk. Obesity and polycystic ovary syndrome (PCOS) represent two common metabolic disorders that are associated with subfertility. According to the World Health Organization, in 2010, they estimated that 76.7% of females in the United States older than 15 years were considered overweight or obese (BMI > 25) [17–21]. Polycystic ovary syndrome appears to be one of the most common endocrine disorders in women [22], associated with significant reproductive, endocrine, metabolic, and cardiovascular morbidity [23]. When detected by sonography, polycystic ovaries are present in 14–23% of unselected women [24–27].

CONCLUSION

It is to be concluded that polycystic ovarian syndrome is commonly prevalent in obese females. The study revealed an overall tendency toward overweight and obesity, as reflected by elevated BMI and waist circumference. The high prevalence of central obesity, particularly among females, underscores its importance as a key metabolic risk factor beyond BMI alone. Among female participants, menstrual disturbance demonstrated a statistically significant association with PCOS, confirming the close link between PCOS status and menstrual irregularities. These findings highlight the interplay between adiposity, metabolic risk, and reproductive health, emphasizing the need for early screening and targeted interventions in young adults to prevent long-term metabolic and reproductive complications.

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Conflict of Interest: There is no conflict of interest.

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