

# A case-control study to assess the quality of life among patients diagnosed with polycystic ovarian syndrome in field practice area of a government medical college

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## ABSTRACT

### Background

Polycystic Ovary Syndrome (PCOS) is a common endocrine disorder among women of reproductive age, characterised by hyperandrogenism, ovulatory dysfunction, and polycystic ovaries. Beyond its reproductive and metabolic implications, PCOS can significantly impact psychological well-being, self-image, and overall quality of life. Understanding the extent of this impact is essential for the comprehensive management of women with PCOS.

### Methodology

A case-control study was conducted among women of reproductive age (18–49 years) to assess quality of life in women with PCOS. Cases were women diagnosed with PCOS using Rotterdam criteria (requiring 2 out of 3: hyperandrogenism, ovulatory dysfunction, polycystic ovaries on USG), while age-matched controls were women without PCOS or other chronic illnesses. A sample size of 280 cases and 280 controls (1:1 ratio) was calculated based on an expected control proportion of 0.1, an assumed odds ratio of 2, 95% confidence, and 80% power. Participants were recruited through house-to-house surveys in an urban field practice area. Data collection used the WHOQOL-BREF (26-item) pre-validated questionnaire. Data were analyzed using SPSS v28, with descriptive statistics (mean, SD, CI), Mann-Whitney U test for transformed scores, and Chi-square tests for categorical comparisons. Ethical approval was obtained, with confidentiality ensured and written informed consent collected from all participants.

### Results

The study observed that only 1.4% of cases rated their quality of life as excellent (5/5) compared to 6.4% of controls, a difference that was highly statistically significant ( $p < 0.001$ ). This indicates that cases were nearly 4.5 times less likely to report a high quality of life, reflecting a substantial compromise in perceived well-being among cases compared to controls.

### Conclusion

The study found that cases were much less likely than controls to rate their quality of life as excellent, indicating a significant decline in perceived well-being among cases.

**Keywords:** Polycystic ovary syndrome (PCOS), Quality of life, Oligomenorrhea, cases, controls

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## INTRODUCTION

Polycystic ovary syndrome (PCOS), the major endocrinopathy among reproductive-aged women, is not yet perceived as an important health problem in the world<sup>1</sup>. The patients with PCOS have clinical manifestations due to hyperandrogenism, anovulation, Amenorrhea, and Oligomenorrhea<sup>2</sup>, which lead to associated comorbidities like obesity, infertility, hirsutism, and acne<sup>3</sup>. The presence of this led to worrying (psychomotor effects). However, people are more concerned about how it manifests externally rather than what's happening internally. Previous studies have shown that Quality of life in PCOS patients is negatively affected<sup>3,4</sup>. Quality of life and PCOS disorder are integrated, as it is a non-curable disorder.

The prevalence of PCOS is variable due to a lack of a universal definition, and there is a limited amount of literature on previous research regarding the prevalence of PCOS dependent on a geographical location, specific race, or ethnicity, or how the prevalence of PCOS is related to the occurrence of additional health disparities. It affects 3.7%–22.5% of women of reproductive age worldwide<sup>5</sup>. The prevalence, diagnosis, aetiology, management, clinical practices, psychological issues, and prevention are some of the most confusing aspects associated with PCOS. Prevalence of PCOS in India ranges from 3.7 to 22.7 per cent, depending on the population studied and the criteria used for diagnosis<sup>3,4,5</sup>.

The review of literature on the proposed study revealed few studies concerning the National population and even fewer studies concerning the local population. Due to the paucity of literature in PCOS, we planned to do this study in our setting. This study aims to assess the quality of life in PCOS, so that treatment not only concentrates on decreasing the disorder's pathogenesis but also prioritises reducing external manifestations, such as obesity, hirsutism, and psychomotor manifestations, thereby improving quality of life.

The present study was proposed in the urban field practice area attached to the Urban Health Centre (UHC) under the Department of Community Medicine, Government Medical College, Srikakulam. The UHC has a population coverage of more than 35,000 people equipped with a Medical

Officer, Staff Nurse, Pharmacist, NM's, ASHA workers, and Health Mobilizers. The UHC provides Promotive, Preventive, and Curative services in the form of Immunisation, ANC clinics, Treatment of locally endemic diseases, and supports all National Health Programmes. The present study done in this setting gives a scope of understanding of this disease as it was not covered under any programme, but with high prevalence, which needs attention.

### Objective:

1. To assess the effect of Polycystic Ovary Syndrome (PCOS) on the quality of life among women of reproductive age.

### METHODOLOGY

Study design: case-control study

Study Population: women of reproductive age group

### Inclusion criteria:

- Women of the reproductive age group (>18 years-49years)
- Women diagnosed with PCOS
- Women who give consent.

**Sample size:** With an expected proportion of 0.1 in controls, an assumed odds ratio of 2, with a confidence level of 0.95 and a power of 0.8, the sample size calculated was 280 for cases and 280 for controls with a 1:1 case-to-control ratio.

**Sampling:** House to house survey in the urban field practice has been done until the sample size is attained.

### Study Tools:

In this study to assess the quality of life, a pre-validated questionnaire from the World Health Organization's Quality of Life Questionnaire (WHOQOL – BREF) was used. It is the abbreviated 26-item version of the WHOQOL-100. The WHOQOL-Bref is a frequently used instrument to assess the quality of life in both healthy and ill populations. Inquiries of the psychometric properties of the WHOQOL-Bref report indicate that the validity and reliability are generally satisfactory<sup>10</sup>. It has been recommended for use among women with reproductive morbidities, especially gynaecological morbidities.

**Data analysis:** The data was analyzed using SPSS version 28.0. A sample of 280 cases and 280 controls were analyzed as per the study objectives. Descriptive characteristics were expressed in the

form of Mean, Standard deviation, with confidence interval. The transformed scores were tested for significance using Mann Whitney U test. Cross tabulation was done with the application of Chi-square for testing statistical differences among cases and controls.

Ethical considerations: The Study was conducted after getting approval from the IEC. Confidentiality of the patient is protected by masking the personal details of the patient. Written informed consent will be obtained from the study participant.

Operational definition of case:

Rotterdam criteria: A diagnostic criterion for PCOS: Diagnosis confirmed by the presence of 2 out of 3 criteria (Only if other conditions mimicking PCOS are absent. PCOS is a diagnosis of exclusion)

1. Hyperandrogenism.
2. Ovulatory dysfunction: Oligomenorrhea

/secondary amenorrhea.

### 3. Polycystic ovary on USG

- Ovarian follicles >10cc.
- > 12 follicles
- Size of follicles = 2-9mm in size.

Controls: Age-matched controls without PCOS and with no other communicable diseases /chronic illness.

## RESULTS

In the present study, 280 cases and 280 controls were studied. Figure 1 depicts that on applying the Mann-Whitney U test, it was observed that the Mean transformed score of cases was 423 with a standard deviation of 60423±60 (416-430 with 95%CI) and controls was 457±66 (449-464 with 95%CI) .

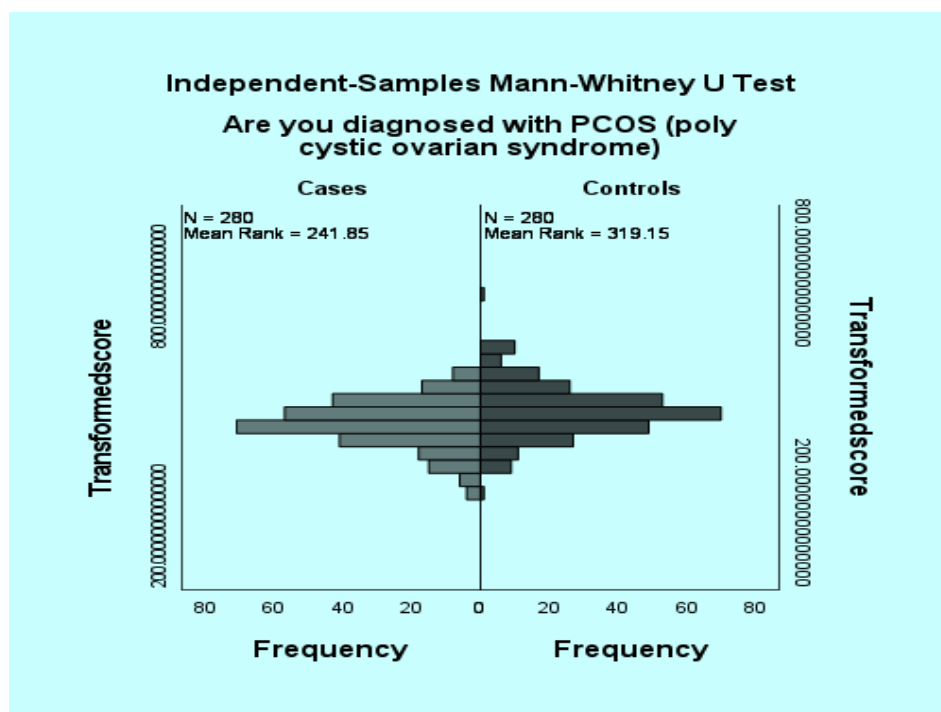
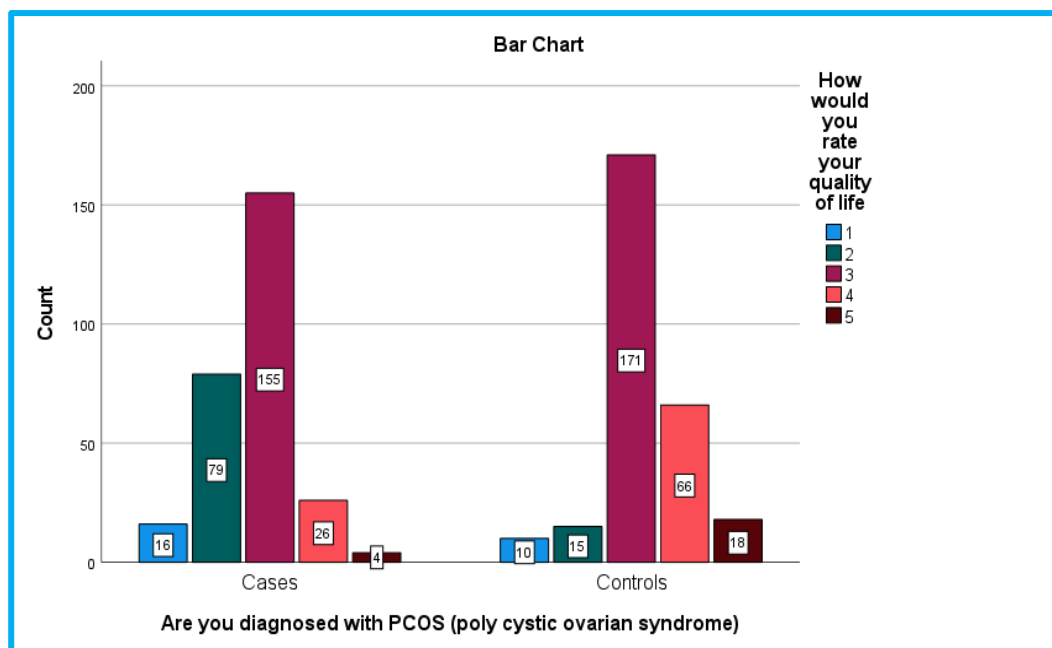
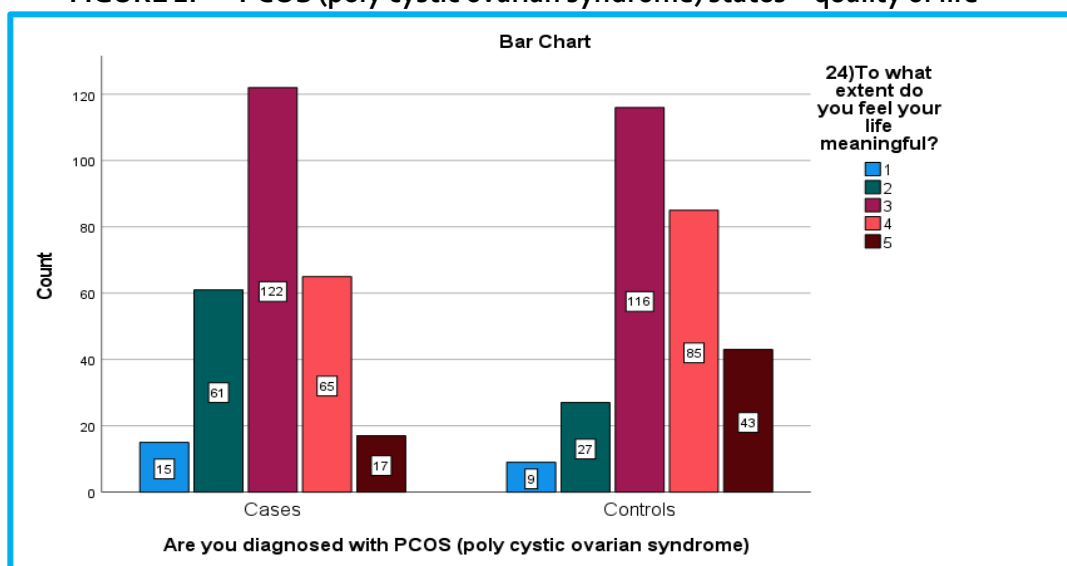


FIGURE 1: INDEPENDENT SAMPLE SCORES TESTED WITH MANN - WHITNEY U-TEST



**FIGURE 2: PCOS (poly cystic ovarian syndrome) status \* quality of life**



**FIGURE 3: PCOS (poly cystic ovarian syndrome) status \* To what extent do you feel your life meaningful?**

Figure 2 depicts that on a 1-5 scale, 1.4% of the cases gave a rating of 5 for quality of life, whereas 6.4% of

controls gave a rating of 5 for the same. It was found to be highly statistically significant. ( $p < 0.001$ ).

**TABLE 1: PCOS (poly cystic ovarian syndrome) status \* How satisfied are you with your sleep?**

Rating score		1	2	3	4	5	Total
Cases	Count	19	61	111	82	7	280
	Percentage	6.8%	21.8%	39.6%	29.3%	2.5%	100.0%
Control	Count	15	43	107	90	25	280

	Percentage	5.4%	15.4%	38.2%	32.1%	8.9%	100.0%
Total	Count	34	104	218	172	32	560
	Percentage	6.1%	18.6%	38.9%	30.7%	5.7%	100%

8.9% of the controls are satisfied to an extreme amount with their sleep, whereas in cases it is 2.5% for the same. 6.8% are not at all satisfied with their sleep, while it is 5.4% in controls, which was found to be statistically significant. ( $p=0.007$ ). Compared to controls, women with PCOS reported significantly lower satisfaction with their health and sleep ( $p<0.001$ ,  $p=0.007$ ). Only 9.3% of cases were very satisfied with their health versus 23.9% of controls,

and extreme satisfaction was much lower in cases (0.7% vs 6.8%). For sleep, only 2.5% of cases were extremely satisfied compared to 8.9% of controls, with a higher proportion in cases reporting dissatisfaction. No significant difference was found regarding the impact of physical pain on daily activities ( $p=0.251$ ). Both groups reported similar moderate energy levels (51.8%), yet this was statistically significant ( $p<0.001$ ).

**TABLE 2: PCOS (poly cystic ovarian syndrome) status\* How satisfied are you with your ability to perform your daily living activities?**

Rating score		1	2	3	4	5	Total
Cases	Count	15	61	121	79	4	280
	Percentage	5.4%	21.8%	43.2%	28.2%	1.4%	100.0%
Control	Count	8	42	160	61	9	280
	Percentage	2.9%	15.0%	57.1%	21.8%	3.2%	100.0%
Total	Count	23	103	281	140	13	560
	Percentage	4.1%	18.4%	50.2%	25.0%	2.3%	100%

57.1% of controls are moderately satisfied with their ability to do their daily living activities, and it is 43.2% in cases. It was found to be statistically significant. ( $p=0.004$ ). Only 8.5% of controls enjoy their life to an extreme amount, while it is 0.7% among cases. It was found to be highly statistically significant. ( $p<0.001$ ). Women with PCOS reported significantly lower moderate concentration levels (43.2% vs 52.1%,  $p=0.049$ ) and were less satisfied with themselves (3.6% vs ~14%,  $p<0.001$ ) compared to controls. Satisfaction with bodily appearance was lower in cases (28.9% vs 42.1% at a score of 3; 3.2% vs ~13% extreme satisfaction,  $p<0.001$ ). Negative feelings such as anxiety and depression were reported more by cases (10% vs 4.3%,  $p=0.002$ ).

Additionally, fewer cases reported moderate ability to get around compared to controls (42.1% vs 53.3%,  $p<0.001$ ). Women with PCOS reported lower moderate satisfaction in daily living activities (43.2% vs 57.1%,  $p=0.004$ ) and needed nearly twice the medical help for daily functioning compared to controls ( $p<0.001$ ). None of the cases reported extreme satisfaction with work capacity (vs 2.1% controls), and moderate satisfaction was lower in cases (56.1% vs 61.4%,  $p<0.001$ ). Satisfaction with personal relationships (25.7% vs 33.2%) and support from friends (29.6% vs 43.2%) was significantly lower in cases ( $p<0.001$ ). Feelings of safety were also lower in cases, both for extreme (half of controls) and moderate levels (35.4% vs 46.1%,  $p<0.001$ ).

Women with PCOS reported significantly lower extreme satisfaction with their living conditions (~6 times lower,  $p=0.012$ ), financial situation (1.4% vs 4.3%,  $p<0.001$ ), and opportunity for leisure (0% vs 3.2%,  $p<0.001$ ) compared to controls. Satisfaction with access to healthcare was lower among cases for moderate satisfaction (42.9% vs 52.7%,  $p<0.001$ ). Cases rated lower satisfaction with availability of

information (more cases rating it low: 25.4% vs 12.5%,  $p=0.002$ ), felt less satisfied with their physical environment (moderate: 47.5% vs 57.1%; extreme: 0.7% vs 2.5%,  $p<0.001$ ), and had lower satisfaction with transport (17.9% vs 22.9%,  $p<0.001$ ). Fewer cases felt their life was extremely meaningful compared to controls (~6.1% vs ~18%,  $p<0.001$ ).

**TABLE 3: PCOS (poly cystic ovarian syndrome) \* How Satisfied are you with the conditions of your living place?**

Rating score		1	2	3	4	5	Total
Cases	Count	31	51	114	79	5	280
	Percentage	11.1%	18.2%	40.7%	28.2%	1.8%	100.0%
Control	Count	16	52	123	71	18	280
	Percentage	5.7%	18.6%	43.9%	25.4%	6.4%	100.0%
Total	Count	47	103	237	150	23	560
	Percentage	8.4%	18.4%	42.3%	26.8%	4.1%	100%

6.4% are extremely satisfied with their living conditions, while it is almost 6 times less in cases. It

was found to be statistically significant. ( $p=0.012$ ).

**TABLE 4: PCOS (poly cystic ovarian syndrome) status\* Have you enough money to meet your needs?**

Rating score		1	2	3	4	5	Total
Cases	Count	8	68	142	58	4	280
	Percentage	2.9%	24.3%	50.7%	20.7%	1.4%	100.0%
Control	Count	27	29	152	60	12	280
	Percentage	9.6%	10.4%	54.3%	21.4%	4.3%	100.0%
Total	Count	35	97	294	118	16	560
	Percentage	6.3%	17.3%	52.5%	21.1%	2.9%	100%

4.3% cases are satisfied to an extreme amount with their finance to meet their needs, while it is only

1.4% in cases. It was found to be highly statistically significant. ( $p<0.001$ ).

**TABLE 5: PCOS (poly cystic ovarian syndrome) status \* How satisfied are you with the access to health care services?**

Rating score		1	2	3	4	5	Total
Cases	Count	9	80	120	57	14	280
	Percentage	3.2%	28.6%	42.9%	20.4%	5.0%	100.0%
Control	Count	7	39	147	76	11	280
	Percentage	2.5%	14.0%	52.7%	27.2%	3.6%	100.0%
Total	Count	16	119	267	133	25	580
	Percentage	2.9%	21.3%	47.8%	23.8%	4.3%	100%

5% of cases felt that they are extremely satisfied with their access to the health care services while it is less in controls of 3.6% for the same but controls 52.7% are moderately satisfied with the health care

services compared to 42.9% among the cases for the same. It was found to be highly statistically significant. ( $p < 0.001$ ).

**TABLE 6: PCOS (poly cystic ovarian syndrome) status\* How available to you is the information that you need in your day-to-day life**

Rating score		1	2	3	4	5	Total
Cases	Count	11	71	146	43	9	280
	Percentage	3.9%	25.4%	52.1%	15.4%	3.2%	100.0%
Control	Count	11	36	156	67	10	280
	Percentage	3.9%	12.9%	55.7%	23.9%	3.6%	100.0%
Total	Count	22	107	302	110	19	560
	Percentage	3.9%	19.1%	53.9%	19.6%	3.4%	100%

25.4% of cases rated availability of information on a 2 in 1-5 scale, where it is only 12.5% in controls. It was

found to be statistically significant. ( $p = 0.002$ ).

**TABLE 7: PCOS (poly cystic ovarian syndrome) status \* How healthy is your physical environment?**  
Crosstabulation

Rating score		1	2	3	4	5	Total
Cases	Count	5	95	133	45	2	280
	Percentage	1.8%	33.9%	47.5%	16.1%	0.7%	100.0%
Control	Count	11	45	160	57	7	280
	Percentage	3.9%	16.1%	57.1%	20.4%	2.5%	100.0%
Total	Count	16	140	293	102	9	560
	Percentage	2.9%	25.0%	52.3%	18.2%	1.6%	100%

Physical environment is felt healthy to a moderate amount by 47.5% of cases while it is 57.1% cases. It is felt to a n extreme amount by 2.5% in controls

which is only 0.7% in cases. It was found to be highly statistically significant. ( $p < 0.001$ ).

**TABLE 8: PCOS (poly cystic ovarian syndrome) status \* How satisfied are you with your transport?**  
Crosstabulation

Rating score		1	2	3	4	5	Total
Cases	Count	12	89	125	50	4	280
	Percentage	4.3%	31.8%	44.6%	17.9%	1.4%	100.0%
Control	Count	19	52	129	64	16	280
	Percentage	6.8%	18.6%	46.1%	22.9%	5.7%	100.0%
Total	Count	31	141	254	114	20	560
	Percentage	5.5%	25.2%	45.4%	20.4%	3.6%	100%

22.9 % of the controls are very much satisfied with transport, while it is 17.9% in cases. It was found to

be highly statistically significant. ( $p < 0.001$ ).



**TABLE 9:PCOS (poly cystic ovarian syndrome) status \* To what extent do you feel your life meaningful?**

Crosstabulation		1	2	3	4	5	Total
Cases	Count	15	61	122	65	17	280
	Percentage	5.4%	21.8%	43.6%	23.2%	6.1%	100.0 %
Control	Count	9	27	116	85	43	280
	Percentage	3.2%	9.6%	41.4%	30.4%	15.4%	100.0 %
Total	Count	24	88	238	150	60	560
	Percentage	4.3%	15.7%	42.5%	26.8%	10.7%	100%

Only 6.1 per cent of cases felt their life meaningful to an extreme amount when compared to controls, which is 3 times higher; it was found to be highly statistically significant. ( $p < 0.001$ ).

## Discussion

### Quality of life

In the present study, only 1.4% of cases rated their quality of life at the highest level (5 on a 1–5 scale), whereas 6.4% of controls reported a rating of 5 for the same. It was found to be highly statistically significant, suggesting the lower quality of life among cases when compared with controls. ( $p < 0.001$ ). Similar studies conducted worldwide have recorded similar findings. Patients with PCOS reported significantly lower Quality of life, measured with the German version of the SF-36. The SF-36, or 36-Item Short Form Health Survey, is a patient-reported questionnaire used to assess health-related quality of life. Compared with controls, women with PCOS had significantly decreased scores, indicating lower quality of life, on the scales of physical role function [PCOS  $71 \pm 37$ ; controls  $90 \pm 21$  (mean  $\pm$  SD)], bodily pain [PCOS  $73 \pm 30$ ; controls  $85 \pm 26$  (mean  $\pm$  SD)], vitality [PCOS  $43 \pm 20$ ; controls  $60 \pm 20$  (mean  $\pm$  SD)], social function [PCOS  $66 \pm 30$ ; controls  $80 \pm 27$  (mean  $\pm$  SD)], emotional role function [PCOS  $49 \pm 44$ ; controls  $87 \pm 27$  (mean  $\pm$  SD)], and mental health [PCOS  $53 \pm 20$ ; controls  $70 \pm 18$  (mean  $\pm$  SD)].<sup>6</sup>

### Bodily appearance

In the present study, 42.1% controls rated their bodily appearance as 3 on a 1-5 scale, while it was only 28.9% in cases for the same. 3.2% of cases are extremely satisfied with their bodily appearance, while it is 4 times higher in controls. It was found to be highly statistically significant. ( $p < 0.001$ ). Four studies compared scores on the physical role function dimension in women with PCOS and controls. Women with PCOS had significantly lower values (MD,  $-5.76$ ; 95% CI,  $-8.49$ ,  $-3.03$ ;  $P < .0001$ ).<sup>7,8,9,10</sup>

### Body pain

About 1.8% of cases in the present study believe that physical pain prevents them from doing what they need to an extreme amount, whereas 3.6% of controls felt the same. It was not found to be statistically significant. ( $p = 0.251$ ). Elsenbruch S, Hahn S, Kowalsky D, in a study has reported scores on the body pain dimension in women with PCOS and controls. Women with PCOS had significantly lower values (MD,  $-4.55$ ; 95% CI,  $-7.99$ ,  $-1.11$ ;  $P = 0.01$ ), without heterogeneity among studies ( $P = 0.08$ ).<sup>7,8</sup>

### General health

A study done by Drosdzol A et al revealed scores on the general health dimension in women with PCOS and controls. Women with PCOS had significantly lower values (MD,  $-11.34$ ; 95% CI,  $-19.53$ ,

-3.15;  $P=0.007$ ). In the present study, 23.9% of the controls are very much satisfied with their health, while it is only 9.3% in cases. An extreme amount of satisfaction is seen only in 0.7% cases, while in controls it is a little better at 6.8%. It was found to be highly statistically significant. ( $p<0.001$ ).<sup>8,9</sup>

### Social function

A study done by Hahn S et al scores on the social function dimension in women with PCOS and controls. Women with PCOS had significantly lower values (MD, -15.95; 95% CI, -18.57, -13.33;  $P<0.00001$ ) when compared to those in our study, 53.3% of controls said that they are fine with their social functional ability, and it is only 42.1% in cases. It was found to be highly statistically significant. ( $p<0.001$ ).<sup>9</sup>

### Emotional role function

A study done by Li Y et al reported scores on the emotional role function dimension in women with PCOS and controls. Women with PCOS had significantly lower values (MD, -23.86; 95% CI, -27.51, -20.21;  $P<0.00001$ ). 10% cases in our present study say that they have an extreme amount of negative feelings, such as blue mood, despair, anxiety, depression, while it is only 4.3% in controls. It was found to be statistically significant. ( $p=0.002$ ).<sup>10</sup> The study found that overall satisfaction with health, sleep, enjoyment of life, self-satisfaction, bodily appearance, personal relationships, support from friends, feelings of safety, living conditions, finances, leisure opportunities, physical environment, and transport was significantly higher among controls compared

to cases, with many showing highly statistically significant differences ( $p<0.001$ ). Cases reported higher extreme negative feelings and a greater need for medical help for daily functioning, also with high statistical significance. Moderate satisfaction in energy levels, concentration, mobility, ability to perform daily living activities, and access to healthcare services was generally higher in controls. Physical pain preventing activities was not significantly different between groups ( $p=0.251$ ). Availability of information was rated lower by cases, and satisfaction with healthcare services showed mixed levels but remained significantly different. In summary, controls demonstrated consistently better quality of life indicators and satisfaction across multiple domains compared to cases, with most findings being statistically significant, reflecting a clear disparity in perceived well-being and functioning.

### Conclusion

The study observed that only 1.4% of cases rated their quality of life as excellent (5/5) compared to 6.4% of controls, a difference that was highly statistically significant ( $p<0.001$ ). This indicates that cases were nearly 4.5 times less likely to report a high quality of life, reflecting a substantial compromise in perceived well-being among cases compared to controls.

### Recommendation

Given the evidence generated in the present study, the Quality of life of PCOS cases should be assessed and considered in a multifaceted strategy in the management of PCOS.

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