

## Access this article online

Quick Response Code:



Website:  
www.jehp.net

DOI:  
10.4103/jehp.jehp\_21\_23

# Assessment of quality of life in patients having Poly-Cystic Ovarian Syndrome: A cross-sectional facility-based study

Ishwarpreet Kaur, Amarjeet Singh<sup>1</sup>, Vanita Suri<sup>2</sup>, Kamal Kishore<sup>3</sup>, Satya Vati Rana<sup>4</sup>, Nancy Sahni<sup>5</sup>, Sudip Bhattacharya<sup>6</sup>

Department of Community Medicine and School of Public Health, Postgraduate Institute of Medical Education and Research (PGIMER),

Chandigarh, India,

<sup>1</sup>Department of Community Medicine and School of Public Health, Postgraduate

Institute of Medical Education and Research (PGIMER), Chandigarh, India,

<sup>2</sup>Department of Obstetrics and

Gynecology, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India, <sup>3</sup>Department

of Biostatistics, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India, <sup>4</sup>Department

of Gastroenterology, Postgraduate

Institute of Medical Education and Research (PGIMER), Chandigarh, India, <sup>5</sup>Department

of Dietetics, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India, <sup>6</sup>Department

of Community and Family Medicine, All India Institute of Medical Sciences (AIIMS), Deoghar, Jharkhand, India

## Address for correspondence:

Dr. Sudip Bhattacharya, Assistant Professor, Department of Community and Family Medicine, All India Institute of Medical Sciences (AIIMS), Deoghar, Jharkhand, India.

E-mail: docbilu@gmail.com

Received: 06-01-2023

Accepted: 12-04-2023

Published: 30-06-2023

## Abstract:

**BACKGROUND:** Polycystic ovarian syndrome (PCOS) is a complex and heterogeneous disorder affecting various body organs. Menstrual irregularity, anovulation, and many cosmetic issues faced by PCOS patients endanger the essence of being a woman and may have a deleterious impact on their health-related quality of life (HRQOL). This study aimed to assess HRQOL in patients with PCOS and to identify the clinical and socio-demographic factors that might predict poor HRQOL.

**MATERIALS AND METHODS:** This cross-sectional study was carried out in the tertiary care hospital in India. A total of 275 women visiting the same setting and diagnosed with PCOS were included. The participants' quality of life was studied using a disease-specific HRQOL questionnaire. Information regarding clinical and socio-demographics was collected using the interviewer schedule. For evaluating the predictors of HRQOL in PCOS subjects, analysis of variance and independent *t*-test was applied. For subgroup analysis, the post hoc (Gabriel) test was applied.

**RESULTS:** The average total score of HRQOL of the study participants was  $125.41 \pm 29.1$ . The lowest weighted mean score was for menstrual problems. Among the socio-demographic variables, age and educational level influenced the HRQOL scores. Highly educated women reported the poorest HRQOL. The analysis of variance also indicated a significant variation in HRQOL scores among body mass index categories [ $F(4,270) = 5.09, P = <.001$ ] and hirsutism status [ $F(2,272) = 14.222, P = <.001$ ].

**CONCLUSIONS:** Menstrual irregularity, hirsutism, increased body mass index, educational status, and age are critical in altering HRQOL in PCOS cases. Clinicians should inquire about the HRQOL of patients with severe clinical manifestations and appropriate support must be provided during patient care.

## Keywords:

Analysis of variance, endocrine disorder, health-related quality of life, hirsutism, hyperandrogenism, polycystic ovarian syndrome, women's health

## Introduction

Polycystic ovarian syndrome (PCOS) is a complex and heterogeneous disorder affecting various body organs.<sup>[1]</sup> The etiology of the disease is still not clear. But it has been documented that genes

and environment play a crucial role in onset of this disorder.<sup>[2,3]</sup> With the change in our lifestyles, the prevalence is reaching epidemic proportions in India. In Indian women of reproductive age group, its prevalence rate is between 3.7% and 22.5%.<sup>[4]</sup> As per Rotterdam

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 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.

For reprints contact: WKHLRPMedknow\_reprints@wolterskluwer.com

**How to cite this article:** Kaur I, Singh A, Suri V, Kishore K, Rana SV, Sahni N, *et al.* Assessment of quality of life in patients having Poly-Cystic Ovarian Syndrome: A cross-sectional facility-based study. *J Edu Health Promot* 2023;12:190.

criteria, the most commonly accepted and used for PCOS, a diagnosis is confirmed if any two of the three features (hyperandrogenism, oligomenorrhea or anovulation, and polycystic ovaries) are present in a woman of reproductive age.<sup>[5,6]</sup> The primary problem with women having PCOS is their hormonal imbalance, which affects many organs. In PCOS, the production of androgen hormones may increase. Decrease in sex hormone binding globulin may also occur resulting in elevated level of free testosterone. Most PCOS patients manifest insulin resistance. Apart from this, high luteinizing hormone levels, normal or low follicular stimulating hormone, and an abnormal luteinizing hormone to follicular stimulating hormone ratio may also be seen.<sup>[2]</sup> Clinical feature of PCOS includes menstrual problems or anovulation, hirsutism, insulin resistance, obesity, and infertility. If not managed properly, PCOS can increase the risk of long-term morbidities like metabolic and cardiovascular disorders, reproductive complications (miscarriage, premature delivery), and psychological ailments (anxiety, depression).<sup>[7,8]</sup> Menstrual irregularity and many cosmetic issues faced by PCOS patients may cause frustration, embarrassment, and increased stress in them. In married women, the fear of infertility may cause additional concerns. PCOS essentially endangers the essence of being a woman. This may further result in psychological issues.<sup>[9]</sup> A constant state of stress and worry can compromise sleep, eating, and exercise routine and overall quality of life (QOL) of women with PCOS.

Research has shown that the QOL is also impacted by the socio-economic status.<sup>[10]</sup> Nonetheless, this association is yet to be studied in detail in females with PCOS.

Many different questionnaires are used to study the QOL of PCOS patients. However, a disease-specific questionnaire (Polycystic Ovary Syndrome Health-Related Quality of Life Questionnaire, PCOSQ) was designed to measure QOL concerning the specific phenotype of PCOS.<sup>[11]</sup> The tool has good reliability and increased sensitivity in comparison to generic tools.<sup>[12]</sup> The questionnaire was modified (modified-Polycystic Ovary Syndrome Health-Related Quality Of Life Questionnaire, m-PCOSQ) with four questions on acne to improve its validity.<sup>[13]</sup>

This research aimed to assess the health-related quality of life (HRQOL) among Indian patients with PCOS and to identify the clinical and socio-demographic factors that might predict poor HRQOL. A better understanding and clarity about HRQOL will help clinicians and public health researchers to develop targeted health promotional strategies and interventions for women suffering from PCOS.

## Materials and Methods

### Study design and setting

This cross-sectional study was designed and conducted in a tertiary care hospital in North India from 2016 to 2018. Women with PCOS visiting the Gynaecology OPD of PGIMER, Chandigarh, India were included in the study.

### Participants and sampling

The study included willing female cases between 18 and 40 diagnosed with PCOS per Rotterdam criteria.<sup>[5]</sup>

The exclusion criteria included the presence of diabetes mellitus, abnormal thyroid function, abnormal prolactin levels, or any serious concomitant illness.

The calculated sample size was 256, which was enhanced to 275 to cover for nonresponse (alpha 0.05 and power 80%,  $P = 0.20$ ).

### Data collection tool and technique

The QOL of the participants was studied using disease-specific HRQOL questionnaire. The information regarding socio-demographic and disease features (hirsutism, infertility, obesity, and menstrual irregularity) was also collected.

Interviewer schedule was used to collect data on socio-demographic and anthropometric characteristics, symptoms, menstrual pattern, and obstetric history. For evaluating hirsutism, modified Ferriman Gallwey tool was used.

The m-PCOSQ was used to get a self-assessment of the HRQOL. PCOSQ is an instrument that was specifically designed and validated to evaluate HRQOL in PCOS. The instrument consists of 26 questions in five domains that had the highest impact to women with PCOS: body hair, emotions, infertility, weight, and menstrual problems. Each item is associated with a seven-point Likert scale, in which a score of 7 suggests no problems or difficulties and 1 indicates maximum HRQOL impairment on that item. Lower scores on the PCOSQ indicate poorest functioning.<sup>[11]</sup> The m-PCOSQ has an additional acne domain with four extra questions.<sup>[13]</sup>

**Data analysis:** The HRQOL score was presented as mean [standard deviation (SD)] and for the six subscales of the PCOSQ weighted mean (SD) were given. Descriptive analysis using mean (SD) and number (%) was used as appropriately for presenting other variables under study. For analyzing the association of socio-demographic profile and HRQOL of respondents and evaluating the predictors of HRQOL in PCOS subjects, analysis of variance (ANOVA) and independent *t*-test was

applied. For subgroup analysis, post hoc (Gabriel) test was applied. SPSS Statistics (version 22.0) software was used for analysis.

**Ethical consideration**

Ethical approval (Ref No. INT/IEC/2015/616, dated 13.10.2015) was taken from the institute’s ethics committee PGIMER, Chandigarh, India. A written informed consent was obtained from all subjects/ patients.

**Results**

The average total score of HRQOL of the study participants was  $125.41 \pm 29.1$ . The scores ranged from 43 to 199. Figure 1 depicts the weighted mean scores, which were lowest for the domain of menstrual problems, followed by hirsutism and weight issues. These three main problems affect the HRQOL most among PCOS girls.

Table 1 reveals no significant difference in the mean HRQOL score of the respondents except for the education and age variables.

The HRQOL scores among PCOS females of different age groups were significantly different [F (3,271) = 5.58, P =0.001] [Table 1]. Post hoc comparisons using the Gabriel test indicated that the mean score for PCOS females between 18 and 20 years of age group (M = 134.58) were significantly different in comparison to 21-25 years of age group females (M = 119.15, P =0.002). Also, the HRQOL score among 21-25 years of age group females (M = 122.92) was different from the 31-40 years of age group (M = 135.48, P =.027) [Figure 2].

Unmarried females between 18 and 20 years of age were 98.5% (n = 67), while just one female (1.5%) was married in this age category.

In age category of 21-25 years, 75.6% (n = 90) females were unmarried. Among remaining (24.4%) married women, nine females had no infertility, while 20 had infertility.

Fewer females were unmarried (26.2%, n = 16) in age between 26 and 30 years. Infertility issues were faced by 28 (45.9%) married females. Among females, more than 31 years of age group 22.2% (n = 6) were unmarried. Of married 77.8%, 13 females had no infertility complaint, while eight had infertility problem.

Means for the total HRQOL scores were significantly different among the females with different education level as per a one-way ANOVA [F (3, 271) = 2.89, P =0.036] [Table 1]. Pair wise comparisons of the means using Gabriel test procedure indicated that the mean score (M = 118.61, SD = 29.55) of HRQOL of the postgraduates was significantly different (P =0.036) from those of participants with education level of senior secondary (M = 132.05, SD = 27.25). The other comparisons were not significant [Figure 3].

The QOL scores were lowest among the most educated group.

Table 2 shows no difference in means among unmarried PCOS respondents and married respondents with or without infertility [F (3,271) = 0.711, P =0.546], while other variables showed significant difference in HRQOL among different symptoms.

The mean HRQOL scores among females with normal menstrual cycle length and abnormal cycle length were significantly different (P =0.013) [Table 2].

As per the body mass index (BMI) categorization, only 17.5% of the subjects were normal weight, 3.6% were underweight, and remaining (79%) were overweight and obese. A one-way

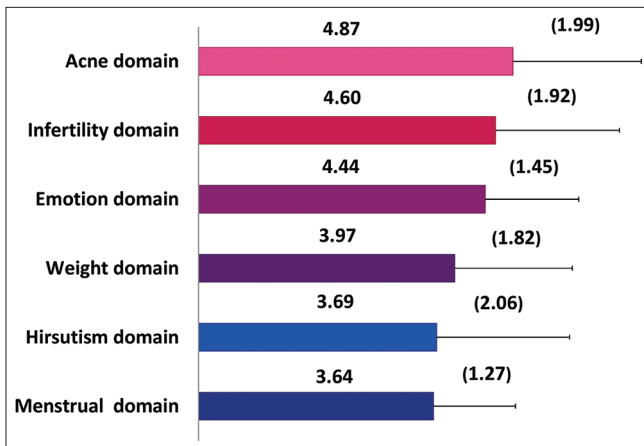


Figure 1: Mean of domain wise HRQOL weighted mean scores of 275 study participants

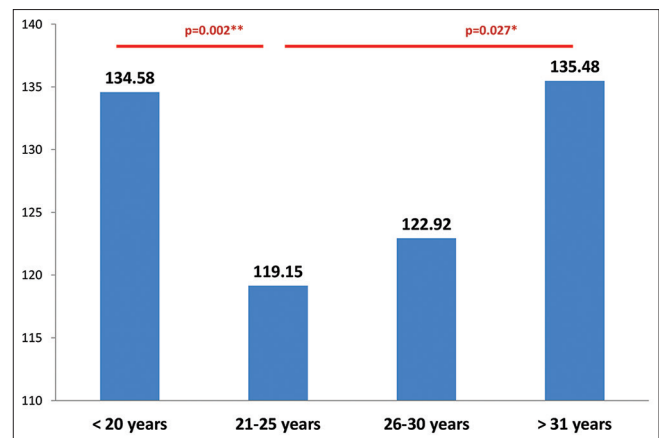
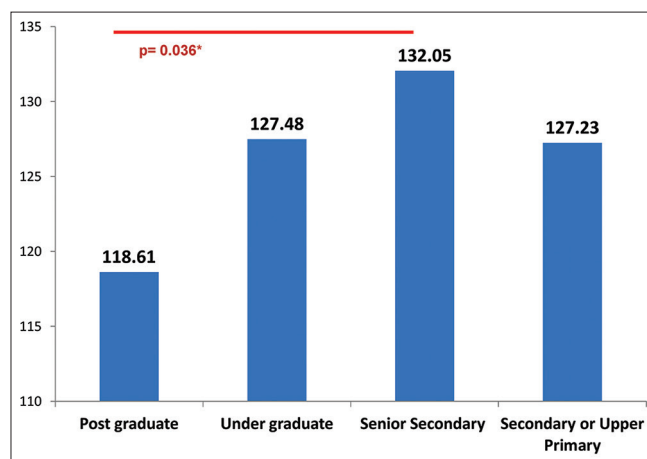


Figure 2: Comparison between the mean HRQOL scores among females of different age groups

**Table 1: Association between socio-demographic characteristics and quality of life of respondents (n=275)**

Variables	n (%)	HRQOL score Mean (SD)	P	95% CI
Religion				
Hindu	160 (58.2)	125.5 (29.5)	0.937	120.9-130.1
Others <sup>□</sup>	115 (41.8)	125.2 (28.8)		119.9-130.6
Marital status				
Unmarried	179 (65.1)	125.7 (29.7)	0.818	121.3-130.1
Married <sup>°</sup>	96 (34.9)	124.9 (28.1)		119.2-130.5
Family type				
Nuclear	192 (69.8)	124.9 (29.3)	0.675	120.8-129.1
Joint	83 (30.2)	126.5 (28.8)		120.2-132.8
Age Group (years)				
<20	68 (24.7)	134.6 (27.5)	0.001**	127.9-141.2
21-25	119 (43.3)	119.2 (29.5)		113.8-124.5
26-30	61 (22.2)	122.9 (28.3)		115.6-130.1
>31	27 (9.8)	135.5 (25.9)		125.2-145.7
Education				
Post graduate	92 (33.5)	118.6 (29.6)	0.036*	112.5-124.7
Under graduate	106 (38.5)	127.5 (28.9)		121.9-133.1
Senior Secondary (11 <sup>th</sup> -12 <sup>th</sup> )	55 (20.0)	132.1 (27.3)		124.7-139.4
Secondary (9 <sup>th</sup> -10 <sup>th</sup> ) or Upper Primary (6 <sup>th</sup> -8 <sup>th</sup> ) <sup>∇</sup>	22 (8.0)	127.2 (28.7)		114.5-139.9
Employment status				
Employed	67 (24.4)	124.1 (26.3)	0.686	117.7-130.5
Unemployed and Housewife*	77 (28.0)	123.8 (28.5)		117.4-130.3
Student	131 (47.6)	127.0 (30.9)		121.7-132.4
Income (per capita monthly income) <sup>#</sup>				
Rs. 6,261 and more (upper class)	147 (53.5)	124.4 (31.2)	0.188	119.4-129.5
Rs. 3,099-6,260 (upper middle class)	65 (23.6)	125.5 (26.6)		118.9-132.1
Rs. 1,835-3,098 (middle class)	35 (12.7)	120.7 (26.1)		111.8-129.7
Rs. <1,834 <sup>##</sup> (Lower, middle, and below)	28 (10.2)	136.0 (25.6)		126.1-145.9

<sup>□</sup>In others category 5 were Muslims and 1 Christian. <sup>°</sup>One subject was married but separated <sup>∇</sup>Only 3 went to Upper Primary (6<sup>th</sup>-8<sup>th</sup>). <sup>\*</sup>13 (4.7%) subjects were unemployed, and rest were housewives. <sup>#</sup>BG Prasad socioeconomic classification for 2016- Income (per capita monthly income). <sup>##</sup>23 subjects were in category Rs. 949-1,834 (lower middle class), while 5 subjects were in Rs. <948 category (lower class). \*P value significant at <0.05, \*\* P value significant at <0.01



**Figure 3:** Comparison between the mean HRQOL scores among females with different educational level

between-subjects ANOVA was conducted to compare the effect of BMI on the QOL in normal, overweight, obese I, and obese II conditions. There was a statistically significant difference between the means of HRQOL scores among PCOS females under different BMI categories as determined by one-way ANOVA [F (4,270) = 5.09,  $P = <.001$ ] [Table 2].

A Gabriel post hoc test revealed that the mean HRQOL scores among underweight PCOS females ( $M = 147.4$ ) were significantly different from obese I and II category females ( $M = 119.6$ ,  $P = 0.009$  and  $M = 121.6$ ,  $P = 0.030$ , respectively). In addition, HRQOL scores among normal weight PCOS cases ( $M = 136.6$ ) were also significantly different from obese I category females ( $M = 119.6$ ,  $P = .005$ ) and obese II category females ( $M = 121.6$ ,  $P = .041$ ) shown in Figure 4.

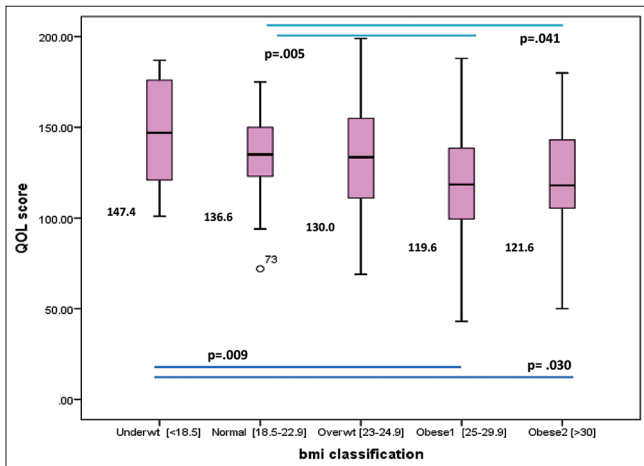
The difference in PCOS-HRQOL scores among females reporting hirsutism severity (measured by modified Ferriman Gallwey score) as compared using one-way ANOVA. Of total 275 respondents, 51 had no hirsutism, while 224 reported hirsutism. The 224 subjects were further categorized as mild hirsutism ( $n = 124$ ) and moderate or severe hirsutism ( $n = 100$ ).

The means of the HRQOL scores among three levels of hirsutism severity were unequal as per a one-way ANOVA [F (2,272) = 14.222] as shown in Table 2.

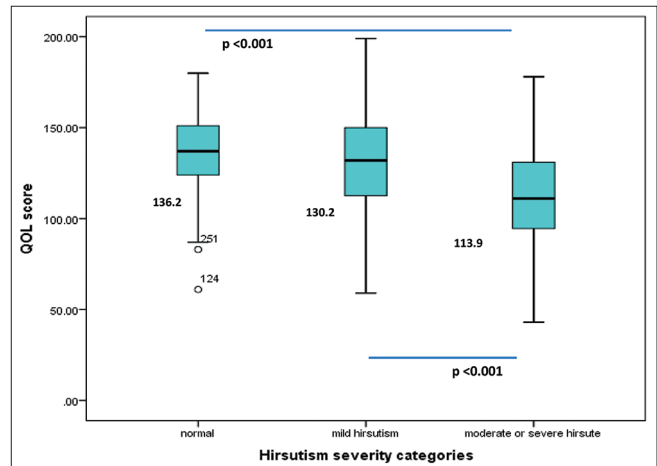
Pair-wise comparison of the means using Gabriel's post hoc test indicated a significant difference ( $P <.001$ ) in

**Table 2: Predictors of quality of life in PCOS respondents (n=275)**

BMI, clinical and psychological profile variables	n (%)	HRQOL score Mean (SD)	P	F	95% CI
<b>BMI</b>					
Underweight (<18.5)	10 (3.6)	147.4 (28.3)	<0.001***	5.1	127.2-167.6
Normal (18.5-22.9)	48 (17.5)	136.6 (23.9)			129.7-143.5
Over-weight (23-24.9)	34 (12.4)	130.0 (31.2)			119.7-140.9
Obese I (25-29.9)	108 (39.3)	119.6 (29.3)			113.9-125.2
Obese II (>30)	75 (27.2)	121.6 (27.9)			115.2-128.0
<b>Fertility status</b>					
Unmarried	179 (65.1)	125.7 (29.7)	0.546	0.7	121.3-130.1
Married (no infertility)	40 (14.5)	129.8 (29.9)			120.3-139.4
Married (primary infertility)	39 (14.2)	120.5 (23.9)			112.8-128.3
Married (secondary infertility)	17 (6.2)	123.1 (32.2)			106.5-139.6
<b>Hirsutism severity</b>					
Normal	51 (18.5)	136.2 (25.2)	<0.001***	14.2	129.1-143.3
Mild hirsutism	124 (45.1)	130.2 (27.5)			125.3-135.1
Moderate or severe hirsutism	100 (36.4)	113.9 (29.4)			108.1-119.8
<b>Menstrual cycle length</b>					
Normal <sup>□</sup>	56 (20.4)	133.9 (28.2)	0.013*	2.5	2.3-19.3
Abnormal <sup>□□</sup>	219 (79.6)	123.2 (29.0)			



**Figure 4:** Multiple comparisons between the HRQOL scores among different BMI categories



**Figure 5:** Multiple comparison between the HRQOL scores among different severity hirsutism groups

HRQOL among female with no hirsutism (M = 136.2) and moderate or severe hirsutism (M = 113.9). Similarly, differences in the mean HRQOL scores among mild hirsute female (M = 130.2) and moderate or severe hirsute female (M = 113.9) were significant at  $P < .001$  [Figure 5].

### Discussion

Our study tried to simultaneously assess HRQOL in patients with PCOS and identify the clinical and socio-demographic factors that might predict poor HRQOL.

PCOS is generally known as the “thief of beauty and womanhood”.<sup>[13]</sup> Girls affected by PCOS face different reproductive, metabolic, and cosmetic problems related to PCOS, which become a source of worry for them. The typical cosmetic issues with PCOS are hirsutism, obesity, acne, baldness, and pimples. Other symptoms include menstrual

irregularity, infertility, etc. Because of the physical changes in the body, there is a negative effect on girls. They feel guilty about their body. They remain unhappy all the time. Due to such symptoms, many of them are frustrated and stressed out.<sup>[14,15]</sup> This impacts their QOL.<sup>[16,17]</sup>

The extent of the impact on HRQOL will depend on the associated symptoms, their degree or intensity, and various socio-demographic factors. In our study, cases were also found to have poor HRQOL.

Past studies incorporating PCOSQ have revealed more impairment in specific health-related domains.<sup>[18-20]</sup> Excess weight has been reported as a major concern for poor QOL in females with PCOS.<sup>[19,21]</sup> In our study, comparing all the domains, the respondents were greatly impacted by menstrual irregularity.

A study conducted in Iran (2013) also showed that HRQOL was most affected by menstrual problems.<sup>[17]</sup> The difference in the degree of impairment for each domain impairment could be attributed to religious, cultural, social, and demographic factors.<sup>[18]</sup>

Menstrual irregularity is not visible to others; nevertheless, it significantly impacted the HRQOL due to these possible reasons. Generally, a woman tends to plan her life activities like outdoor activities, vacations, or strenuous work as per her monthly cycle. Menstruation becomes a central issue in her life. So, irregular menses may disturb all her plans and create disproportionate stress. Married females may face difficulty in having a baby. Also, in our society, nonoccurrence of menses or missed periods indicates pregnancy. Nowadays, even young adolescent girls reporting with amenorrhea in hospitals, even due to PCOS, have to undergo pregnancy tests. This troubles them and their parents a lot. So, PCOS disturbs their family equation also.

In PCOS, women have hyperandrogenism. This can result in male pattern hair growth and weight gain. Consequently, they lose confidence in themselves.<sup>[22]</sup> Our study results showed that hirsutism was the second major problem that had a negative impact on health-related HRQOL in PCOS patients followed by weight issues. Females with moderate or severe hirsutism had the overall poorest QOL in comparison to females with no or mild hirsutism. As the severity of the hirsutism increased, the QOL was lowered. Facial hair was the major concern for the females greatly impacting their lives. Similarly, the females who were obese had most poor overall QOL in comparison to normal weights and underweights.

PCOS can affect females any time in their reproductive age group. As the age of menarche in girls is reducing, more and more young girls are diagnosed and being labelled as PCOS. The impact of the disease and coping with the condition varies among females of different age groups. Our study showed that the females in age categories 18-20 years and 31-40 years had the highest overall HRQOL scores, which means that PCOS had a lesser effect on their HRQOL than other age groups. Such findings may be due to many reasons.

Most females between 18 and 20 years of age were unmarried and had a better HRQOL. This could be due to the carefree attitude of this age group. For them, menses are bothersome and a burden. This is due to inconvenience caused during menses, like pain, nausea, weakness, indigestion, irritability, etc. Besides this, the stress of changing sanitary napkins, their disposal, and the tension of period leaks make it further problematic. The social norms and taboos associated with the

menstrual cycle make it a hassle for young females. Also, the females who are young or less educated are generally ignorant and unaware of the association of menses with reproduction.

In our study, the majority (77.8%) of females aged more than 31 years were married. Of these, around 60% had no infertility complaint. Most females are married, financially independent, and settled in life during this age. As per our societal norms, females are considered to have achieved almost everything if they are married and had kids. The changes in weight or appearance may only bother them a little.

Females aged 21-25 years had the lowest HRQOL scores. In this age group, the majority of females were unmarried (75.6%), and among the remaining (24.4%) married females, majority reported infertility problems. Fewer females were unmarried (26.2%) between age 26 and 30 years. Of the married women, infertility issue was faced by 45.9% of married females. This group had the second lowest scores of HRQOL. The females aged between 21 and 30 years are more worried about their looks and menstrual regularity, as most of them are yet to get married in this age range. Appearance is a crucial factor in finding a future husband. If the menstrual cycle is not regular, they are even more worried as they fear infertility issues after marriage. The fear of infertility drives the patients to seek treatment.

Similarly, for married females, infertility issue is a significant concern. Their marriages are in crisis if they fail to give birth. The stress increases proportionally as the years of marriage increased.

Our study also reported that the females with highest education level (postgraduate) had the poorest overall HRQOL. In contrast, females with education up to higher secondary had the highest overall HRQOL score, which corresponds to better HRQOL. This shows that PCOS had the most negative impact on girls with higher education.

The higher educated women may have higher expectations. They are more worried about things like getting jobs, securing the future, and marriage. While the less educated may have lesser expectations; their awareness and knowledge about their health condition could also be less. However, this aspect needs to be studied further.

**Limitations:** The limitations of the study might stem from patients' reporting bias. The generalizability of our results is another limitation, as the study was conducted in a single tertiary hospital. Third, despite the strong relationships between the severity of symptoms and

HRQOL, the cross-sectional studies restrict the causality of these relationships.

**Conclusion:** This study concludes that the lowest weighted mean HRQOL score was for menstrual problems, followed by hirsutism and weight issues. Among the socio-demographic variables, age and educational level influenced the HRQOL scores. Highly educated women reported the most poor HRQOL. HRQOL of females with PCOS worsens with the severity of symptoms. The findings of this study would provide a better understanding of HRQOL. They will help pave the way for clinicians and public health researchers to develop targeted health promotional strategies and interventions for women suffering from PCOS.

### Acknowledgments

The authors sincerely express their gratitude to all the study patients who gave their time and commitment. And also, for written consent with complete patience.

### Ethical clearance

Obtained from IEC of PGIMER (INT/IEC/2015/616, dated 13.10.2015).

### Consent

A written informed consent was obtained from all subjects/patients.

### Financial support and sponsorship

Dr. Ishwarpreet Kaur was supported by the Indian Council of Medical Research, New Delhi (fellowship grant number: 3/1/3/JRF-2013/HRD-040 (10175), dated 10.09.2013) for doing her Ph.D.

### Conflicts of interest

There are no conflicts of interest.

## References

1. 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.
2. Dumesic DA, Oberfield SE, Stener-Victorin E, Marshall JC, Laven JS, Legro RS. Scientific statement on the diagnostic criteria, epidemiology, pathophysiology, and molecular genetics of polycystic ovary syndrome. *Endocr Rev* 2015;36:487-525.
3. Diamanti-Kandarakis E, Christakou C, Marinakis E. Phenotypes and environmental factors: Their influence in PCOS. *Curr Pharm Des* 2012;18:270-82.
4. Ganie MA, Vasudevan V, Wani IA, Baba MS, Arif T, Rashid A. Epidemiology, pathogenesis, genetics & management of polycystic ovary syndrome in India. *Indian J Med Res* 2019;150:333-44.
5. Rotterdam ESHRE/ASRM-Sponsored PCOS Consensus Workshop Group. Revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome. *Fertil Steril* 2004;81:19-25.
6. Evidence-based Methodology Workshop on Polycystic Ovary Syndrome (PCOS) [Internet]. <https://www.nichd.nih.gov/>. 2012 [cited 2023 Apr 25]. Available from: <https://www.nichd.nih.gov/newsroom/resources/spotlight/112112-pcos>
7. Sills E, Perloe M, Tucker M, Kaplan C, Genton M, Schattman G. Diagnostic and treatment characteristics of polycystic ovary syndrome: Descriptive measurements of patient perception and awareness from 657 confidential self-reports. *BMC Womens Health* 2001;1:3.
8. Ehrmann D. Polycystic ovary syndrome. *N Engl J Med* 2005;352:1223-36.
9. Moran LJ, Hutchison SK, Norman RJ, Teede HJ. Lifestyle changes in women with polycystic ovary syndrome. *Cochrane Database Syst Rev* 2011:CD007506. doi: 10.1002/14651858.CD007506.pub2.
10. Keyvanara M, Khasti BY, Zadeh MR, Modaber F. Study of the relationship between quality of life and socioeconomic status in Isfahan at 2011. *J Edu Health Promot* 2015;4:92.
11. Cronin L, Guyatt G, Griffith L, Wong E, Azziz R, Futterweit W, et al. Development of a health-related quality-of-life questionnaire (PCOSQ) for women with polycystic ovary syndrome (PCOS). *J Clin Endocrinol Metab* 1998;83:1976-87.
12. Jones GL, Benes K, Clark TL, Denham R, Holder MG, Haynes TJ, et al. The Polycystic Ovary Syndrome Health-Related Quality of Life Questionnaire (PCOSQ): A validation. *Hum Reprod* 2004;19:371-7.
13. Kitzinger C, Willmott J. 'The thief of womanhood': Women's experience of polycystic ovarian syndrome. *Soc Sci Med* 2002;54:349-61.
14. Deeks AA, Gibson-Helm ME, Teede HJ. Anxiety and depression in polycystic ovary syndrome: A comprehensive investigation. *Fertil Steril* 2010;93:2421-3.
15. Weiss TR, Bulmer SM. Young women's experiences living with polycystic ovary syndrome. *J Obstet Gynecol Neonatal Nurs* 2011;40:709-18.
16. Morshedi T, Salehi M, Farzad V, Hassani F, Shakibzadeh E. The status of relationship between coping strategies and quality of life in women with polycystic ovary syndrome. *J Edu Health Promot* 2021;10:185.
17. Bazarganipour F, Ziaei S, Montazeri A, Foroozand F, Faghihzadeh S. Health-related quality of life and its relationship with clinical symptoms among Iranian patients with polycystic ovarian syndrome. *Iran J Reprod Med* 2013;11:371-8.
18. Schmid J, Kirchengast S, Vytiska-Binstorfer E, Huber J. Infertility caused by PCOS – health-related quality of life among Austrian and Moslem immigrant women in Austria. *Hum Reprod* 2004;19:2251-7.
19. McCook JG, Reame NE, Thatcher SS. Health-related quality of life issues in women with polycystic ovary syndrome. *J Obstet Gynecol Neonatal Nurs* 2005;34:12-20.
20. Khomami MB, Tehrani FR, Hashemi S, Farahmand M, Azizi F. Of PCOS symptoms, hirsutism has the most significant impact on the quality of life of Iranian women. *PLoS One* 2015;10:e0123608.
21. Barnard L, Ferriday D, Guenther N, Strauss B, Balen AH, Dye L. Quality of life and psychological well being in polycystic ovary syndrome. *Hum Reprod* 2007;22:2279-86.
22. Aliasghari F, Mirghafourvand M, Charandabi SM-A, Lak TB. The predictors of quality of life in women with polycystic ovarian syndrome. *Int J Nurs Pract* 2017;e12526.