

## The quality of life of women suffering from polycystic ovary syndrome

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### ABSTRACT

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**Purpose:** To assess how certain clinical symptoms of polycystic ovary syndrome (PCOS) affect the quality of life of women, their activity, and their sexual lives.

**Materials and methods:** The World Health Organization quality of life questionnaire (WHOQOL-Bref) was used to assess the quality of life and health of 78 women diagnosed with PCOS, and the female sexual function questionnaire -28 (FSQ-28) was used to assess their sexual activity and associated disorders.

**Results:** Among three groups of women with varying body mass indexes and aged 26.93 years on average, significant differences ( $p < 0.05$ ) were found in quality of life. In individual domains of the WHOQOL-Bref, the median score of women with obesity was lower than that of women with normal body weight or with overweight. Women with

symptoms of hirsutism showed lower quality of life than women without these symptoms, while women who had undergone treatment for 4–6 years experienced significantly worse quality of life than those who had undergone therapy for less than 3 or more than 6 years. In the various domains of sexual response, regression analysis showed a positive correlation ( $p < 0.05$ ) between better quality of life and women's sexual activity.

**Conclusions:** Clinical symptoms of PCOS such as obesity and hirsutism affect women's quality of life, as does the length of infertility treatment, whereas general quality of life affects the occurrence of disorders in women at particular stages of sexual response.

**Key words:** polycystic ovary syndrome, women, quality of life

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## **INTRODUCTION**

Polycystic ovary syndrome (PCOS) is classified amongst the endocrine disorders occurring in women in the reproductive period. The frequency of its occurrence in this group of women varies between 6 to 10% [1,2]. Its pathogenesis has not yet been conclusively explored. It is believed to result from complex interactions between genetic, behavioral, and environmental factors [1,3,4].

Mutations of several genes are important pathogenic factors; they are involved in the synthesis of steroid hormones as well as regulation of gonadotropin, insulin signal, and body weight. The environmental factors contributing to PCOS in women with genetically determined insulin resistance are mainly weight gain and obesity [1,4].

Women suffering from PCOS exemplify a variety of clinical symptoms such as: menstrual disorders (53-66%), problems conceiving (42-73%), hirsutism (65%), obesity (35-38%); whereas about 20% of women do not experience any characteristic symptoms [1,2,5].

The clinical symptom of PCOS has a huge negative impact on the individual's psychological and interpersonal functioning [1,6]. Also, infertility, which often accompanies PCOS, is a source of anxiety, sleep disorders, feelings of helplessness, guilt, hurt, and difficulty maintaining interpersonal relationships. Moreover, the treatment process is associated with many invasive procedures, as well as a kind of objectification of the sexual act, which can lead to communication and sexual problems between partners [5,6].

Few studies have undertaken the issue of the functioning of women with PCOS. However, there is empirical evidence that the accompanying changes in the body's appearance and reproductive organ dysfunctions can affect women's sense of self and lead to frustration, depression, and problems with self-acceptance [1,5,6].

The aim of this research was to assess the influence of selected clinical symptoms of PCOS on the quality of life of women, their activity, and sexual life.

## **MATERIALS AND METHODS**

The project obtained approval from the Ethics Committee of the Medical University of Lublin.

249 patients of the Infertility Treatment Clinic in Lublin participated in this study in the period between January 2014 and December 2014. From within this group, 78 women diagnosed with PCOS were chosen, and the resulting research material is presented in this paper. A three-part questionnaire constituted the research method. The first part pertained to personal information, menarche, reproductive history (number of

pregnancies, labors, miscarriages), menstrual disorders, the time of PCOS diagnosis and the occurrence of excessive hair growth on the chin and abdomen starting from the symphysis pubis to the navel and/or from the navel to the thoracic cage. Depending on the presence as well as the character of excessive hair growth in the aforementioned regions, the participants of the study received, in accordance with the Ferriman-Gallwey score, between 1 to 4 points, for one in every three of the examined regions. The sum of points, according to this scale, higher or equal to 3 indicates the occurrence of hirsutism, whereas 0-2 – its lack. This part of the questionnaire involved questions about the weight and height [7].

The second part consisted of the WHOQOL-Bref questionnaire, which is used in the assessment of quality of life of both healthy individuals as well as sick patients in clinical practice. The first question evaluated the individual overall perception of one's quality of life, the second the individual satisfaction perception of one's health, while the rest concerned the following domains of quality of life, and its functioning:

- physical; assessed: activities of daily living, dependence on pharmaceuticals and medical help, energy and tiredness, mobility, pain and discomfort, sleep and rest, efficiency at work;
- psychological; assessed: appearance, negative emotions, positive emotions, self-assessment, spirituality, religion, individuality, faith, thinking, studying, memory, concentration;
- social relationships; assessed: personal relations, social support, and sexual activity;
- environment; assessed: financial situation, freedom, safety and physical protection, health and social care – availability and quality, the surroundings of the house, the availability of gaining new information and abilities, participation in activities and the availability of recreation/recreational activities, physical environment (pollution /movement/climate), transport.

The answers are evaluated on a 5-point scale (points ranging between 1-5). One can receive a maximum of 20 points within each of the domains. The results of the particular spheres have a positive direction – the greater the number of points, the greater the quality of life.

The third part consisted of a questionnaire of sexual activity and sex life (FSQ-28). It is aimed at women at different stages in their lives with varying states of health. The questions regarding sexual activity (amounting to 26) refer to the preceding four weeks only. Whereas, the others refer to the physical and emotional relationship with one's partner. The FSQ-28 questionnaire allows for the diagnosis of sexual disorders within the particular stages of a woman's sexual reaction (desire, sensation of arousal, lubrication, emotional arousal,

orgasm) and the dysfunctions associated with pain, foreplay (enjoyment), and relations with one's partner.

In the evaluation of the parameters of the FSQ-28 scale, there are particular stages of the sexual reaction, which suggest their normal functions or the occurrence of sexual disorders. The results of the particular domains have a positive direction – the greater the amount of points, the better the quality of sexual life – the absence of sexual dysfunctions.

The body mass assessment was carried out on the basis of height and the body weight, by calculating BMI (*Body Mass Index*), which is the ratio of the body weight in kg to the height in m<sup>2</sup>. The criterion of obesity was defined at BMI 30 and more, overweight between 25.1-29.9, and normal body mass 19-25.

The participants were informed of the study's aim, the criteria of being included, and its course beforehand.

Patients gave their consent to participate in the study. After the formal agreement, the patients were asked to fill in the questionnaire. Any ambiguities arising from the questions included in the questionnaire as well as the method of their interpretation were immediately explained. During the study, each patient's hair growth was assessed using the Ferriman-Gallwey score. Special care was taken to ensure an intimate and friendly atmosphere during the examination.

The study inclusion criteria were: diagnosis with PCOS in accordance with the Rotterdam criteria, infertility treatment for at least 1 year, and patient's consent to participate in the study. The Rotterdam criteria are widely used for diagnosis. These criteria require that patients have at least two of the following conditions: hyper-androgenism, ovulatory dysfunction, and polycystic ovaries.

The exclusion criteria were: diagnosed hormonal and metabolic disorders not linked to the occurrence of PCOS, such as: hyperprolactinemia, thyroid disorders, and adrenal hyperplasia.

Twenty-eight patients refused to participate in the study, approximately 30% of those who had been approached and asked to participate in the study.

### Statistical analysis

Calculations were performed using Statistica 10.0 software (StatSoft, Poland). Each constant variable was assessed depending on its distribution. Variables whose distribution deviated from normal, and for which homogeneity of variance was not confirmed, were analyzed using non-parametric methods. The Mann-Whitney test was used to compare two continuous variables. For testing differences among three independent groups, the Kruskal-Wallis test was used. In addition, we used analysis of variance and Tukey's post hoc test.

Correlations between different ordinal scales were analyzed using Spearman's correlation matrices. We assumed a level of  $p < 0.05$  as relevant.

## RESULTS

The average age of the respondents was 26.93. The largest group (52; 66.67%) consisted of women between 20–30 years, one of the participants was over 40 years old, while the rest (25; 32.05%) were between 31-40 years old. The majority of women were married (54; 69.23%), the rest were single women or divorcees (24; 30.77%). Most women had a higher-level of education (56; 71.79%), and the remainder had a high school (19; 24.35) or trade school education (3; 3.86%).

The average duration of PCOS, from the moment it was diagnosed, was  $5.76 \pm 4.70$  years. Treatment duration was: 1 to 3 years for 29 (37.2%) participants, 6 years for 27 (34.61%), and 4 to 6 years for 22 (28.19%).

Hirsutism was diagnosed in 54 (69.23%) participants according to the Ferriman-Gallwey score. Average BMI (*Body Mass Index*) in the studied groups was  $24.68 \pm 4.52$ . Over half of the examined women (46; 58.97%) had normal body weight (BMI 19-25), one in four respondents (21; 26.92%) were overweight (BMI 26-30), and one in ten (14.11%) obese (BMI  $>30$ ). Age of menarche within the studied group of women was on average  $12.86 \pm 1.56$  years. Menstruations occurred on average every  $36.40 \pm 7.80$  days.

The majority of the participants (52; 66.67%) had never been pregnant. The remaining 26 respondents (33.33%) had been pregnant, out of which: in 16 (61.54%) participants, the pregnancy had been successfully carried to the end; in 5 (19.23%) necrosis had occurred, in 5 (19.23%) spontaneous abortion had taken place.

The data referring to the quality of life of women, assessed with the WHOQOL-Bref test, are presented in Table 1, which shows the results of the overall assessment of quality of life, satisfaction with health, and functioning in the physical, psychological, social relationships, and environment domains.

The overall quality of life of the participants of this study (assessed on a scale from 1 to 5) was 4.00; the satisfaction with health was slightly lower (3.00). Whereas, the assessment of the particular spheres of life (on a scale from 1 to 20) has shown that physical functioning (15.43) and social relationships (14.67) were assessed the highest.

Functioning in the environment was assessed slightly lower (13.50), while psychological functioning was assessed as the lowest (12.00).

Table 2 presents the perception of quality of life in various spheres depending on the

women's body mass according to BMI (normal body weight, overweight, and obese).The median of the individual domains of the WHOQOL-Bref in women with obesity was lower than in the group with normal body weight and overweight. We observed statistically significant differences (p

<0.05) in quality of life among the three studied groups with varying BMI.

Differences in the assessment of quality of life between patients with symptoms of hirsutism and those not showing any such symptoms are presented in Table 3.

**Table 1.** The quality of life of women suffering from PCOS in particular spheres assessed using the WHOQOL-Bref test

<b>The study of the sphere of quality of life (WHOQOL-Bref test)</b>	<b>Min - Max</b>	<b>Me</b>
Overall quality of health rating	1.00 – 5.00	4.00
Satisfaction with health	1.00 – 5.00	3.00
Physical	5.71- 19.43	15.43
Psychological	8.00 – 19.33	12.00
Social relationships	5.33 – 20.00	14.67
Environment	9.50 – 19.00	13.50

WHOQOL-Bref: test is a shorter version of the original WHOQOL (World Health Organization Quality of Life) questionnaire; Min – Max: the values obtained from minimum to maximum; Me – median

**Table 2.** The study of the sphere of quality of life and the assessment of body mass

<b>The study of the sphere of quality of life (WHOQOL-Bref test)</b>	<b>Body Mass Index (BMI)</b>						<b>Statistical analyses</b>	
	<b>Normal n=46; 58.97%</b>		<b>Overweight n=21; 26.92%</b>		<b>Obesity n=11; 14.11%</b>			
	<b>Min –Max</b>	<b>Me</b>	<b>Min –Max</b>	<b>Me</b>	<b>Min –Max</b>	<b>Me</b>	<b>H</b>	<b>P-value</b>
Overall quality of health rating	1-5	4.00	1-5	3.00	1-4	3.00	13.46	0.001
Satisfaction with health	1-5	3.00	1-4	2.00	1-3	1.50	10.75	0.005
Physical	7.56 - 19.43	16.57	5.71 - 19.88	15.43	5.71 – 17.42	13.14	14.88	0.001
Psychological	8.00 – 19.33	12.67	8.00 – 19.05	12.67	8.00-15.38	10.33	8.12	0.024
Social relationships	5.36 – 20.00	16.00	5.33 – 19.24	14.67	5.33- 17.50	12.67	7.07	0.033
Environment	9.50 – 19.00	13.50	9.50 – 18.68	13.50	9.50-17.25	11.00	8.05	0.021

WHOQOL-Bref test is a shorter version of the original WHOQOL (World Health Organization Quality of Life) questionnaire; Min – Max - the values obtained from minimum to maximum; Me – median; H – Kruskal-Wallis Test

**Table 3.** Quality of life and the occurrence of the symptoms of hirsutism

<b>The study of the sphere of quality of life (WHOQOL-Bref test)</b>	<b>Hirsutism</b>				<b>Statistical analyses</b>	
	<b>Yes n= 24; 30.76 %</b>		<b>No n= 54; 69.23%</b>			
	<b>Min –Max</b>	<b>Me</b>	<b>Min –Max</b>	<b>Me</b>	<b>Z</b>	<b>p-value</b>
Overall quality of health rating	1.00 – 5.00	3.00	1.00 – 5.00	4.00	-2.70	0.010
Satisfaction with health	1.00 – 4.00	2.00	1.00 – 5.00	3.00	1.39	0.172
Physical	5.71- 19.43	14.86	7.25 - 19.43	16.00	2.50	0.013
Psychological	8.00 – 19.00	12.00	8.00 – 19.33	12.67	2.22	0.035
Social relationships	5.33 – 18.36	14.67	6.33 – 20.00	16.00	2.22	0.035
Environment	9.50 – 18.00	12.50	9.50 – 19.00	13.50	2.70	0.021

WHOQOL-Bref test is a shorter version of the original WHOQOL (World Health Organization Quality of Life) questionnaire; Min – Max - the values obtained from minimum to maximum; Me – median; Z – Mann-Whitney Test

In women with symptoms of hirsutism, we observed lower quality of life in the individual domains compared with women without symptoms of hirsutism ( $p < 0.05$ ). Respondents' satisfaction with health was not statistically dependent on symptoms of hirsutism ( $p = 0.172$ ).

Table 4 presents data on the quality of life of the studied female patients taking into consideration duration of infertility treatment as a result of PCOS.

**Table 4.** The quality of life of the participating women and duration of infertility treatment

The study of the sphere of quality of life (WHOQOL-Bref test)	Duration of treatment ≤ 3 years n=29; 37.20%		Duration of treatment 4 - 6 years n= 22; 28.19%		Duration of treatment ≥6 years n=27; 34.61%		Statistical analyses	
	Min- Max	Me	Min- Max	Me	Min- Max	Me	H	p-value
Overall quality of health rating	1.00 – 5.00	4.00	1.00 – 4.00	3.00	1.00 – 5.00	4.00	4.66	0.101
Satisfaction with health	1.00 – 4.00	3.0	1.00 – 3.00	2.00	1.00 – 5.00	3.00	7.91	0.023
Physical	6.00- 19.43	16.00	5.71- 18.43	13.71	6.41- 19.43	16.00	8.05	0.020
Psychological	8.40 – 19.33	12.00	8.00 – 18.66	11.33	9.00 – 19.33	12.67	9.32	0.011
Social relationships	7.26 – 19.50	16.00	5.33 – 18.33	13.33	5.33 – 19.25	14.67	7.78	0.025
Environment	9.50 – 19.00	13.50	9.50 – 18.00	12.00	9.50 – 19.00	13.50	8.57	0.018

WHOQOL-Bref test is a shorter version of the original WHOQOL (World Health Organization Quality of Life) questionnaire; Min – Max - the values obtained from minimum to maximum; Me – median; H – Kruskal-Wallis Test

Taking into consideration the duration of infertility treatment, we observed statistically significant differences in the assessment of satisfaction with health ( $p = 0.023$ ), quality of life in the physical sphere ( $p = 0.020$ ), psychological sphere ( $p = 0.011$ ), social relationships ( $p = 0.025$ ), and the environment ( $p = 0.018$ ). Whereas, we found no such

differences in the assessment of overall quality of health ( $p = 0.101$ ). Women's sexual functioning at particular stages of sexual response as well as the relationship with a partner were evaluated using the FSQ-28 scale. The results of this evaluation, depending on participants' overall quality of life assessed using the WHOQOL-Bref test, are presented in Table 5.

**Table 5.** Researched sexual spheres and participants' general quality of life

Researched sexual spheres (FSQ-28)	Min -Max	Scores suggesting normal function	Me	General quality of life (WHOQOL-Bref test)	
				$r_s$	p-value
Desire	5-31	$\geq 23$	20.50	0.45	0.000
Arousal (sensation)	4-20	$\geq 14$	13.00	0.11	0.415
Lubrication	2-10	$\geq 8$	7.00	0.32	0.020
Emotional arousal	2-10	$\geq 8$	7.00	0.34	0.014
Orgasm	1-15	$\geq 12$	10.50	0.39	0.002
Pain	2-15	$\geq 12$	13.00	-0.16	0.230
Foreplay (pleasure)	6-30	$\geq 23$	22.00	0.38	0.003
Relationship with partner	2-10	$\geq 8$	7.50	-0.52	0.000

WHOQOL-Bref test is a shorter version of the original WHOQOL (World Health Organization Quality of Life) questionnaire; SFQ-28 = Female Sexual Function Questionnaire; Min – Max - the values obtained from minimum to maximum; Me – median;  $r_s$  Spearman's rank correlation coefficient

Regression analysis revealed the impact of quality of life on the occurrence of disorders at various stages of sexual response. There was a low positive correlation between better quality of life and

women's sexual activity in the desire, lubrication, emotional arousal, orgasm, and foreplay domains ( $p < 0.05$ ). However, we found a negative correlation

between quality of life and the relationship with a partner ( $R = -0.52$ ).

The results of the estimation (median) suggest that within this group of women disorders occurred at varying stages of the sexual response. They were the most prevalent in the case of desire, orgasm, and foreplay, where the resulting average point count within a group was smaller by over 3 points than the lowest score range limit describing normal sexual functioning. Assessment of sexual disorders associated with pain was the only one within the norm. Within the range of the other parameters of arousal (*sensation of arousal, lubrication, and emotional arousal*) as well as the relationship with one's partner, the participants of the study received on average between 1-2 points below the score range limit signifying the norm.

## DISCUSSION

There exists well-documented knowledge of the negative influence of PCOS on women's quality of life in the psychological, physical, and social spheres [6,8,9,10]. In our research, we found that general quality of life of the questionnaire participants was good, while general perception of health was worse. Taking into consideration the particular domains of life, the physical domain was assessed the highest by the participants, while the social and environmental domains were assessed slightly lower, and the psychological domain was assessed least favorably.

Multifaceted research, carried out amongst women in Southern Asia by Kumarapeli et al. proved a correlation between the type of PCOS, the degree of escalation of selected clinical symptoms, and the quality of their life. Moreover, the authors observed a significant effect of this syndrome on the general perception of health and on the psychological state of the research participants [10]. Similarly, in other research carried out using the SF-28 questionnaire, a significant decrease in the functioning of women in the physical, social, and emotional domains was observed [9].

The present study shows that among women with obesity the median of individual domains of quality of life, assessed on the basis of the WHOQOL-Bref, and was lower than in the group of respondents with normal weight and overweight.

According to some authors, the negative effect of inappropriate body mass on quality of life is especially visible amongst European women [5,11-14].

Turkish women between the ages of 15-49 with BMI above 25 had significantly lower results of quality of life (*assessed with HRQOL*) in every social domain, when compared with women with normal weight, except for the social domain [11, 14]. These observations were explained by the fact that the degree of excess of body mass correlated

positively with impairment of functioning in the physical and psychosocial sphere, and was associated with a greater number of subjective health ailments.

Sundararaman et al. wishing to assess the psychological state of women suffering from PCOS, carried out "The Scaled General Health Questionnaire-28" (GHQ28) test. On its basis, they stated that obesity and a broader waistline cause stress and deteriorate the psychological state of these women [15]. In the presented material, BMI had a greater effect on quality of life in the physical domain ( $p=0.001$ ), and a smaller, but significant, effect on the psychological domain ( $p=0.024$ ). It is worth highlighting that the majority of researchers from Asia did not find a significant correlation between an increased BMI in women suffering from PCOS and the perception of the quality of their lives [10].

Apart from obesity, hirsutism also has a negative impact on women's quality of life. Deeks et al. prove that women showing symptoms of hirsutism have a negative perception of their own bodies [16]. They are much more prone to developing depression and such negative emotions as frustration, fear, anger, shame, hopelessness, and loneliness [17].

Workshop Group ESHRE/ASRM concludes with the statement that there is proof confirming the more common occurrence of psychological disorders in women suffering from PCOS [1].

However, many researchers are doubtful whether psychological problems occur due to metabolic disorders or the symptoms of this syndrome (obesity, hirsutism, infertility) [1,18]. Some authors, researching the quality of life of women suffering from PCOS, present the negative effect of hirsutism on the perception of one's quality of life, especially in the psychological sphere [8,10,19,20]. Similar results have been achieved in our research.

According to Levental's Self-Regulation Model (SRM), the subjective way of perceiving one's illness exerts a strong influence on experiencing its course [21].

According to this concept, an individual creates cognitive and emotional images of the disease. The cognitive component of these schemes includes, among other things, convictions about the essence, the causes, the timing, the consequences, and the degree of possible control over the symptoms and affects the physical and psychological experience of this state. Hence, patients suffering from PCOS, treated for infertility, are under greater risk for developing psychological disorders, such as depression or anxiety, compared with healthy women [6].

In their research, Dahan et al. observed the occurrence of depression in infertile women twice as

often as in the control group as well as a much a higher level of its escalation. What is interesting, this referred to especially those women who were diagnosed with infertility 2-3 years prior, more than those under 1 year or 6 or even longer [22].

However, in our study, we found that the median for each domain of the WHOQOL-Bref in women undergoing infertility treatment from 4 to 6 years was lower than in women undergoing treatment for less than 4 years or over 6 years.

To sum up, it is important to highlight the fact that obesity, hirsutism, and infertility decrease the quality of life of women suffering from PCOS. This fact is proven not only by our research, but also that of other authors [8,19,20,23].

The sexuality of women suffering from PCOS should be considered from the perspective of somatic symptoms and the way they are subjectively perceived by the patients. These women are significantly less satisfied with their sexual lives compared with a group of healthy women. They consider themselves to be less attractive physically; this belief resulting from symptoms of hirsutism [6,8,19,23].

In the research of Mansson et al. 43% of women suffering from PCOS admitted that the disease exerts a negative influence on their sexual life. They assessed their sexual lives much lower and felt less attractive to their partners than women from the control group [24].

The present research was aimed at the evaluation of sexual disorders with the help of the FSQ-28 questionnaire. The respondents proved to have a slightly disordered sexual life with regard to desire, pleasure, arousal, and experiencing orgasm. No disorders were reported in the sphere of pain. In our study, regression analysis revealed a positive correlation between better quality of life and women's sexual activity in the desire, lubrication, emotional arousal, orgasm, and foreplay domains ( $p < 0.05$ ). This has confirmed the claims of other authors that a better quality of life has a positive impact on limiting the occurrence of sexual disorders [19,23].

Women suffering from PCOS constitute a distinctly specific group of patients who require specialist diagnostics and treatment, as well as multifaceted psychological and social support. Hence, apart from targeting the somatic sphere, it seems that the key factor in treatment is psychological work on the acceptance of functioning of one's body, emotions and motivation as well as self-validation and belief in one's worth.

## CONCLUSIONS

Clinical symptoms of PCOS such as obesity and hirsutism, affect women's quality of life. Another factor determining the quality of life of women with PCOS is the length of infertility

treatment. General quality of life affects the occurrence of disorders in women at particular stages of sexual response.

## Conflicts of interest

The authors have no conflicts of interest to disclose.

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