Int. J. Pharm. Investigation, 2025; 15(4):1298-1303.
https://www.jpionline.org

Original Article

Impact of Medication Adherence on Health-Related Quality of Life in Women with Polycystic Ovary Syndrome: A Cross-Sectional Study

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ABSTRACT

Background: Polycystic Ovary Syndrome (PCOS) is a common endocrine disorder in young women, marked by hormonal imbalances, insulin resistance, and elevated androgens. Each of these factors causes medical conditions such as obesity and dyslipidemia, and they have a negative effect on social relationships, mental and physical health, and HRQoL. **Materials and Methods:** This study was carried out at the Vivekananda General Hospital, Hubballi, Karnataka. Study included 83 female volunteers with PCOS diagnoses between the ages of 18 and 35. Age, marital status, and employment were demographic data gathered. The Medication Adherence Rating Scale (MARS) was used to assess medication adherence. **Results:** According to the results of the study, the average HRQOL score among single women with PCOS was 3.514±0.870, and there was no significance (p=0.524) between HRQOL and MARS scores. The mean HRQOL score of married individuals was marginally lower at 3.387±0.788, and there was no significance (p=0.180) between them. Psychological and emotional status and body image showed variation among respondents across HRQOL areas. The study emphasized how different sociodemographic variables and clinical traits impact the complicated nature of HRQOL in PCOS patients. **Conclusion:** although PCOS has a substantial negative influence on HRQOL, medication adherence does not seem to be a major factor in determining these results in this research population. To provide more individualized and efficient treatment plans, future studies should examine other variables affecting PCOS patients' HRQOL.

Keywords: Dyslipidemia, Health-Related Quality of Life (HRQOL), Medication Adherence, Polycystic Ovary Syndrome (PCOS).

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Received: 08-02-2025;
Revised: 12-04-2025;
Accepted: 30-06-2025.

INTRODUCTION

Polycystic Ovary Syndrome stands as a significant endocrine disorder among young women, impacting both their health-related quality of life and mental well-being. More importantly, this progresses into a chronic health issue that persists for far into advancing age and impacts on. According to reports, PCOS prevalence among teenagers in India varies with racial equivalents and is predicted to be 9.13% (Tabassum *et al.*, 2021). It is recognized as a heterogeneous illness with an uncertain aetiology that causes an elevated level of androgens, predominantly from the ovary, and it is linked with Insulin Resistance (IR) (Malik *et al.*, 2015). In PCOS Approximately fifty percent of women with are obese, 70% have dyslipidemia, and 80% are insulin resistant negatively impacting the quality of life in terms of health, these clinical characteristics raise the risk for cardiometabolic disorders and reproductive malignancies by 50% (Wright, Tavakoli, and Corbett, 2024). Though formerly believed to be a condition exclusive to adult women, PCOS is a lifelong syndrome. Although the exact etiology of this complicated illness is unknown, inherited and environmental factors are thought to be the primary culprits. The primary pathophysiological aspects of PCOS are hormonal imbalance, insulin resistance, persistent low-grade inflammation, and hyperandrogenism. These factors decrease folliculogenesis and raise the risk of associated comorbidities (Escobar-Morreale, 2018) (Teede, Deeks, and Moran, 2010).

HRQoL is a multifaceted concept extensively used in medical research and increasingly integrated into everyday medical

DOI: 10.5530/ijpi.20250333

care. It refers to how individuals perceive their own lives within their cultural and belief frameworks, considering their personal aspirations and worries. Assessment of HRQoL encompasses vital aspects such as physical health, emotional well-being, degree of independence, and social connections (Sánchez-Ferrer *et al.*, 2020).

In recent times, there has been a growing trend to include HRQoL evaluation in both clinical investigations and routine management of Polycystic Ovary Syndrome (PCOS). This has led to numerous global studies indicating links between HRQoL and PCOS presence, suggesting that women with PCOS might face challenges in maintaining a satisfactory HRQoL (Sánchez-Ferrer *et al.*, 2020).

Medication adherence is crucial in managing the symptoms and long-term health concerns of PCOS. Research studies have investigated medication adherence among women with PCOS.[7] Adherence to medication regimens is crucial for achieving optimal health outcomes in PCOS. Poor adherence can result in poor treatment of symptoms such as irregular periods, infertility, gaining weight, and an increased risk of developing chronic illnesses including DM and heart disease. Healthcare providers can improve the quality of life for individual patients by customizing treatment plans based on factors affecting medication adherence (Parker, Warren, Nair, and Barnard, 2020).

As there is small number of studies done with respect to medication adherence in PCOS women's, in this way the current study is embraced to assess the impact of medication adherence on health related quality of life.

MATERIALS AND METHODS

Study site

The research was carried out in outpatient wards of gynaecology department at Vivekananda General Hospital, Hubballi, Karnataka.

Study design

It was a cross-sectional study employing MARS scale, PCOSQoL-42 and PCOSQoL-47, to assess the impact of medication adherence on health-related quality of life in women's suffering with PCOS, a set of questions were provided to study participants and were instructed to fill the form (google form). After the completion of filling the form, participants were exposed to the pharmacist counselling which covered the all the information related to PCOS and medication adherence.

Study period

The study was conducted over a period of six months out in outpatient wards of gynaecology department at Vivekananda General Hospital, Hubballi, Karnataka. The study involved planning of one month, data collection and interpretation for three months and result analysis two months.

Study criteria

Inclusion criteria: Patients age ranging between 18-35 years of age and Patients diagnosed with PCOS/PCOD.

Exclusion criteria: Patients who are not willing to participate, Incomplete medical or medication information and Patients with comorbidities.

Study Procedure

Data collection forms, consent form, and also google forms were prepared. Appropriate questionnaire scales were selected and permission was sought from the author via email. To assess HRQoL, the PCOSQL scale was employed. It had two versions: PCOSQL-47 for married women and PCOSQL-42 for unmarried women. Subjects were chosen based on predefined criteria for inclusion and exclusion. Subjects were explained about the study objective, benefits and risks associated with the study and verbal/ written consent of the subjects are obtained. Patients' demographic details such as medical history, treatment chart, and prescribed drugs were collected and documented in a designed data collection form and Google forms. The collected data was evaluated for HRQOL. For the assessment of medication adherence, the MARS scale was used. All the data presented in Google form was available in a spreadsheet which was entered in an Excel sheet. Results were analyzed using suitable statistical tests in SPSS version 26.

Statistical Analysis

The information was carefully organized, grouped into categories, and processed using SPSS version 26.0 to prepare it for analysis.

HRQoL

Health-Related Quality of Life Questionnaires for Women with Polycystic Ovary Syndrome PCOSQoL-42 questionnaire for unmarried women with PCOS.

Health-Related Quality of Life Questionnaires for Women with Polycystic Ovary Syndrome PCOSQoL-47 questionnaire for married women with PCOS.

How to calculate the score

The response to each item is made using the five-point Likert scale: Never=5 or no effect on the HRQOL, Seldom= 4, Quite often= 3, Very often=2, Always=1 or the maximal effect on the HRQOL.

Women will record their responses to the variable items in different domains of the questionnaires according to the presumed effect on their HRQOL. Women are free to respond to or decline any item in any domain. The sum of the total points in each item per domain was evaluated. Then we divided the result

Table 1: Demographic details of study subjects.

Sl. No.	Categories	Sub categories	No. of subjects (%) *n*=83
1	Gender	Female	83 (100%)
2	Age	18-23 24-29 30-35	40 (48.19%) 22 (26.50%) 21 (25.30%)
3	Marital status	Married Unmarried	35 (42.1%) 48 (57.8%)
4	Social habits	Smoking Alcohol	6 (7.2%) 4 (4.8%)
6	Occupation	Student Employed Home maker Other	38 (45.8%) 11 (13.3%) 29 (34.9%) (6%)

Table 2: HRQOL score of individual domains of unmarried women.

HRQOL Domains	Mean±SD	Overall HRQOL (Mean±SD)
Psychological and emotional status domain (P).	3.28±0.96	3.514±.870
Menstrual disorders and fertility domain (M).	3.59±1.03	
Body image domain (B).	3.31±1.19	
Hair disorder and acne domain (H).	3.60±1.06	
Coping domain (C).	3.78±0.98	

by the number of items that had been scored (only) to get the final domain score as a (mean±standard deviation). The ultimate or final score per the questionnaire was gained from the sum of individual domain scores divided by the number of domains that had been evaluated. The interpretation of the domain score points, or the final questionnaire points, was done according to the following ranges. First interval values (from 1 to <3 points) represent marked effects on HRQOL. Second interval values (from 3 to <4 points) represent the marginal effect on HRQOL. Third interval values (from 4 to <5 points) represent the minimal effect on HRQOL. Fourth interval (5 points) represents no effect on HRQOL.

MARS

The Medication Adherence Rating Scale (MARS) is a tool designed to assess a patient's willingness and ability to consistently take their prescribed medication. The MARS questionnaire comprises 10 items. The scoring system is as follows: for items 1-6 and 9-10, a response of 'No' is indicative of adherence and is assigned a score of 1. Conversely, for items 7 and 8, a response of 'Yes' indicates adherence and is also given a score of 1. The total possible score ranges from 0 to 10. Patients with a total score of ≥6 are considered to exhibit good adherence, whereas those with a score of <6 are considered to have poor adherence

RESULTS

A total of 83 subjects participated in the study. Table 1 presents the baseline and demographic characteristics of the individuals. All participants (100%) were female. The mean age of the study population was 25.13±5.5 years.

Categorization of the study population is done on the bases of age, where the age is in the range of 18-35. Majority of the subjects falls under age group of 18-23 years i.e., 40 (48.19%), 22 (26.50%) falls under the age group of 24-29 years, whereas the least number of subjects falls under the age group of an 30-35 years i.e., 21 (25.30%),

The marital status of the subjects, out of 83 study subjects, majority of subjects were found to be unmarried i.e. 48 (57.8%) and others were found to be married i.e. 35 (42.2%).

During the analysis of the social habits of 83 subjects, 10 (12%) were found to be present with at least one social habit. Out of this, 6 (7.2%) were found to have the habit of smoking, whereas 4 (4.8%) were found to be alcoholic, and the remaining 73 (87.95%) were found to have no social habits.

We categorized the study subjects based on occupation, out of 83 study population, 38 (45.8%) were students, 11(13.3%) were employed, 29 (34.9%) were homemakers, and 5(6%) were other (Table 1).

Overall HRQOL of unmarried women

We analysed using descriptive statistics, mean and SD were extracted and depicted in Table 2. The results showed that women with PCOS have decreased HRQOL.

Analysed the overall HRQOL of subjects by categorizing them into respective Domains, which includes Psychological and

Table 3: Co-relation between scores of overall HRQoL and HRQoL Interdomains with MARS using ANOVA of unmarried women.

HRQOL with MARS	*p*-value	Overall HRQOL with MARS (*p*-value)
P with mars	0.376	0.524
M with mars	0.430	
B with mars	0.573	
H with mars	0.505	
C with mars	0.938	

Table 4: HRQOL score of individual domains of married women.

HRQoL Domains	Mean±SD	Overall HRQoL (Mean±SD)
Psychological and emotional status domain	2.89±1.09	3.387±.788
Fertility and sexual life domain	4.23±0.64	
Body image domain	3.20±0.93	
Hair disorder and acne domain	3.30±1.11	
Obesity and menstrual disorders	3.29±1.04	

Table 5: Co-relation between scores of Overall HRQoL and HRQoL Interdomains with MARS using ANOVA of married women.

HRQoL DOMAINS with MARS	*p*-value	Overall HRQOL with MARS (*p*-value)
P with MARS	0.470	0.180
F with MARS	0.082	
B with MARS	0.179	
H with MARS	0.207	
O with MARS	0.560	

emotional status domain (P), menstrual disorders and fertility domain (M), Body image domain (B), Hair disorder and Acne domain (H), Coping domain (C).

The data reveals that the overall HRQOL of 48 participants is represented by a mean score of 3.5149 and SD is 0.87075. Mean score falls under second interval which indicates that there is marginal effect on HRQOL.

The mean scores and SD for the HRQOL domains are as follows: (3.28±0.96) for psychological and emotional status, (3.59±1.03) for menstrual disorders and fertility, (3.31±1.19) for body image, (3.60±1.06) for hair disorders and acne, and (3.78±0.98) for coping. These findings indicate that Coping domain have the better quality of life, whereas the psychological and emotional state domains have the lowest (Table 2).

Table 3 interpreted that there is no significant difference between MARS and scores of HRQOL (interdomain) with the p-values of 0.366, 0.43, 0.573, 0.505, 0.938, and P, M, B, H, C domains respectively.

A *p* value of less than 0.05 is typically taken as statistically significant. Since none of these *p*-values drop below 0.05, this can be found that there is not a statistically significant association between HRQOL and MARS for each of the following variables: P, M, B, H, and C. This indicates that, given the available data, there is insufficient evidence to support a significant association between HRQOL and MARS for these variables.

The *p*-value of 0.524 for the association between HRQOL and MARS implies that there is no statistically significant relationship between HRQoL and the MARS measure, as the p-value is substantially greater than the commonly used threshold of 0.05 (Table 3).

Overall HRQOL of married women

We analysed using descriptive statistics, mean and SD were extracted in Table 4. The results showed that women with PCOS have decreased HRQoL.

Analysed the overall HRQoL of subjects by categorizing them into respective Domains, which include the Psychological and emotional status domain (P), fertility and sexual life domain (F), Body image domain (B), Hair disorder and Acne domain (H), obesity and menstrual disorders (O).

The data reveals that the overall HRQoL of 35 married participants is represented by a mean score of 3.3874 and SD is 0.7884. The mean score falls under the second interval which indicates that there is a marginal effect on HRQoL.

The HRQoL domain scores are as follows: psychological and emotional state (2.89±1.09), fertility and sexual life (4.23±0.64), body image (3.20±0.93), hair disorder and acne (3.30±1.11), and obesity and menstrual disorders (3.29±1.04). Higher values imply greater quality of life. These findings indicate that the reproductive and sexual life domains have the highest quality of life, whereas the psychological and emotional state domains have the lowest (Table 4).

Table 5 shows that there is no significant difference between MARS and HRQoL (interdomain) with the p-values of 0.47, 0.82, 0.179, 0.207, 0.560, and P, F, B, H, O domains respectively.

These *p*-values indicates that none of the correlations between the HRQoL domains and MARS are statistically significant as they are all above the common threshold of 0.05. The reproductive and sexual life domain falls closest to significance, with a p-value of 0.082, but it falls short of the threshold. Based on the available data, there is not sufficient proof to show a substantial connection between MARS and any of the HRQoL categories.

The *p*-value of 0.180 for the association between HRQOL and MARS implies that there is no statistically significant relationship

between HRQoL and the MARS measure, because the p-value is substantially greater than the common threshold of 0.05 (Table 5).

DISCUSSION

The study comprised 83 female participants, with an average age of 25.13 years. The majority of subjects (57.8%) were unmarried and worked in a variety of jobs, with students constituting the largest group (45.8%). A tiny fraction (12%) had social habits, such as smoking (7.2%) and alcohol (4.8%). We assessed the medication adherence of our study subjects using the MARS. It was found that there was low medication adherence in the subjects which was similarly revealed in the study conducted by Madison Parker *et al*., (2020).

The average HRQOL score for single women was 3.514, with a SD of 0.870. An ANOVA analysis found no significant association (p=0.524) between HRQOL and MARS. HRQOL varied among categories, with psychological/emotional status having the lowest mean (mean=3.28) indicates lesser the QOL and coping having the highest rating (mean=3.78) indicates the better the QOL.

The average HRQOL score of married women was 3.387, with a standard deviation of 0.788. Significant variation was seen in the HRQOL areas, with the domains of fertility and sexual life rating highest (mean=4.23) and psychological/emotional state scoring lowest (mean=2.89). There was no discernible relationship between HRQOL and MARS, just like with single women (p=0.180).

HRQOL and MARS Interdomain Analysis

No significant link was found between MARS and any of the domains (Psychological, Fertility, Body Image, Hair Disorders, and Obesity) (all p> 0.05). The domain related to fertility and sexual life had the lowest p-value (0.082), indicating a tendency towards significance, while falling short of the required level of statistical significance. The effect of PCOS on QoL: Unmarried and married women with PCOS experienced a decrease in quality of life, especially in areas related to mental well-being and body image. This is in accordance with prior study into the emotional and social consequences of PCOS.

Social behaviors and demographics, the research found that participants had low rates of smoking and alcohol use. Understanding these behaviors is important for providing comprehensive care and guidance to patients.

Statistical significance

The study did not find significant links between quality of life and Medication Adherence (measured by MARS) in various areas, suggesting that while PCOS affects quality of life, medication adherence may not directly impact it in this group.

Clinical implications

The results highlight the need for personalized interventions that address psychological support, body image issues, and fertility concerns in women with PCOS. Focusing on these areas could potentially enhance overall quality of life, even if there is no direct connection to medication adherence.

CONCLUSION

The present research explored the relationship between the MARS and the HRQOL of 83 female participants who had been diagnosed with PCOS. The findings showed that people with PCOS often have lower HRQOL, especially when it comes to psychological well-being, body image, and coping strategies. The study that involved statistics did not discover a substantial correlation between adhering to medication and health-related quality of life considering the fact that there was a noticeable difference in HRQOL ratings across several demographic and health-related characteristics. It indicates that variables other than medication compliance, such as the complex interactions between the psychological, social, and physical components of PCOS, have a major effect on HRQOL findings. The research highlights the intricate impact of PCOS on the quality of life and highlights the need for all-encompassing patient care strategies that include not just medical therapy but also lifestyle changes and psychological support. In order to improve the HRQOL results for PCOS patients, comprehensive treatment options should be informed by more research into these multifactorial factors.

ACKNOWLEDGEMENT

The authors express their gratitude to the KLE Academy of Higher Education and Research, Belagavi's vice-chancellor, registrar, and dean of pharmacy. We also acknowledge the patients, physicians, and hospital personnel of Vivekanand General Hospital, Hubballi, for their invaluable support. Their cooperation and will to cooperate were crucial to the successful completion of the study.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

PCOS: Polycystic Ovary Syndrome; **HRQoL:** Health related quality of life; **MARS:** Medication adherence rating scale; **DM:** Diabetes mellitus; **PCOSQL:** Polycystic Ovary Syndrome quality of life.

ETHICAL APPROVAL

The written informed consent was acquired from each participant after Information regarding the study was provided to the patients and their families. The KLE College of Pharmacy Ethical

Committee gave its approval to the study. (IEC reference number KLECOPH/IEC/2023-24/07).

AUTHORS' CONTRIBUTION

Each author had equal responsibility for the study's conception, literature review's execution, manuscript writing, and revision.

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Cite this article: Choudary OPB, Nadaf A, Bhandare PB, Swamy AHV, Nyamagoud SB, Abhishek BJ, *et al*. Impact of Medication Adherence on Health-Related Quality of Life in Women with Polycystic Ovary Syndrome: A Cross-Sectional Study. Int. J. Pharm. Investigation. 2025;15(4):1298-303.