

# Association of Urinary Incontinence, Perceived Stress, and Quality of Life in Women with Polycystic Ovary Syndrome

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## ABSTRACT

**Background:** Polycystic ovary syndrome (PCOS) is associated with reproductive, metabolic, and psychological disturbances that may predispose affected women to urinary incontinence (UI) and impaired quality of life (QOL). However, evidence regarding the relationship between UI, perceived stress, and QOL in women with PCOS remains limited.

**Objective:** To determine the association between urinary incontinence, perceived stress, and quality of life among women with polycystic ovary syndrome.

**Methods:** This cross-sectional analytical study included 176 women aged 18–30 years recruited through stratified random sampling at the University of Lahore. Ninety participants had PCOS diagnosed according to the Rotterdam criteria, while 86 served as controls. Urinary incontinence, perceived stress, and quality of life were assessed using the International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI SF), Perceived Stress Scale (PSS), and 12-Item Short Form Health Survey (SF-12), respectively. Data were analyzed using SPSS version 25. Pearson correlation and Chi-square tests were applied, with statistical significance set at  $p < 0.05$ .

**Results:** Urinary incontinence was reported by 67.6% of participants. Moderate perceived stress was observed in 44.3%, while 34.7% reported high stress. A significant positive correlation was found between perceived stress and urinary incontinence severity ( $r = 0.566$ ,  $p < 0.001$ ), whereas urinary incontinence demonstrated a significant negative correlation with quality of life ( $r = -0.378$ ,  $p < 0.001$ ).

**Conclusion:** Women with PCOS experiencing greater perceived stress had more severe urinary incontinence, which was associated with poorer quality of life. Comprehensive multidisciplinary management addressing both physical and psychological health may improve patient outcomes.

**Keywords:** Polycystic Ovary Syndrome, Pelvic Floor Disorders, Perceived Stress, Quality of Life, Urinary Incontinence, Women's Health.

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## Introduction

Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders affecting women of reproductive age, with an estimated global prevalence ranging from 5% to 10%. It is characterized by hyperandrogenism, ovulatory dysfunction, and polycystic ovarian morphology, and is associated with a broad spectrum of reproductive, metabolic, and psychological complications. In addition to menstrual irregularities and infertility, women with PCOS frequently experience obesity, insulin resistance, dyslipidemia, and chronic low-grade inflammation, all of which contribute to long-term health consequences and impaired overall well-being (1).

Although considerable attention has been directed toward the reproductive and metabolic manifestations of PCOS, less emphasis has been placed on its association with pelvic floor disorders, particularly urinary incontinence (UI). Urinary incontinence, defined as the involuntary leakage of urine, is traditionally considered more prevalent among older, multiparous, or postmenopausal women. However, emerging evidence suggests that women with PCOS may also be at an increased risk of developing UI because of obesity, hormonal imbalance, insulin resistance, chronic inflammation, and alterations in pelvic floor muscle function. These physiological disturbances may adversely affect bladder support and neuromuscular control, thereby increasing susceptibility to urinary symptoms even among younger women (2).

Psychological distress is another important yet frequently overlooked aspect of PCOS. Women living with PCOS commonly experience elevated levels of perceived stress due to concerns regarding infertility, menstrual irregularities, hirsutism, acne, obesity, and negative body image. These physical and emotional challenges often contribute to anxiety, depression, and chronic psychological stress, which may further aggravate urinary symptoms through neuroendocrine mechanisms involving increased cortisol secretion, autonomic nervous system dysregulation, and altered pelvic floor muscle activity. Consequently, stress and urinary incontinence may interact in a bidirectional manner, creating a cycle that adversely affects both physical and mental health (3,4).

Urinary incontinence has a profound impact on health-related quality of life by limiting social participation, reducing physical activity, impairing emotional well-being, and diminishing self-esteem. Women experiencing urinary leakage often report embarrassment, social isolation, decreased work productivity, and impaired interpersonal relationships. In women with PCOS, who already face considerable psychological and metabolic challenges, the coexistence of urinary incontinence may further compromise quality of life and overall health status. Previous studies have demonstrated that women with PCOS and urinary symptoms are more likely to experience anxiety, depression, and poorer quality-of-life

outcomes compared with those without urinary dysfunction (5,6).

Despite growing recognition of these clinical concerns, evidence examining the interrelationship between urinary incontinence, perceived stress, and quality of life among women with PCOS remains limited. Most previous investigations have focused primarily on reproductive or metabolic outcomes, with relatively few studies evaluating the combined physical and psychological burden associated with urinary symptoms in this population. Therefore, the present study was conducted to investigate the association between urinary incontinence, perceived stress, and quality of life among women with polycystic ovary syndrome. Understanding these relationships may facilitate early identification of affected individuals and support the development of comprehensive management strategies that address both the physical and psychological dimensions of PCOS, ultimately improving patient-centered outcomes (2–6).

## Material and Methods

This cross-sectional analytical study was conducted at the University of Lahore to investigate the association between urinary incontinence, perceived stress, and quality of life among women with polycystic ovary syndrome (PCOS). The study included 176 female participants aged between 18 and 30 years who were recruited using a stratified random sampling technique to ensure adequate representation of women diagnosed with PCOS and those without the condition. Among the enrolled participants, 90 women had a confirmed diagnosis of PCOS based on the Rotterdam diagnostic criteria, whereas 86 women without PCOS served as the comparison group (7).

Women aged 18–30 years who were willing to participate and provided written informed consent were considered eligible for inclusion. Participants diagnosed with PCOS according to the Rotterdam criteria were included in the study. Women with neurological disorders affecting bladder function, current pregnancy, recent childbirth, active urinary tract infection, previous pelvic surgery, diagnosed psychiatric disorders influencing stress perception, or any chronic medical condition known to interfere with urinary function or quality-of-life assessment were excluded to minimize potential confounding factors.

Data were collected using a structured, self-administered questionnaire comprising demographic information and three internationally validated assessment tools. Urinary incontinence was evaluated using the International Consultation on Incontinence Questionnaire–Urinary Incontinence Short Form (ICIQ–UI SF), which assesses the frequency, severity, and impact of urinary leakage on daily life. Perceived stress was assessed using the Perceived Stress Scale (PSS), a validated instrument

designed to measure the degree to which individuals perceive life situations as stressful during the preceding month. Health-related quality of life was evaluated using the 12-Item Short Form Health Survey (SF-12), which measures physical and mental health status across multiple domains. Participants completed the questionnaires in a quiet and comfortable environment under the supervision of the research team to ensure completeness and consistency of responses.

All study procedures were performed in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the Institutional Review Board/Ethics Committee of the University of Lahore before commencement of the study. Participation was entirely voluntary, and written informed consent was obtained from all participants before enrollment. Confidentiality and anonymity of participant information were strictly maintained throughout the study by assigning unique identification codes and restricting access to research data to the investigators only.

The collected data were entered, coded, and analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0 (IBM Corp., Armonk, NY, USA).

Descriptive statistics were used to summarize participant characteristics and study variables. Continuous variables were presented as mean  $\pm$  standard deviation, whereas categorical variables were expressed as frequencies and percentages. Associations between categorical variables were assessed using the Chi-square test. Pearson's correlation coefficient was applied to determine the relationships between urinary incontinence, perceived stress, and quality-of-life scores. A two-tailed p-value of less than 0.05 was considered statistically significant for all statistical analyses.

## Results

A total of 176 women aged 18–30 years participated in the study. Of these, 90 (51.1%) were diagnosed with polycystic ovary syndrome (PCOS) according to the Rotterdam criteria, while 86 (48.9%) served as the comparison group. Urinary incontinence (UI) was reported by 119 (67.6%) participants, whereas 57 (32.4%) reported no urinary symptoms. Moderate perceived stress was the most frequently observed stress category (44.3%), followed by high perceived stress (34.7%). Regarding health-related quality of life (QOL), 34.7% of participants reported excellent health status, while 22.7% had poor health.

**Table 1: Baseline characteristics of the study participants (n = 176)**

Variable	Category	n (%)
Age (years)	Range	18–30
PCOS diagnosis	Yes	90 (51.1)
	No	86 (48.9)
Perceived stress	Low	37 (21.0)
	Moderate	78 (44.3)
	High	61 (34.7)
Quality of life	Poor	40 (22.7)
	Fair	35 (19.9)
	Good	40 (22.7)
	Excellent	61 (34.7)
Urinary incontinence	None	57 (32.4)
	Mild	25 (14.2)
	Moderate	39 (22.2)
	Severe	27 (15.3)
	Very severe	28 (15.9)

Overall, urinary incontinence severity increased with increasing levels of perceived stress. Participants with high perceived stress predominantly experienced severe or very severe urinary incontinence, whereas participants with low stress generally reported either no urinary incontinence or only mild symptoms. Participants with

poorer quality of life demonstrated a greater frequency of moderate to very severe urinary incontinence, whereas those reporting excellent quality of life were more likely to have either no urinary incontinence or only mild symptoms.

**Table 2: Association between perceived stress and urinary incontinence (n = 176)**

Perceived Stress	None	Mild	Moderate	Severe	Very Severe	Total
Low	22	7	8	0	0	37
Moderate	35	8	18	9	8	78
High	0	10	13	18	20	61
Total	57	25	39	27	28	176

**Table 3: Association between quality of life and urinary incontinence (n = 176)**

Quality of Life	None	Mild	Moderate	Severe	Very Severe	Total
Poor	2	5	12	9	12	40
Fair	12	0	5	12	6	35
Good	15	8	14	0	3	40
Excellent	28	12	8	6	7	61
Total	57	25	39	27	28	176

Correlation analysis demonstrated a statistically significant moderate positive relationship between perceived stress and urinary incontinence severity ( $r = 0.566, p < 0.001$ ). In contrast, urinary incontinence severity showed a statistically significant moderate negative correlation with quality of life ( $r = -0.378, p < 0.001$ ). No statistically significant association was

observed between perceived stress and quality of life ( $p = 0.074$ ). Overall, the findings indicated that increasing perceived stress was associated with greater urinary incontinence severity, while worsening urinary incontinence was associated with reduced quality of life among women included in the study.

**Table 4: Correlation between perceived stress, urinary incontinence, and quality of life**

Variables	Perceived Stress	Quality of Life	Urinary Incontinence
Perceived Stress	1	0.135 ( $p = 0.074$ )	0.566 ( $p < 0.001$ )
Quality of Life	0.135 ( $p = 0.074$ )	1	-0.378 ( $p < 0.001$ )
Urinary Incontinence	0.566 ( $p < 0.001$ )	-0.378 ( $p < 0.001$ )	1

**Discussion**

The present study investigated the association between urinary incontinence (UI), perceived stress, and quality of life (QOL) among women with polycystic ovary syndrome (PCOS) and demonstrated that urinary incontinence was highly prevalent in the study population. Furthermore, a significant positive correlation was observed between perceived stress and urinary incontinence severity, whereas urinary incontinence showed a significant negative correlation with quality of life. These findings suggested that women with greater psychological stress experienced more severe urinary symptoms, which consequently impaired their overall health-related quality of life. The results emphasized that the burden of PCOS extended beyond reproductive and metabolic dysfunction and substantially affected urinary and psychological health.

The high prevalence of urinary incontinence observed in this study was consistent with previous reports indicating that women with PCOS were more susceptible to pelvic floor dysfunction because of obesity, insulin resistance, hormonal disturbances, and chronic inflammatory processes. Elevated androgen levels and increased body mass index have been proposed to alter pelvic floor muscle

integrity and increase intra-abdominal pressure, thereby predisposing affected women to stress and mixed urinary incontinence. Omar et al. reported a significantly higher prevalence of pelvic floor dysfunction among women with PCOS compared with healthy controls, supporting the findings of the present study (3). Similarly, Saei Ghare Naz et al. concluded that metabolic abnormalities and endocrine alterations associated with PCOS contributed to urinary dysfunction and impaired pelvic floor performance (2).

The present study also demonstrated a moderate positive correlation between perceived stress and urinary incontinence severity. Women reporting higher stress levels experienced more severe urinary symptoms, suggesting that psychological distress might contribute to bladder dysfunction through neuroendocrine and autonomic pathways. Chronic activation of the hypothalamic–pituitary–adrenal axis has been associated with increased cortisol secretion, autonomic imbalance, altered detrusor muscle activity, and changes in pelvic floor muscle coordination, all of which may exacerbate urinary symptoms. Similar observations were reported by Solskyy et al., who found significantly higher perceived stress and autonomic dysregulation among women with PCOS, indicating that psychological factors may

substantially influence symptom severity (7). Likewise, previous evidence suggested that chronic stress and anxiety contributed to worsening lower urinary tract symptoms and increased symptom-related distress among affected women (4).

Another important finding of this study was the inverse relationship between urinary incontinence severity and quality of life. Participants with severe urinary symptoms reported poorer health status, indicating that urinary incontinence negatively affected physical, emotional, and social well-being. Urinary leakage often limits daily activities, reduces participation in social and occupational settings, and contributes to embarrassment, anxiety, and diminished self-confidence (8). These findings were consistent with previous studies demonstrating that urinary incontinence significantly reduced health-related quality of life regardless of age. Santoro et al. reported that women with PCOS experienced considerable reductions in quality of life because of the combined effects of infertility, metabolic disturbances, and psychological distress, findings that may become even more pronounced in the presence of urinary symptoms (5). Similarly, Winder et al. demonstrated that urinary incontinence adversely affected physical functioning, emotional well-being, and social participation among women experiencing pelvic floor disorders (6).

Although no statistically significant correlation was identified between perceived stress and overall quality of life in the present study, participants with high stress levels generally demonstrated greater urinary symptom severity, which indirectly contributed to poorer health outcomes. This observation suggested that urinary incontinence may partially mediate the relationship between psychological stress and diminished quality of life in women with PCOS. Future longitudinal studies incorporating mediation analyses may further clarify these complex interrelationships and identify potential causal pathways.

The findings of this study highlighted the importance of adopting a multidisciplinary management approach for women with PCOS. Routine clinical assessment should extend beyond reproductive and metabolic abnormalities to include evaluation of urinary symptoms, psychological stress, and health-related quality of life. Early implementation of pelvic floor muscle training, structured weight management programs, lifestyle modification, behavioral therapy, stress reduction interventions, and psychological counseling may reduce symptom burden and improve overall patient outcomes. Previous investigations have demonstrated beneficial effects of pelvic floor rehabilitation, cognitive behavioral therapy, regular physical activity, and mindfulness-based interventions in reducing urinary symptoms and improving psychological well-being among women with pelvic floor dysfunction and PCOS (3,5,7).

The present study possessed several strengths. It simultaneously evaluated urinary incontinence, perceived stress, and quality of life using internationally validated assessment instruments, thereby providing a comprehensive evaluation of the physical and psychological burden associated with PCOS. The inclusion of both women diagnosed with PCOS and a comparison group enhanced the overall interpretability of the findings, while standardized data collection procedures improved the reliability of the reported outcomes.

However, several limitations should also be acknowledged. The cross-sectional design precluded the establishment of causal relationships between urinary incontinence, perceived stress, and quality of life. Data were obtained through self-administered questionnaires, making the findings susceptible to recall and reporting bias. The study was conducted at a single institution with a relatively young population, which may have limited the generalizability of the results to broader populations. In addition, potentially important clinical variables such as body mass index, parity, severity of PCOS, hormonal profiles, insulin resistance, medication use, and physical activity levels were not evaluated and may have influenced the observed associations.

Future research should include multicenter prospective studies with larger and more diverse populations to confirm these findings and establish temporal relationships between urinary symptoms, psychological stress, and quality of life in women with PCOS. Further studies should also investigate the effectiveness of multidisciplinary interventions incorporating pelvic floor rehabilitation, psychological support, weight reduction strategies, and lifestyle modification in improving both urinary and psychological outcomes within this patient population.

## Conclusion

The present study demonstrated a significant association between urinary incontinence, perceived stress, and quality of life among women with polycystic ovary syndrome. Higher perceived stress was associated with greater urinary incontinence severity, while increasing urinary symptoms were associated with poorer quality of life. These findings highlighted the need for comprehensive clinical care that incorporates routine screening for urinary dysfunction and psychological distress alongside standard PCOS management.

## Authors' Contributions

ICMJE authorship criteria	Detailed contributions	Authors
Substantial Contributions	Conception or Design of the work	1,2,3
	Data acquisition	2,3,4
	Data analysis or interpretation	1,3
Drafting or Reviewing	Draft the work	1
	Review critically	1,2,3,4
Final approval	Final approval of the version to be published.	1,2,3,4
	Agreement to be accountable for all aspects of the work.	1,2,3,4
Accountable		

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