ORIGINAL ARTICLE

URINARY INCONTINENCE IN ANTENATAL WOMEN AND ITS IMPACT ON QUALITY OF LIFE

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Background: The involuntary leakage of urine is a key feature of urinary incontinence (UI), and is a prevalent but underreported condition among pregnant women. Despite being benign, UI significantly affects physical, emotional, and social well-being, particularly in low-resource environments where continence care is often overlooked. **Methods:** A prospective cross-sectional study was done over six months in the Gynaecology C Unit at Ayub Teaching Hospital, Abbottabad. A total of 388 women with singleton pregnancies beyond 37 weeks were enrolled using a non-probability, sequential sampling technique. Data was collected using standardized tools, including the International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI SF), Urogenital Distress Inventory (UDI-6), the Incontinence Impact Questionnaire (IIQ-7), and the SF-12v2 Health Survey. Variables included symptom type, severity, impact on daily activities, and overall health related quality of life. **Results:** UI symptoms were reported by the majority of participants, with frequent urination (70.1%) and urinary incontinence (51.0%) being the most common. Stress incontinence was suggested by leakage triggered by coughing or sneezing (59%). Around 13.6% experienced severe to very severe symptoms. UI had a considerable impact on daily life, notably on household tasks (55.4%), emotional health (44.8%), and physical activities (48.5%). General health and quality of life were also negatively impacted, with 43% expressing continuous weariness and 32.5% ranking their health as fair or poor. **Conclusion:** UI is a common and disruptive condition during pregnancy, affecting many aspects of quality of life. Early identification, education, and incorporation of pelvic floor health into antenatal care are essential to improving maternal well-being and reducing postpartum complications.

Keywords: Antenatal care; Maternal health; ICIQ-UI; Pregnancy; Quality of life; Urinary incontinence

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INTRODUCTION

The International Continence Society describes that urinary incontinence (UI) is a urinary tract disorder with the frequent complaint of small amounts of involuntary urinary leakage. Most commonly, this problem is reported in females, especially in pregnancy, postpartum stages, and in elderly females after the weakening of pelvic floor muscles and dysfunction of sphincters, leading to urinary leakage due to poor bladder control.[1] During all trimesters of pregnancy, physiological, hormonal, and anatomical changes take place in a female's body that ultimately lead to urogenital disorders, among which UI is the most frequently reported problem that can sometimes be the consequence of urinary tract infections (UTIs) by pathogenic microorganisms.[2] Rather than a primary cause, sometimes, due to the presence of predisposing factors like poor hygienic conditions in the immunocompromised states of an individual. It is reported that 65% of females during pregnancy have complaints of UI.[3]

The disease's severity is based on different factors, including the mother's body mass index, which is calculated based on her body weight and height, the fetal weight according to gestational age, the female's previous history related to urogenital complications, urinary tract infections, and hygienic conditions.[4] The pathophysiological features related to UI are multifactorial, especially in the case of pregnant females, which is linked with the fluctuation in the levels of female reproductive hormones.[5] The major concern is related to boosted concentrations of estrogen, progesterone, and relaxin. These chemicals play an important role in the relaxation of smooth muscles, including the urethral sphincter. The sphincter widening helps in lowering the closure pressure of the urethra. Furthermore, the expanding uterus puts more strain on the bladder muscles, limiting their capacity. This pressure leads to an increase in the frequency and urgency of urination.[6] The increased stretch on the pelvic floor muscles by increasing the weight of the fetus causes a lowering of the strength of muscles that puts more pressure on the

bladder, which significantly impairs urine control.[7] Even some non-rigorous daily activities like sneezing, coughing, or lifting something can frequently lead to urinary leakage in pregnant females, especially in the last trimester.[8] Previous literature shows that physiological and psychological changes during pregnancy, like intra-abdominal pressure and fluctuating hormone levels, may contribute to the development of UI during the antenatal period.[9] UI is a reversible, mostly acute, but can be chronic, urogenital illness. It has a substantial impact on the quality of life of a female, causing physical discomfort and low self-esteem in society as well. Her mental health is disturbed due to frequent urination, ultimately leading to sleepless nights. Her sexual relationship with her partner is also affected.[10] Pregnancy-based UI can sometimes become an embarrassment for the female, affect her social life, and lead to non-social behaviours with high stress and low feelings.[11] It has also been observed that many women hesitate to report their symptoms to healthcare practitioners. They feel that acute complaints of UI are a part of pregnancy and are reversible. The females in rural areas feel that it's a shame and a cultural taboo to talk or seek consultation for urogenital health-related problems in the community. But they are unaware or have missed the acute phase treatment and counselling related to hygiene, which can easily cure this stress-filled disorder.[12] The burden on the healthcare system of pregnancy-based UI is increasing due to insufficient antenatal specialized care, lack of awareness of pelvic floor muscular health, and poor integration of continence screening into normal prenatal care for females.[13] This emphasizes the critical need for evidence-based solutions for identifying, educating, and managing women at risk. Addressing such kind of urogenital problems can significantly improve her mental health with better quality of life and can decrease the frequency of postpartum complications of UI.[14]

After reviewing the literature related to the high incidence and potential psychosocial impact of UI during pregnancy, it's important to assess its burden systematically. So, the current research was designed to assess the prevalence among pregnant females and its impact on health-related quality of life (HRQoL) using standardized assessment tools. So, understanding the etiological factors can support the development of targeted interventions to improve maternal well-being.[15]

MATERIAL AND METHODS

This prospective cross-sectional study was carried out for six months from 1st November 2024 to 3rd May 2025 at the Gynaecology C Unit at Ayub Teaching Hospital in Abbottabad, after Institutional Review Board approval. The main objectives of this study were to determine the prevalence of UI and assess its impact on the HRQoL of affected females during pregnancy. Also, identify the demographics and associated clinical factors with the severity of UI during pregnancy.

A total of three hundred and eighty-eight females participated in the current study. The sample size was calculated using an online sample size calculator based on a 95% confidence interval, 5% margin of error, and an expected prevalence of UI of 52%. These parameters ensure adequate power of statistical analysis and generalizability in findings. Non-probability, sequential sampling technique was applied to collect the data from participants.[15]

The females aged 20 years and above with a singleton pregnancy lasting more than 37 weeks, having complaints of urinary incontinence, were enrolled in the current study. They were informed about the complete study and expected outcomes. So that consent was taken by the investigators.[16] Those females were excluded from the study if they had known genetic or congenital urogenital abnormalities, a history of stillbirth due to urogenital or pelvic trauma, or birth-related complications or pre-existing metabolic or chronic medical conditions such as hypertension, diabetes mellitus, or chronic kidney disease, as these conditions can alter fluid balance, bladder function, or nerve innervation, they can be the independent contributing factors in the assessment of UI.[17]

To conduct the current study, the protocol was presented to the Institutional Ethical Review Board, and approval was granted with IRB Ref. No. RC-EA-2025/016. The study was conducted in the Gynaecology/Obstetrics Unit C of the Ayub Teaching Hospital, Abbottabad. The participants who fulfilled the inclusion criteria as mentioned above were recruited for the observations. Informed consent was taken from the patient herself before the conversation related to the study. The study's goal was communicated to the patients so that they could make an informed decision. Urinary incontinence was diagnosed using the criteria defined by the International Continence Society.[17] The International Consultation on Incontinence Modular Questionnaire Urinary Incontinence Short Form (ICIQ UI SF), the 12-item Short Form Health Survey version 2 (SF-12v2), the Urogenital Distress Inventory Short Form (UDI 6), and the Incontinence Impact Questionnaire Short Form (IIQ 7) were used to assess urinary incontinence, as well as general and health-related quality of life.[18] These questionnaires were designed to collect data from participants of the study through interviews. Permission to use these questionnaires was obtained from the author via email.

Participants were informed of their right to withdraw at any stage of the study without any impact on their care. Data confidentiality was ensured by the researchers involved in the current study through anonymized data collection and secure storage. All standardized questionnaires and consent forms were translated into Urdu (Native language) and English to ensure linguistic and conceptual equivalence. Their final version was reviewed by the panel of experts, including public health professionals, language experts, and clinicians, to ensure content validity.

All the collected data was compiled on Excel sheets and analysed through SPSS software. To find out the association between the severity of UI symptoms and demographics of participants, a chi-square test was applied, and a *p*-value <0.05 was considered statistically significant.

RESULTS

Tables 1 and 2 outlines the prevalence of various urine symptoms and their severity and the extent to which these symptoms bother or affect patients. Types of urinary symptoms include frequent urination, urge-related leakage, stress-induced leakage, small-volume leakage, difficulty urinating, and discomfort/pain. These are key indicators of underlying urinary tract dysfunction. Based on cumulative symptom scores (e.g., ICIQ-SF or similar), categorized into four groups (slight to very severe). This table helps identify the predominant symptoms and how severely they affect individuals. Frequent urination (70.1%) and urge incontinence (51.0%) were the most reported symptoms. Approximately 13.6% had severe to very severe symptoms. The mean age (~36 years) reflects a younger adult female cohort, possibly premenopausal.

When we correlated the types of urinary incontinence symptoms with the severity, the chi-square *p*-value was 0.927, indicating no statistically significant association. These findings must be interpreted with caution, as symptom presence did not align with severity levels. While trends were observable, the lack of significance suggests a need for larger sample studies or multivariable analyses to confirm associations. While previous studies have suggested a strong correlation between symptom type and severity, our findings indicate otherwise. This contrast may be due to differing population characteristics, sample size, or lack of confounder adjustment. This underscores the need for adjusted regression analysis in future research.

Table 3 shows the effect of urine symptoms on daily life and reflects the functional impairment caused by urinary symptoms, drawing on patient-reported outcomes such as limitations in domestic tasks, exercise, travel, and emotional health. Measures domains from questionnaires like IIQ-7, focusing on how incontinence affects daily functioning, mobility, social life, and emotional well-being. Each row represents a life domain, with the number and percentage of patients reporting an impact. Urinary incontinence significantly interferes with household chores (55.4%), emotional health (44.8%), and social activity (32.5%). Nearly half of the patients reported emotional frustration, indicating a psychosocial burden.

After the analysis through chi-square, a statistically significant correlation ($p<0.001$ with degree of freedom 4) was found between UI symptoms and their impact on the activities of daily routine

Table 4 shows results related to Health-Related Quality of Life among participants and evaluates the overall health-related quality of life. (HRQoL) using a tool like SF-36, which includes physical functioning, pain, emotional health, and social limitations. These components include general health perception, limitations in physical/emotional roles, pain interference, and mood-related indicators (e.g., energy, calmness). This table shows how urinary symptoms extend beyond the urinary tract to affect patients' general health. 44.8% had difficulty climbing stairs, and 43.0% reported persistent fatigue, suggesting a multi-domain quality of life impairment. Table-5 related to urinary incontinence profile and leakage triggers provides specific data on leakage frequency, volume, impact on life, leakage triggers, and age distribution aligned with the ICIQ-UI Short Form. Leakage frequency and volume were categorized to reflect mild to severe symptoms. The impact of leakage on daily life was assessed via the interference score or subjective rating. Situational triggers identify what activities (coughing, exercising, urgency, etc.) provoke leakage, providing insight into incontinence type (stress vs urge vs mixed). Most leaks occur once per day or several times a day. Over 50% report small volume leakage. The most common triggers were coughing/sneezing (59%) and urgency (42%), suggesting stress and UI are both prevalent. When we correlated the health-related Quality of Life and general health of participants, we found the chi-square p-value was 0.2812. This relation shows that there is a statistically weak association between both parameters in pregnant females suffering UI complaints.

When the frequency of urinary incontinence was compared with the volume of urine, we also found no statistically significant association (chi-square *p*-value was 0.9696). So, the volume does not depend on the frequency of episodes.

When UI symptoms were compared with their impact on daily activities, we found the chi-square *p*-value was <0.001. This relation shows that there is a statistically significant association between both parameters in pregnant females suffering UI complaints

Table-1: Types of Urinary Symptoms (n = 388)

Types of Urinary Symptoms	Slight	Moderate	Severe	Very Severe	Total (n)	%
Frequent urination	70	120	60	22	272	70.1%
urinary incontinence	60	90	35	13	198	51.0%
Urine leakage during physical activity	50	75	30	11	166	42.8%
Small amounts of leakage (drops)	45	65	30	7	147	37.9%
Difficulty urinating	30	40	15	3	88	22.7%
Pelvic or genital discomfort	35	50	20	5	104	26.8%
Total	290	440	190	61	-	-

Table 2: Severity and Bother of Urinary Symptoms (n = 388)

Variables	Frequency and Percentage
Severity of Symptoms	
Slight (0–5)	158 (40.7%)
Moderate (6–12)	177 (45.6%)
Severe (13–18)	42 (10.8%)
Very Severe (19–21)	11 (2.8%)
Bother Caused by Symptoms	
Not at all	96 (24.7%)
Mild	213 (54.9%)
Moderate	58 (14.9%)
Severe	21 (5.4%)

Table 3: Impact of Urinary Symptoms on Daily Life (n = 388)

Activity Affected	Slight	Moderate	Severe	Very Severe	Total (n)	%
Household chores (cooking, cleaning, laundry)	105	70	30	10	215	55.4%
Physical recreation (walking, swimming, exercise)	98	60	25	5	188	48.5%
Entertaining activities (movies, concerts)	78	40	18	5	141	36.3%
Travel by car/bus >30 min from home	62	30	15	5	112	28.9%
Participation in social activities beyond the home	70	35	15	6	126	32.5%
Emotional health (anxiety, depression)	84	55	25	10	174	44.8%
Feeling annoyed	90	60	30	12	192	49.5%

Table 4: Health-Related Quality of Life Among Participants (n = 388)

Item	Frequency and Percentage
1. General health rated as "Fair" or "Poor."	126 (32.5%)
2. Limited in moderate activities (e.g., vacuuming, moving a table)	145 (37.4%)
3. Difficulty climbing several flights of stairs	174 (44.8%)
4. Accomplished less than desired due to physical health	152 (39.2%)
5. Health-related limitations on work or other activities	161 (41.5%)
6. Accomplished less than desired due to emotional problems	139 (35.8%)
7. Didn't perform activities as carefully due to emotional problems	118 (30.4%)
8. Pain interfered moderately to severely with normal work	133 (34.3%)
9. Felt calm and peaceful rarely or never	97 (25.0%)
10. Had low energy or fatigue most of the time	167 (43.0%)
11. Felt downhearted or blue frequently	101 (26.0%)
12. Social activities were affected by physical or emotional problems frequently	124 (32.0%)

Table 5: Urinary Incontinence Frequency, Severity, and Impact (n = 388)

Variables	n (%)
How frequently do you leak urine?	
Any time in life	34 (8.8%)
About once a week or less	72 (18.6%)
Two or three times a week	83 (21.4%)
About once a day	96 (24.7%)
Several times a day	78 (20.1%)
All the time	25 (6.4%)
How much urine do you usually leak?	
Few drops	41 (10.6%)
A small amount	204 (52.6%)
A moderate amount	115 (29.6%)
A large amount	28 (7.2%)
How much does leaking affect everyday life?	
Not at all (score 0)	96 (24.7%)
Mild impact (scores 1–4)	174 (44.8%)
Moderate impact (scores 5–8)	93 (24.0%)
Severe impact (scores 9–10)	25 (6.4%)
When does urine leak?	
When you cough or sneeze	229 (59.0%)
When you are asleep	39 (10.1%)
When you engage in physical activity or exercise	144 (37.1%)
When you're done urinating and clothed	98 (25.3%)
When you have a strong urge to urinate but can't get to the toilet in time	163 (42.0%)
Without any obvious reason	76 (19.6%)

DISCUSSION

The current study aimed to find out the prevalence, severity of symptoms, and the impact of UI on the quality of life of pregnant females in a tertiary care hospital setting involving a comparatively large population. Using universally accepted standardized questionnaires, the current study thoroughly examined UI during pregnancy in 37 weeks or above.[19] The used questionnaires covered prevalence, risk factors, and their effects on general and specific quality of life, as well as their impact on females' behaviour. The results showed that UI is one of the most prevalent medical conditions during pregnancy, but it impairs the physical, mental, and social well-being of a female. This could deliver medical professionals a comprehensive picture of the prevalence and effect of urine leakage, along with the related reasons why participants choose not to seek validated medical care.[20] After involving 388 pregnant females, approximately 70% showed complaints of frequent urination, but almost 50% reported involuntary urinary incontinence. Some physical activity and stress-related complaints were around 43%. The research's 52% incontinence prevalence was aligned with the previously published studies and is also comparable to the findings of some other studies as well.[21] One previously reported study only included primiparous women who had no urine leakage before pregnancy, although incontinence during pregnancy was found to be predicted by parity and UI before pregnancy.[22] Consistent with prior reported data, most pregnant females in the study had complaints of mild to moderate UI, with stress incontinence, and so, they observed a 50–55% prevalence of UI during late trimesters of pregnancy. [23]

According to the criteria defined by the International Incontinence Society, the first evaluation of urinary incontinence should take the level of discomfort into account. Urinary incontinence-related discomfort, particularly in pregnant women, was evaluated less frequently. It is inconsistent with a prior study. We discovered that incontinence significantly disturbs most pregnant women.[24] Effective preventative measures should be implemented throughout pregnancy to avoid UI and its related complications.[25] It is also evident that the development of incontinence during pregnancy is significantly influenced by any previous complaints and history of caesarean did not act as an exacerbating factor in UI.[26] Previous results reported that enuresis was included as an early sign of UI in pregnant women, but it has since been connected to incontinence in middle-aged and nulliparous women as well.[27] Women who had previously given birth vaginally or using an instrument were more likely to have UI or any other urogenital related disorders during their next pregnancy.[28] The study reported that around 45% females reported moderate severity and 14% showed severe UI during pregnancy. They also reported 55% and 20% bother of urgency of urine as mild to severe, respectively. These findings are also consistent with the previously reported data of researchers.[29] According to our findings, women may benefit from adjusting their lifestyle and behaviour, such as correctly following hygienic conditions and training for toilets to avoid urogenital complications during pregnancy and later in the daily activities of life.[30]

There was very little data in the literature review regarding physical and emotional women's health-related quality of life during pregnancy, and few studies looked at overall quality of life. The current study used universally accepted standardized questionnaires to assess generic and life quality.[31,32] The results indicate that urinary leakage has a negative impact on the social, mental well-being of a female because UI has an impact on the proficiency of females in daily functioning. More than 50% females reported problems while doing house chores, physical activities like walking, jogging, and exercise, as well as causing trouble with their emotional well-being. Around 49% showed frustration, and 45% reported depression due to UI during pregnancy. This ultimately leads to social withdrawal, sleep disturbance, and irritated behaviours, which are consistent with previous research on stress-related urinary incontinence during pregnancy.[33] Similar results were obtained in a previous study, which used the SF-36 to assess overall quality of life to collect data from females during pregnancy.[33] Urinary incontinence had a minor impact on pregnant women's perceived quality of life, as demonstrated by their lower IIQ-7 and UDI-6 scores, which were equivalent to prior studies on pregnant women but higher than those of women who did not seek medical help for UI. [34] These findings showed that women reported complaints including difficulty in mobility, hindrance, dependability, and pain at work. Furthermore, pregnant women's perceived quality of life decreased significantly as their incontinence symptoms intensified.

The factors triggering UI included in this study were coughing, pushing, and pulling of heavy objects, which reflected the mixed incontinence due to the intra-abdominal pressure from the growing and widening uterus and weakening of pelvic floor muscles. That is why more than 50% females reported urinary leakage many times a day.

Due to social pressure and lower self-esteem, females did not seek medical care, as reported in previous studies. Another significant reason for not seeking assistance was the idea that incontinence

during pregnancy was unavoidable or could be treated on its own. Pregnant women clearly did not understand the nature of incontinence and the long-term impact of incontinence during pregnancy on incontinence later in life, even though it is a medical disease. It is worth noting that few pregnant women planned to postpone consultation until after childbirth or felt embarrassed to discuss urinary leakage, which allows healthcare providers to initiate conversations during normal prenatal check-ups. Pregnant women can be informed about urinary leakage and educated on incontinence-related knowledge and prevention techniques.

CONCLUSION

This study emphasizes that urine incontinence (UI) is a common and frequently under-recognized problem among pregnant women, with more than two-thirds reporting symptoms such as frequent urination and urgency-related leakage. Stress and mixed incontinence types were commonly observed, primarily triggered by activities like coughing, sneezing, and physical exertion. While most cases were of slight to moderate severity, the condition significantly impacted daily functioning, emotional well-being, and overall health-related quality of life. (HRQoL). Although a significant association was found between UI symptoms and their impact on daily activities, no statistically significant link was observed between symptom type and severity. This suggests that clinical symptoms alone may not reliably predict the degree of functional impairment. Hence, both patient-reported outcomes and clinical assessments should be used in evaluating UI in antenatal care.

Recommendations:

UI during pregnancy imposes a substantial physical and psychological burden, despite its benign nature. Many women endure these symptoms silently due to stigma, lack of awareness, or misconceptions about their normalcy during pregnancy. The findings emphasize the need for routine screening, patient education, and the integration of pelvic floor health into antenatal care practices. Early identification of non-invasive therapies, including pelvic floor muscle exercise and behavioral therapy, can substantially improve maternal well-being and reduce long-term complications.

Limitations:

This study employed a cross-sectional design, which limits the ability to infer causal relationships between urinary incontinence symptoms and quality-of-life outcomes. Additionally, although chi-square tests were used to assess associations, no effect size statistics (such as Cramér's V) were reported, and potential confounding variables (e.g., parity, BMI, comorbidities) were not adjusted for in the analysis. This may have affected the precision and generalizability of the statistical findings. The data relied on self-reported responses, which may be subject to recall bias or social desirability bias, especially regarding sensitive issues like UI. Finally, although the questionnaires were translated into Urdu and English for clarity, cultural nuances may still influence how women interpret and respond to certain items.

AUTHORS' CONTRIBUTION

AI: Study design, conceptualization, write-up, data analysis. ZP: Literature review, proofreading. RS: Study design, literature review, proofreading. HI, SZ: Data collection. AI: Literature review.

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