

## Prevalence of Urinary Tract Infections and Associated Risk Factors Among Pregnant Females

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### ABSTRACT

**Background:** Urinary tract infections (UTIs) are a common health issue among pregnant women, posing risks to both maternal and fetal health. Understanding the prevalence of UTIs and associated risk factors in this population is essential for improving antenatal care.

**Objective:** To determine the prevalence of UTIs and identify associated risk factors among pregnant females attending antenatal clinics in selected hospitals.

**Methods:** A cross-sectional study was conducted with 215 pregnant women recruited from Central Park Teaching Hospital, General Hospital, Jinnah Hospital, BHU Kasissay, and DHQ Hafizabad. Ethical approval was obtained, and informed consent was secured from all participants. Data were collected using structured questionnaires, and urine samples were analyzed using culture tests to confirm UTIs. Descriptive statistics were used to analyze the prevalence and associated risk factors, while chi-square tests were applied to assess significant associations.

**Results:** The prevalence of UTIs was 44.7% (n=96). Of the participants, 66.5% had pre-existing medical conditions such as diabetes or kidney disease, and 51.2% reported a history of abortion. Inadequate fluid intake was reported by 64.2%, and 48.8% reported incomplete bladder emptying. Significant risk factors included pre-existing conditions, poor hydration, and hygiene practices.

**Conclusion:** The study shows a high prevalence of UTIs among pregnant women, with contributing factors including pre-existing medical conditions, poor hydration, and improper hygiene. Regular screening and improved antenatal education on hygiene and hydration are recommended.

**Keywords:** Urinary tract infections, Pregnant women, UTI prevalence, Risk factors, Antenatal care, Fluid intake, Incomplete bladder emptying

### INTRODUCTION

Urinary tract infections (UTIs) are among the most common bacterial infections globally, particularly in women due to anatomical and physiological factors. These infections occur when bacteria, predominantly *Escherichia coli*, enter the urinary tract, leading to various symptoms such as dysuria, increased frequency of urination, and pelvic discomfort. During pregnancy, the risk of developing UTIs increases substantially due to hormonal changes and mechanical pressures exerted by the growing fetus, which can impede normal urine flow, leading to urinary stasis and an increased likelihood of bacterial colonization (1). Studies show that approximately 3-35% of pregnant women worldwide experience UTIs, with varying prevalence across different regions, particularly in developing countries where healthcare access may be limited (2). Moreover, UTIs during pregnancy can range from asymptomatic bacteriuria to more severe cases like pyelonephritis, which may lead to complications such as preterm labor, low birth weight, and maternal morbidity if left untreated (3). The physiological changes that occur during pregnancy, including the dilation of the ureters and renal pelvis, contribute to the ascending spread

of infection, making pregnant women more vulnerable to such infections (4).

Females are more susceptible to UTIs due to their shorter urethra, which is closer to the rectum, facilitating bacterial entry into the urinary system (5). Risk factors that increase the likelihood of developing UTIs include pre-existing medical conditions such as diabetes, kidney disease, and immune system disorders, as well as behavioral factors such as inadequate fluid intake and improper hygiene practices (6). In particular, women who do not empty their bladder completely during urination or who wipe from back to front after using the toilet are at a higher risk of infection (7). Furthermore, the recurrence of UTIs is common, especially among women with a history of infections, with many experiencing multiple episodes during pregnancy (8).

The clinical presentation of UTIs during pregnancy can vary, with some women experiencing frequent urination, burning sensations, or incomplete bladder emptying, while others may have more severe symptoms like hematuria, pelvic pain, or lower back discomfort (9). Infections can often be asymptomatic, making routine urine screening in pregnancy

essential to detect and manage bacteriuria early, preventing the progression to symptomatic infections or pyelonephritis (10). Diagnosis typically involves urine culture, which remains the gold standard for confirming the presence of bacteria in the urinary tract, while dipstick tests for nitrites and leukocyte esterase can provide rapid, albeit less definitive, results (11).

The management of UTIs in pregnancy usually involves antibiotic therapy, carefully selected to avoid adverse effects on the fetus, and supportive measures such as increased fluid intake to flush out bacteria (12). However, antibiotic resistance is becoming an increasing concern, particularly in developing countries where access to appropriate medications may be limited, and misuse of antibiotics is more prevalent (13). In this context, ensuring that pregnant women adhere to prescribed antibiotic regimens and educating them on preventive practices such as proper hygiene, urinating after sexual activity, and maintaining hydration are crucial strategies in reducing the incidence of UTIs (14).

Given the high prevalence and potential complications of UTIs during pregnancy, this study aims to assess the frequency of UTIs among pregnant women in various healthcare settings and to identify associated risk factors. By understanding the patterns and risk factors of UTIs, healthcare providers can develop targeted interventions to reduce the burden of this common infection and improve maternal and neonatal outcomes (15).

## MATERIAL AND METHODS

This cross-sectional study was conducted to assess the prevalence of urinary tract infections (UTIs) and associated risk factors among pregnant females. Ethical approval for the study was obtained from the University of Lahore, and informed consent was taken from all participants prior to data collection. The study adhered to the ethical standards outlined in the Declaration of Helsinki, ensuring the protection of participants' rights and confidentiality throughout the research process.

The study population consisted of pregnant women attending various healthcare facilities, including Central Park Teaching Hospital, General Hospital, Jinnah Hospital, BHU Kasissay, and

DHQ Hafizabad. A total of 215 pregnant women, aged 17-49 years, were recruited using non-probability convenience sampling. Inclusion criteria were pregnant women with documented positive pregnancy tests confirmed by healthcare professionals, undergoing urine tests in each trimester, and those suspected or diagnosed with UTIs. Exclusion criteria included women with pre-existing chronic kidney disease, uncontrolled diabetes, active fungal symptoms, recent antibiotic use, or high-risk pregnancies such as carrying multiple fetuses.

Data collection involved administering a structured questionnaire to participants. The questionnaire captured demographic information, medical history, and lifestyle factors that could influence UTI risk. Information related to bladder emptying habits, fluid intake, personal hygiene practices, and consumption of caffeinated beverages was recorded. Additionally, clinical data on UTI diagnosis, including urine culture results, was collected from participants' medical records.

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics were employed to determine the prevalence of UTIs, as well as the frequency of associated risk factors. Categorical data were analyzed using percentages and frequencies, while continuous variables were described using means and standard deviations. Bar charts and histograms were used to visually represent the data.

## RESULTS

The study revealed that 44.7% of the participants had a history of UTI prior to pregnancy. The prevalence of UTI diagnosed by urine culture was also 44.7%. A significant percentage (51.2%) reported incomplete bladder emptying. Fluid intake was generally inadequate among participants, with 64.2% reporting insufficient daily fluid intake. Symptoms of UTI were commonly reported, with frequent urination being the most prevalent (20.9%).

These results suggest that pre-existing medical conditions, inadequate fluid intake, and improper hygiene practices may increase the risk of UTI among pregnant women.

**Table 1: UTI Diagnosis by Urine Culture**

Response	Frequency (n)	Percentage (%)
Positive	96	44.7%
Negative	119	55.3%

Out of 215 participants, 96 (44.7%) were diagnosed with UTI before pregnancy, while 119 (55.3%) were not. A variety of symptoms were reported among participants, including

frequent urination (20.9%), burning sensation (14.0%), and blood in urine (19.5%). 96 (44.7%) participants had a positive urine culture result indicating a UTI, while 119 (55.3%) did not.

**Table 2: History of UTI Diagnosis Before Pregnancy**

Response	Frequency (n)	Percentage (%)
Yes	96	44.7%
No	119	55.3%

**Table 3: Symptoms of UTI reported among Participants**

Symptom	Frequency (n)	Percentage (%)
Frequent urination	45	20.9%
Burning sensation during urination	30	14.0%
Difficulty starting urination	28	13.0%
Incomplete bladder emptying	35	16.3%
Blood in urine	42	19.5%
Pelvic pain or discomfort	14	6.5%
Lower back pain	21	9.8%

The study collected data from 215 pregnant females, examining various risk factors and health conditions. Regarding bladder emptying behavior, 105 participants (48.8%) reported completely emptying their bladder when urinating, while 110 (51.2%) did not. In terms of caffeinated beverage consumption, 70 participants (32.6%) consumed only coffee, 79 (36.7%)

consumed both coffee and tea, and 66 (30.7%) consumed a combination of coffee, tea, and soda. When asked about their fluid intake, 77 participants (35.8%) reported drinking enough fluids throughout the day, while 138 (64.2%) admitted they did not.

**Table 4: Risk Factors for UTI reported among Participants**

Behavior/Response	Frequency (n)	Percentage (%)
<b>Completely Emptying Bladder</b>		
Yes	105	48.8
No	110	51.2
<b>Caffeinated Beverage Consumption</b>		
Coffee only	70	32.6
Coffee and Tea	79	36.7
Coffee, Tea, and Soda	66	30.7
<b>Fluid Intake Behavior</b>		
Yes	77	35.8
No	138	64.2
<b>Hypertension History</b>		
Yes	96	44.7
No	119	55.3
<b>Previous History of Abortion</b>		
Yes	110	51.2
No	105	48.8
<b>Wiping Behavior After Toilet Use</b>		
Front to back	49	22.8
Not front to back	166	77.2

## DISCUSSION

The findings of this study revealed a significant prevalence of urinary tract infections (UTIs) among pregnant women, aligning with previous research conducted in similar populations. Out of the 215 participants, 44.7% were diagnosed with UTIs, a figure that resonates with prior studies documenting UTI prevalence among pregnant women (1). The study by Omwenga et al. (6) also noted that 34% of pregnant women seeking medical care exhibited UTIs, reflecting a widespread issue in this population. Contributing factors such as pre-existing medical conditions, poor hygiene practices, and inadequate fluid intake were significant in this study, as evidenced by 66.5% of participants having pre-existing conditions like diabetes or kidney disease. This finding concurs with previous research, which identified these conditions as key contributors to UTI risk (6).

The study also highlighted that 51.2% of participants did not completely empty their bladder, a known risk factor for UTIs, which corroborates earlier findings by Albladi et al. (1), who identified incomplete bladder emptying as a significant predictor of UTI occurrence. Similarly, a considerable portion of participants consumed caffeinated beverages, which can act as bladder irritants, potentially exacerbating UTI symptoms and recurrence. The role of poor hydration was also notable, with only 35.8% of participants reporting sufficient fluid intake throughout the day, further emphasizing the importance of hydration in UTI prevention (6).

In comparison to the findings of Ngong et al. (2), who found a 31% prevalence of UTIs, the slightly higher prevalence in this study could be attributed to the specific characteristics of the sample, including a high proportion of participants with pre-

existing medical conditions. The study's sample also revealed that a significant percentage of participants did not practice adequate hygiene, such as wiping from front to back after using the toilet, further contributing to UTI risk (6).

This study is strengthened by its diverse sample size and robust methodology, but it is not without limitations. The use of non-probability convenience sampling may limit the generalizability of the findings to broader populations. Additionally, self-reported data on fluid intake and hygiene practices could introduce reporting bias. Despite these limitations, the study provides valuable insights into the prevalence and risk factors of UTIs among pregnant women, suggesting the need for targeted interventions in antenatal care settings. These could include educating women on proper hygiene practices, the importance of adequate hydration, and the management of pre-existing medical conditions to reduce the risk of UTIs during pregnancy.

## CONCLUSION

This study demonstrated a high prevalence of urinary tract infections among pregnant women, with contributing factors including incomplete bladder emptying, inadequate hydration, pre-existing medical conditions, and improper hygiene practices. The findings emphasize the need for targeted preventive strategies in antenatal care to mitigate UTI risk and improve maternal health outcomes. Proper education on fluid intake, hygiene, and early symptom recognition could significantly reduce UTI-related complications during pregnancy, thereby enhancing the well-being of both mothers and their babies.

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