



ARTICLE METADATA

Article History

Received:	26 July 2026
Revised:	23 August 2026
Accepted:	18 September 2026
Published:	03 October 2026

Corresponding Author

Sumayya

Associate Professor, Department of
Obstetrics and Gynecology, MTI
Nowshera Medical College (NMC),
Nowshera, KP – Pakistan.

Email: drsumayya04@gmail.com

Keywords: Urinary tract infection;
pregnancy; antenatal women;
asymptomatic bacteriuria; risk factors.

DOI: [10.64911/ahnc2q42](https://doi.org/10.64911/ahnc2q42)

Quick Response (QR) Code



Journal of Pak International Medical College (JPIMC)
Scan to access official journal content

Scan to read this article.
on our website

Open Access



Original Article

Prevalence of Urinary Tract Infections and their Associated Risk Factors in Antenatal Women Attending OPD

Mehwish Syed ¹, Sumayya ², Javeria Saleem ³, Saeeda Safi ⁴, Shah Nawaz ⁵

¹Assistant Professor, Department of Obstetrics and Gynecology, MTI Nowshera Medical College (NMC), Nowshera, KP – Pakistan.

²Associate Professor, Department of Obstetrics and Gynecology, MTI Nowshera Medical College (NMC), Nowshera, KP – Pakistan.

³Assistant Professor, Department of Obstetrics and Gynecology, MTI Nowshera Medical College (NMC), Nowshera, KP – Pakistan.

⁴Assistant Professor, Department of Obstetrics and Gynecology, MTI Nowshera Medical College (NMC), Nowshera, KP – Pakistan.

⁵Professor, Department of Biochemistry, MTI Nowshera Medical College (NMC), Nowshera, KP – Pakistan.

Abstract

Objective: To determine the prevalence of UTI and identify associated risk factors among antenatal women attending outpatient services.

Methodology: This Cross-sectional study was conducted in the Department of Obstetrics and Gynecology, Qazi Hussain Ahmad Medical Complex, Nowshera, Pakistan, from March 2025 to September 2025. We enrolled 220 pregnant women using non-probability consecutive sampling. We collected sociodemographic, obstetric, and clinical data through a structured questionnaire. We analyzed midstream urine samples using standard microbiological methods. We analyzed data using SPSS version 27. We performed chi-square and binary logistic regression analyses, with $p < 0.05$ considered statistically significant.

Results: The overall UTI prevalence was 31.8% ($n = 70$). Among infected women, 64.3% had symptomatic UTI and 28.6% had asymptomatic bacteriuria. Escherichia coli was the predominant pathogen (60.0%). Significant associations were observed with educational status ($p = 0.008$), rural residence ($p = 0.009$), low socioeconomic status ($p = 0.001$), multigravidity ($p = 0.015$), previous UTI history ($p < 0.001$), diabetes mellitus ($p = 0.002$), and anemia ($p = 0.009$). Logistic regression identified previous UTI and diabetes mellitus as independent risk factors.

Conclusion: UTI is highly prevalent during pregnancy and is associated with several sociodemographic and clinical factors. Routine antenatal screening and targeted preventive measures are essential to improve maternal and fetal outcomes.

How to Cite: Syed M, Sumayya, Saleem J, Safi S, Nawaz S. Prevalence of Urinary Tract Infections and their Associated Risk Factors in Antenatal Women Attending OPD: Original Article. *J Pak Int Med Coll.* 2026;3(3): 83-87.

Introduction

UTI is one of the most prevalent bacterial infections in pregnancy and comprises asymptomatic bacteriuria, acute cystitis, and pyelonephritis [1]. Hormonal and anatomic changes associated with pregnancy increase infection risk, including decreased ureteric peristalsis, urinary stasis, bladder hypotonia, and mechanical compression of the urinary tract from the enlarging uterus [2,3]. Other changes in urine composition can also support bacterial growth and multiplication, such as glycosuria [4]. Incidence of UTI during pregnancy depends on the population, socioeconomic factors, diagnostic criteria, antenatal screening, and availability of healthcare services [5]. Since untreated infection can lead to pyelonephritis and to other maternal complications, such as sepsis and renal impairment [6], asymptomatic bacteriuria is a significant issue. Perinatal morbidity, such as low birth weight, premature rupture of membranes, preterm birth, and stillbirth, has also been reported as complications of maternal UTI [7]. During pregnancy, *Escherichia coli* is the most common pathogen isolated in UTI, followed by *Klebsiella pneumoniae*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, and *Enterococcus* species [8]. Some of the risk factors previously identified are previous UTIs, multiparity, diabetes mellitus, anemia, poor personal hygiene, and low fluid intake, as well as socioeconomic disadvantage [9]. However, in Pakistan, scarce diagnostic services, self-medication and antimicrobial resistance, and a lack of locally relevant epidemiological data are important challenges in preventing and managing UTI during pregnancy [10]. Despite its clinical significance, limited data are available on UTI prevalence and determinants in locally relevant settings. Therefore, this study aimed to determine the prevalence of UTI and associated risk factors among antenatal women attended in the OPD. This study aims to provide evidence on the prevalence of UTI and associated risk factors among antenatal women at a particular institution. The study may contribute to identifying women at heightened risk of infection based on relevant demographic, obstetric, behavioral, and clinical parameters, and to targeted antenatal screening and early management. The results could also add to the scarce literature on UTI in pregnancy in the region and serve as baseline data for future multicentre research. The study will also contribute to better patient education, prevention measures, and the rational use of antibiotics during pregnancy.

Materials and Methods

This cross-sectional study was conducted at the Department of Obstetrics and Gynecology, Qazi Hussain Ahmad Medical Complex, Nowshera, Pakistan, from March 2025 to September 2025. The study population included pregnant women attending antenatal clinics during the study period. All pregnant women who attended OPD for antenatal care were considered eligible for the study, regardless of age or gestation period.

Sample Size

The sample size was calculated using the WHO-recommended formula for estimating a population proportion

$$n = \frac{Z^2 P(1 - P)}{d^2},$$

where n is the required sample size, Z is the standard normal variate at a 95% confidence level (1.96), P is the anticipated prevalence of UTI among pregnant women, and d is the margin of error (5%). The calculated sample size was 220. After adding 10% to account for possible non-response or incomplete data, the final sample size was 242.

Participants

We enrolled 220 pregnant women attending the antenatal outpatient department on a consecutive basis. Eligible participants were women of any gestational age who provided written informed consent and agreed to participate in the study.

Inclusion Criteria

The following participants were included in the study:

- Pregnant women of any gestational age attending antenatal OPD
- Women willing to participate in the study
- Women who provided written informed consent

Exclusion Criteria

The following participants were excluded from the study:

- Women currently receiving antibiotic therapy
- Women with known chronic renal disease or congenital urinary tract abnormalities
- Critically ill patients unable to provide information
- Women unwilling to participate

Data Collection Procedure

We used a structured, pre-validated questionnaire developed after a comprehensive literature review to collect data. The questionnaire covered sociodemographic characteristics, obstetric history, clinical symptoms, personal hygiene practices, previous history of UTI, fluid intake, sexual activity, and relevant medical conditions. The study team approached eligible participants during antenatal clinic visits and explained the study objectives and procedures. We obtained written informed consent before enrollment. Trained data collectors conducted face-to-face interviews to ensure complete and accurate information.

Statistical Analysis

The Statistical Package for Social Sciences (SPSS) version 27, developed by IBM Corporation, was used to code, enter, and analyze the data. Before analysis, we cleaned and validated the data for completeness and accuracy. We used descriptive statistics to describe participant characteristics. We presented categorical variables as frequencies and percentages, and continuous variables as mean $\pm$ SD. We computed the prevalence of UTI as the percentage of the total study population with a positive urine culture. We assessed the association between UTI status and categorical independent variables using the Chi-square test. We used Fisher's exact test when the assumptions of the Chi-square test were not met. We entered variables with a statistically significant association ($p \leq 0.05$) in the bivariate analysis into a binary logistic regression model to identify independent predictors of UTI. We reported results as adjusted odds ratios (AORs) with 95% confidence intervals (CIs). We considered p -values ≤ 0.05 statistically significant.

Results

The study included 220 antenatal women. The research profile showed a mean participant age of 27.84 ± 5.63 years, with ages ranging from 18 to 41 years. Grouping age into discrete brackets showed that most participants, 118 (53.6%), fell within the core age group of 20–30 years. This distribution was followed by 64 (29.1%) women in the advanced maternal age category (above 30 years) and 38 (17.3%) participants under 20 years. Occupationally and socio-economically, the baseline profile indicated vulnerable frameworks; a large majority of the cohort were housewives (81.8%) and lived in rural environments (57.3%). Education levels varied, with 72 (32.7%)

completing primary education, and 48 (21.8%) classified as completely illiterate. Low socioeconomic status represented the largest single cohort tier at 47.3%.

Figure 1: Distribution of participants by age category.



The figure shows the age distribution of the study participants. Of the 220 participants, 38 (17.3%) were aged <20 years, 118 (53.6%) were aged 20–30 years, and 64 (29.1%) were aged >30 years.

Table 1: Baseline Sociodemographic Profile of the Study (N = 220)

Variable	Category	Frequency (n)	Percentage (%)
Age Group	<20 years	38	17.3
	20–30 years	118	53.6
	>30 years	64	29.1
Educational Status	Illiterate	48	21.8
	Primary Education	72	32.7
	Secondary Education	66	30.0
	Higher Education	34	15.5
Residence	Urban	94	42.7
	Rural	126	57.3
Socioeconomic Status	Low	104	47.3
	Middle	82	37.3
	High	34	15.5
Occupation	Housewife	180	81.8
	Employed	40	18.2

Data are presented as frequency and percentage. The table summarizes the participants' age group, educational status, place of residence, socioeconomic status, and occupation.

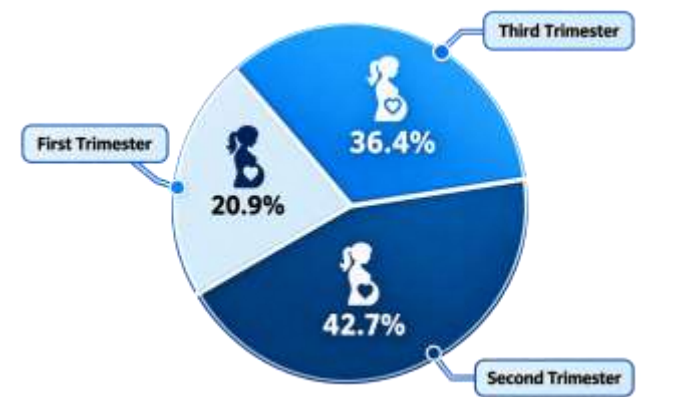
Table 2: Obstetric and Comorbidity Profile of Surveyed Antenatal Patients

Clinical Metric	Classification	Frequency (n)	Percentage (%)
Trimester Stage	First Trimester	46	20.9
	Second Trimester	94	42.7
	Third Trimester	80	36.4
Parity Status	Primigravida	85	38.6
	Multigravida	135	61.4
Previous History of UTI	Yes	74	33.6
	No	146	66.4
Diabetes Mellitus	Yes	31	14.1
	No	189	85.9

Anemia Status	Yes	69	31.4
	No	151	68.6

Data are presented as frequency and percentage. The table summarizes trimester of pregnancy, parity status, previous history of UTI, diabetes mellitus, and anemia among the study participants. N = 220. UTI, urinary tract infection.

Figure 2: Distribution of Participants According to Trimester of Pregnancy



The figure shows the distribution of participants according to trimester of pregnancy. Participants were distributed as follows: 20.9% in the first trimester, 42.7% in the second trimester, and 36.4% in the third trimester.

Table 3: Integrated Breakdown of UTI Prevalence, Clinical Presentation, and Microorganism Distribution

Variable	Category	Frequency, n (%)
UTI status	Positive	70 (31.8)
	Negative	150 (68.2)
Clinical presentation among UTI-positive women	Symptomatic UTI	45 (64.3)
	Asymptomatic bacteriuria	20 (28.6)
Predominant microorganism	Escherichia coli	42 (60.0)

Data are presented as frequency and percentage. UTI, urinary tract infection. Percentages for clinical presentation and microorganism distribution are calculated among women with UTI (n = 70).

Table 4: Bivariate Chi-Square Evaluations of Sociodemographic, Obstetric, and Clinical Drivers with UTI Status

Variable Block	Category Subtype	UTI Posn(%)	UTI Negn(%)	p-value
Educational Status	Illiterate	24 (50.0)	24 (50.0)	0.008*
	Primary Education	25 (34.7)	47 (65.3)	
	Secondary Education	15 (22.7)	51 (77.3)	
Residence Type	Higher Education	6 (17.6)	28 (82.4)	0.009*
	Urban	21 (22.3)	73 (77.7)	
	Rural	49 (38.9)	77 (61.1)	
Socioeconomic Status	Low	44 (42.3)	60 (57.7)	0.001*
	Middle	20 (24.4)	62 (75.6)	
	High	6 (17.6)	28 (82.4)	
Parity Standing	Primigravida	19 (22.4)	66 (77.6)	0.015*
	Multigravida	51 (37.8)	84 (62.2)	
Prior History of UTI	Yes	40 (54.1)	34 (45.9)	<0.001*

	No	30 (20.5)	116 (79.5)	
Diabetes Mellitus	Yes	18 (58.1)	13 (41.9)	0.002*
	No	52 (27.5)	137 (72.5)	
Anemia Profile	Yes	31 (44.9)	38 (55.1)	0.009*
	No	39 (25.8)	112 (74.2)	

Data are presented as frequency and percentage. We assessed associations between categorical variables and UTI status using the chi-square test or Fisher's exact test, as appropriate. A p-value ≤0.05 was considered statistically significant.

Table 5: Multivariate Logistic Regression Model Predicting Independent Antenatal UTI Risk

Independent Predictor Variable	Adjusted OR (AOR)	95% Confidence Interval (CI)	p-value
Previous History of UTI	3.84	2.01–7.31	<0.001*
Diabetes Mellitus	2.91	1.28–6.64	0.011*
Low Socioeconomic Status	2.47	1.29–4.73	0.006*
Anemia Profile	1.96	1.04–3.69	0.037*
Rural Residence	1.82	0.97–3.41	0.061
Multigravida Status	1.59	0.84–3.01	0.148

Data are presented as adjusted odds ratios (AORs) with 95% confidence intervals (CIs) and p-values. We included variables significantly associated with UTI in the bivariate analysis in the multivariate logistic regression model. We considered p-values ≤0.05 statistically significant. UTI, urinary tract infection; AOR, adjusted odds ratio; CI, confidence interval

Discussion

UTI remains an important cause of maternal morbidity during pregnancy, particularly in resource-limited settings. Pregnancy-related hormonal and anatomical changes, including ureteric dilatation, reduced peristalsis, urinary stasis, and vesicoureteral reflux, increase susceptibility to bacterial colonization and ascending infection [11,12]. The prevalence of UTI in the present study was 31.8%, meaning that one in three antenatal women had UTI. This finding highlights high infection levels among study participants and the need for routine antenatal assessment. The level of prevalence found in this study is similar to the high burden of UTI reported among pregnant women in developing countries. These differences between studies may reflect variations in population characteristics, screening and diagnostic approaches, and access to antenatal care [13,14]. A key feature is the infection's asymptomatic nature, as a woman can have many bacteria in her urine without symptoms [15]. Treatment of asymptomatic bacteriuria in pregnancy may decrease the risk of progression to symptomatic infection and pyelonephritis if it is detected early enough [16]. The present study showed that women aged 20-30 years made up the largest proportion of the study population, but no significant association was seen between age and UTI status. This finding suggests that susceptibility to UTIs may be more related to pregnancy-related physiological changes than chronological age. Previous studies have also shown that UTIs can happen at any reproductive age group, highlighting the need to undertake screening rather than just in a specific age group during pregnancy [17]. Educational status was significantly associated with UTI. Lower education

was associated with higher infection rates in women. Education can affect health literacy, hygiene knowledge, awareness of urinary symptoms, and timely use of antenatal services. Previous studies have also reported similar relationships between sociodemographic characteristics and maternal UTI [18]. UTI prevalence was also significantly higher in rural than in urban women and was significantly associated with rural dwelling. This may be due to poor access to health care facilities, diagnostic services, sanitation, and health education. The results underscore the need to improve antenatal screening and prevention services, especially for women who are not being served in these communities [19]. There was also a strong correlation between low socioeconomic status and UTI. These factors may be impacted by socioeconomic disadvantage, such as access to healthcare, nutrition, clean water, sanitation, and timely lab investigation. These can all make a woman more susceptible to infections during pregnancy [20]. Solving these socioeconomic problems may therefore be an important part in reducing the burden of maternal UTI. The incidence of UTI was much higher among multigravida women than among the primigravida women. Cumulative exposure to obstetric risk factors and changes in pelvic support and urinary retention may be associated with repeated pregnancies. Parity and obstetric history were also reported as possibly important factors in maternal urinary infection in previous studies [21]. One important finding was that previous UTI was highly associated with current infection. Women with a UTI history had significantly greater UTI prevalence, and prior UTI was the most consistent independent risk factor in the multivariate model (AOR 3.84, 95% CI 2.01–7.31; p<0.001). Recurrent infection may result from persistent or recurrent bacterial colonization, failure to eradicate bacteria, antimicrobial resistance, or susceptibility [22]. Further study and monitoring of pregnant women with a history of UTI is supported. In the present study, other statistically significant associations were those of diabetes mellitus and anemia. Diabetes may predispose a woman to urinary infection through changes in host defense and metabolic pathways. At the same time, anemia may be linked to nutritional and socioeconomic factors that affect a woman's susceptibility to urinary infection[22]. This study highlights the need to take into account common maternal comorbidities as a factor in the risk of developing UTI during antenatal care. This study has certain limitations. Its single-center, cross-sectional design limits causal inference. Selection bias may have arisen from the consecutive sampling method, and recall bias from self-reported information. The study also did not evaluate antimicrobial susceptibility or several potentially relevant confounders, including body mass index, detailed sexual practices, and catheterization history. Nevertheless, the study provides useful baseline evidence regarding the burden and associated factors of UTI among antenatal women in this setting.

Conclusion

UTI is a common condition among pregnant women and is significantly associated with low education level, rural residence, low socioeconomic status, multigravida, previous UTI, diabetes mellitus and anemia. The bacterium Escherichia coli (E. coli) was found to be the major pathogen. Regular antenatal screening, early diagnosis, and appropriate management of women at risk of UTI in pregnancy are critical to minimize maternal and fetal complications of UTI in pregnancy.

Conflicts of Interest: The authors declare no conflicts of interest.
Funding: The authors received no funds, grants, or other support for this study.

Disclaimer Statement: No part of the manuscript has been published or presented in any journal or conference. It is not under consideration in any other journal.

Ethical approval

Ethical approval was obtained from the Ethical Review Board of Nowshera Medical College, Nowshera (**Approval No. 16(i)/ERB/NMC; February 1, 2025**)

Authors' Contribution

Mehwish Sayed: Conceptualization, study design, data acquisition, data analysis and interpretation, manuscript drafting, critical revision, supervision, and final approval.

Sumayya: Data acquisition, data analysis and interpretation.

Javeria Saleem: Data analysis and interpretation.

Saeeda Safi: Data acquisition, data analysis and interpretation, critical revision, and supervision.

Shah Nawaz: Data acquisition, data analysis and interpretation, critical revision, and supervision.

All authors read and approved the final manuscript and agreed to be accountable for all aspects of the work.

Data Availability: The data generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

References

- Johnson CY, Rocheleau CM, Howley MM, Chiu SK, Arnold KE, Ailes EC. Characteristics of women with urinary tract infection in pregnancy. *J Womens Health (Larchmt)*. 2021;30(11):1556-64. doi: [10.1089/jwh.2020.8946](https://doi.org/10.1089/jwh.2020.8946)
- Getaneh T, Negesse A, Dessie G, Desta M, Tigabu A. Prevalence of urinary tract infection and its associated factors among pregnant women in Ethiopia: a systematic review and meta-analysis. *Biomed Res Int*. 2021;2021:6551526. doi: [10.1155/2021/6551526](https://doi.org/10.1155/2021/6551526)
- Yanaihara A, Ohashi K, Kaneko M. Association between urinary tract infection during pregnancy and adverse perinatal outcomes. *J Obstet Gynaecol Res*. 2021;47(6):2108-15.
- Gopalan U, Neelima N, Jayakumar K. Asymptomatic bacteriuria in South Indian pregnant women and treatment effect on outcome of pregnancy. *Indian J Obstet Gynecol Res*. 2021;8(3):314-22. doi: [10.18231/j.ijogr.2021.067](https://doi.org/10.18231/j.ijogr.2021.067)
- Salari N, Khoshbakht Y, Hemmati M, Khodayari Y, Khaleghi AA, Jafari F, et al. Global prevalence of urinary tract infection in pregnant mothers: a systematic review and meta-analysis. *Public Health*. 2023;224:58-65. doi: [10.1016/j.puhe.2023.08.016](https://doi.org/10.1016/j.puhe.2023.08.016)
- Ansaldi Y, Martinez de Tejada Weber B. Urinary tract infections in pregnancy. *Clin Microbiol Infect*. 2023;29(10):1249-53. doi: [10.1016/j.cmi.2022.08.015](https://doi.org/10.1016/j.cmi.2022.08.015)
- Committee on Clinical Consensus—Obstetrics. Urinary tract infections in pregnant individuals. *Obstet Gynecol*. 2023;142(2):435-45. doi: [10.1097/AOG.0000000000005269](https://doi.org/10.1097/AOG.0000000000005269)
- Khan HU, Afridi U, Hameed A, Shahjehan, Naeem S, Zaman A. Prevalence and risk factors of urinary tract infections in pregnant women: a cross-sectional study. *Pak J Med Health Sci*. 2023;17(7):87-90. doi: [10.53350/pjmhs202317787](https://doi.org/10.53350/pjmhs202317787)
- Khan S, Sumreen, Saleem F, Farooq M, Soomro AK, Shah AW. Urinary tract and gastrointestinal infections during pregnancy: prevalence, risk factors, and clinical implications in a Pakistani cohort. *Pak J Med Health Sci*. 2023;17(10):287-91. doi: [10.53350/pjmhs20231710287](https://doi.org/10.53350/pjmhs20231710287)
- Amin S, Anser R, Memon H, Faisal H, Tarique S, Rehan M, et al. Bacterial profile, antimicrobial susceptibility pattern and associated risk factors of urinary tract infection among pregnant women. *Pak J Med Health Sci*. 2023;17(9):201-5. doi: [10.53350/pjmhs20231709201](https://doi.org/10.53350/pjmhs20231709201)
- Yasmin H, Niaz WA, Sheik SZ, Hayat SS, Shaikh M. Prevalence of urinary tract infection with asymptomatic bacteriuria among gravid females: a Pakistani multicenter cross-sectional study. *Prof Med J*. 2024;31(1):1-7. doi: [10.29309/TPMJ/2024.31.01.7836](https://doi.org/10.29309/TPMJ/2024.31.01.7836)
- Taha AB. Bacteriological profile, antimicrobial susceptibility, and factors associated with urinary tract infection in pregnant women. *J Infect Dev Ctries*. 2024;18(3):391-8. doi: [10.3855/jidc.18239](https://doi.org/10.3855/jidc.18239)
- Patil G, Patil D, Patil A, Shrikhande S. Microbiological profile and antimicrobial susceptibility pattern of uropathogens isolated from pregnant women attending a tertiary care hospital in Central India. *Cureus*. 2024;16(10):e70798. doi: [10.7759/cureus.70798](https://doi.org/10.7759/cureus.70798)
- Knowledge, attitudes and practices of pregnant women regarding urinary tract infections living in peripheral areas of Pakistan: a questionnaire-based cross-sectional study. *Clin Epidemiol Glob Health*. 2024;28:101591. doi: [10.1016/j.cegh.2024.101591](https://doi.org/10.1016/j.cegh.2024.101591)
- Goyal A, Chauhan S. Maternal risk factors and microbiological profile of urinary tract infections in pregnancy: a cross-sectional study at a tertiary care center. *MGM J Med Sci*. 2025;12(2):313-21.
- Baimakhanova B, Sadanov A, Trenozhnikova L, Balgimbaeva A, Baimakhanova G, Orasymbet S, et al. Understanding the burden and management of urinary tract infections in women. *Diseases*. 2025;13(2):59. doi: [10.3390/diseases13020059](https://doi.org/10.3390/diseases13020059)
- Timm MR, Russell SK, Hultgren SJ. Urinary tract infections: pathogenesis, host susceptibility and emerging therapeutics. *Nat Rev Microbiol*. 2025;23(2):72-86. doi: [10.1038/s41579-024-01092-4](https://doi.org/10.1038/s41579-024-01092-4)
- Bakleezi A, Taybeh EO, Binodeh A, Alsharif AA, Alhamed M, Naser AY. Prevalence, risky behaviors, and antimicrobial resistance of urinary tract infections in pregnant women: a study in Jordan. *Medicine (Baltimore)*. 2025;104(17):e41986. doi: [10.1097/MD.00000000000041986](https://doi.org/10.1097/MD.00000000000041986)
- Nawaz S, Baber ZU, Dodani SK, Jamil S, Nasim A. Microbiology and risk factors for bacteremic urinary tract infection: insights from the largest urological center in Pakistan. *Int Urol Nephrol*. 2025;57(6):1699-706. doi: [10.1007/s11255-024-04357-2](https://doi.org/10.1007/s11255-024-04357-2)
- Liaqat H, Shah SHA, Khawaja TM, Khan NU, Shinwari KR, Khan SU. Prevalence, etiological microorganisms, and treatment susceptibility in urinary tract infections in pregnant women of Kohat, Khyber Pakhtunkhwa. *Int J Pathol*. 2025. doi: [10.59736/IJP.23.03.979](https://doi.org/10.59736/IJP.23.03.979)
- Incidence of urinary tract infections in pregnant females of District Peshawar: the role of age, gestational period, and locality. *Pak J Med Cardiological Rev*. 2025;4(2):362-78. doi: [10.64105/z1j0q873](https://doi.org/10.64105/z1j0q873)
- Committee/ACOG. Urinary tract infections in pregnant individuals. *Obstet Gynecol*. 2023;142(2):435-45. doi: [10.1097/AOG.0000000000005269](https://doi.org/10.1097/AOG.0000000000005269)