JOURNAL LA MEDIHEALTICO

VOL. 07, ISSUE 03 (654-662), 2026
DOI: 10.37899/journallamedihealtico.v7i3.3365

Risk Factors and Prevention Strategies for Recurrent Lower Urinary Tract Infections in Pregnant Women: A Literature Review

Mutiara Andjani Arsyad[1], Amelia Abdullah[2], Asrini Safitri[3], M. Hamsah[4], Abadi Aman[4]

[1]Students of the Medical Profession Study Program, Universitas Muslim Indonesia, Makassar, Indonesia,
[2]Departement of Obstetrics and Gynaekology, Faculty of Medicine, Hasanuddin University, Makassar, Indonesia.
[3]Department of Nutrition, Faculty of Medicine, Universitas Muslim Indonesia, Makassar, Indonesia
[4]Departement of Obstetrics and Gynaekology, Faculty of Medicine, Universitas Muslim Indonesia, Makassar, Indonesia.
[4]Departement of Obstetrics and Gynaekology, Faculty of Medicine, Universitas Muslim Indonesia, Makassar, Indonesia

**Corresponding Author: Mutiara Andjani Arsyad*
Email: mutiarandjani09@gmail.com

Article Info

Article history:
Received 10 June 2026
Received in revised form 25 June 2026
Accepted 11 July 2026

Keywords:
Urinary Tract Infection
Pregnancy
Risk Factors
Recurrence
UTI Prevention.

Abstract

Urinary tract infections (UTIs) in pregnant women are among the most common health problems and may lead to serious complications for both the mother and the fetus. Physiological changes during pregnancy increase the risk of infection as well as recurrence of UTIs. Therefore, a comprehensive understanding of risk factors and effective preventive strategies is essential. This study aims to analyze the risk factors and preventive measures for recurrent UTIs in pregnant women based on current literature. This study employed a narrative review approach by examining various scientific articles obtained from databases including PubMed, ScienceDirect, Google Scholar, Garuda, and Neliti. The literature search was conducted using keywords relevant to the research topic. Results of the research showed that the main risk factors for UTIs in pregnant women include hormonal and anatomical changes, a history of previous UTIs, poor personal hygiene, sexual activity, and medical conditions such as diabetes mellitus. In addition, asymptomatic bacteriuria plays an important role in increasing the risk of complications. Effective preventive measures include routine screening, culture-based treatment of urine samples, health education, and the implementation of clean and healthy lifestyle practices. The occurrence and recurrence of UTIs in pregnant women are multifactorial in nature, requiring a comprehensive management approach to reduce risks and improve maternal and fetal health outcomes.

Introduction

Urinary tract infections (UTIs) are one of the most common infectious diseases worldwide and constitute a significant public health problem, particularly among women (Medina & Castillo-Pino, 2019; Zeng et al., 2022; Nouh Ibrahim et al., 2025). Globally, UTIs account for millions of cases each year and are more common in women than men due to anatomical and physiological factors (Kalinderi et al., 2018). The World Health Organization also highlights that UTIs can occur in all age groups, but the risk is higher in pregnant women due to changes in the body's systems during pregnancy. This condition makes UTIs an important focus in maternal health services (Figueiredo & Padoveze, 2025; Vicar et al., 2023; Aisyah et al., 2026).

In pregnant women, the incidence of UTIs increases due to physiological changes such as ureteral dilation, increased urine volume, and decreased urinary tract muscle tone due to the influence of the hormone progesterone (Kashani et al., 2026; Karaca, 2026; Quick et al., 2026). These changes cause a slower urine flow and increase the risk of bacterial colonization (Chen et al., 2022). Furthermore, the enlarging uterus also puts pressure on the bladder, which can hinder optimal urinary emptying. This creates an ideal environment for the growth of pathogenic microorganisms that cause UTIs.

UTIs in pregnant women can manifest in various forms, ranging from asymptomatic bacteriuria to more severe infections such as cystitis and pyelonephritis (Chițu et al., 2026; Duff, 2026; Ansaldi & Tejada, 2023). Asymptomatic bacteriuria often goes undetected because it doesn't produce clinical symptoms, but it carries the risk of developing serious complications if left untreated (Wahyu et al., 2023). Therefore, routine screening through urine tests is crucial for early detection of infections and preventing the development of more severe disease.

Various studies have shown that numerous risk factors contribute to the occurrence and recurrence of UTIs in pregnant women. These factors include age, parity, education level, personal hygiene, and medical conditions such as diabetes mellitus (Fitrin & Adisasmita, 2024; Hidayah & Fatimah, 2023). Furthermore, behaviors such as holding in urine, insufficient fluid intake, and improper hygiene practices also increase the risk of infection. These factors are multifactorial and interrelated, necessitating a comprehensive management approach.

Recurrent UTIs are a serious problem because they can increase the risk of complications for both the mother and the fetus (Hasi et al., 2025; Awolaran et al., 2026; Airovna, 2026). Research shows that untreated UTIs can lead to premature delivery, low birth weight, and even neonatal infection (Cohen et al., 2019; Dahlquist et al., 2026; Singh et al., 2026). Furthermore, increasing antibiotic resistance also poses a challenge in the management of recurrent UTIs, making therapy less effective and potentially worsening the patient's condition (Agil et al., 2025). Therefore, appropriate, evidence-based prevention strategies are needed to reduce recurrence rates.

Based on this background, a literature review is essential to identify risk factors for recurrent UTIs in pregnant women and preventative strategies. Understanding the contributing factors and effective interventions is expected to improve promotive and preventive efforts in maternal healthcare. This study is also expected to inform clinical decision-making and develop more effective health policies for managing UTIs in pregnant women

Methods

This study employed a narrative literature review to identify and synthesize evidence regarding the risk factors, diagnostic approaches, interventions, and prevention strategies for recurrent urinary tract infections (UTIs) in pregnant women. A narrative review approach was selected because the included studies varied in research design, population, clinical focus, and outcome measurement, making statistical pooling inappropriate.

The literature search was conducted using PubMed, ScienceDirect, Google Scholar, Garuda, and Neliti. The search terms included combinations of “urinary tract infection,” “recurrent urinary tract infection,” “pregnancy,” “pregnant women,” “risk factors,” “asymptomatic bacteriuria,” “urine culture,” “antibiotic resistance,” and “UTI prevention.” Boolean operators such as “AND” and “OR” were applied where supported by the databases.

Studies were considered eligible when they: (1) discussed UTIs, recurrent UTIs, or asymptomatic bacteriuria in pregnant women; (2) examined risk factors, diagnostic procedures, treatment, clinical outcomes, or prevention strategies; (3) were published in English or Indonesian; (4) were available in full text; and (5) were published between 2018 and 2025. Studies involving women in general were included only when their findings provided relevant

evidence concerning recurrent UTI mechanisms, antibiotic resistance, prophylactic therapy, or non-antibiotic prevention that could support the discussion of UTI recurrence during pregnancy.

Studies were excluded when they were duplicates, unavailable in full text, unrelated to UTIs or pregnancy, provided insufficient methodological information, or did not contribute directly to the review objectives. Non-scientific articles, opinion pieces, and sources without identifiable publication information were also excluded.

The selection process was conducted in several stages. First, potentially relevant publications were identified through database searches. Second, duplicate records were removed. Third, titles and abstracts were screened according to the eligibility criteria. Finally, the full texts of potentially eligible studies were assessed. A total of 20 publications were initially included in the narrative synthesis.

Data were extracted using a structured matrix consisting of author and publication year, research topic or etiology, initial diagnostic approach, early intervention, clinical relevance, and publication type. The extracted findings were then grouped into five major themes: the general characteristics of UTIs during pregnancy, risk factors for recurrence, initial diagnostic strategies, antibiotic and non-antibiotic interventions, and clinical implications for maternal and fetal health.

Table 1. Inclusion and Exclusion Criteria

Inclusion	Exclusion
- International journals, national journals, citations from the Faculty of Medicine, UMI, clinical key, textbooks, and proceedings books discussing risk factors for recurrent lower urinary tract infections in pregnant women and prevention strategies. - Reference publication year within the period 2018-2026.	- Journals published over the last 10 years

Result and Discussion

The literature selection process identified 20 studies that were considered relevant to the review objectives. These studies included national and international journal articles, review papers, observational studies, cohort studies, a meta-analysis, and a community service publication. The selected studies examined various aspects of urinary tract infections in pregnant women and women with recurrent UTIs, including demographic, obstetric, behavioral, anatomical, microbiological, and medical risk factors. The studies also described diagnostic approaches, early interventions, preventive strategies, and their clinical relevance to primary, emergency, and intensive care services. A summary of the characteristics and main findings of the included studies is presented in Table 2.

Table 2. Characteristics and Main Findings of the Included Studies

No	Author (Year)	Topic/Etiology	Initial Diagnostics	Early Intervention	Clinical Relevance (ED/ICU)	Journal Types
1	Fitrin & Adisasmita (2024)	To examine the relationship between the number of pregnancies and gestational age on	Diagnosis is made through urinalysis (urine leukocytes) and clinical	Antibiotic therapy as indicated and pregnancy monitoring	Moderate - important for early detection in primary care	Jurnal Ners

		the risk of UTI in pregnant women, with a focus on maternal epidemiological factors.	genitourinary symptoms.			
2	Istikhomah (2024)	Risk factors for UTIs, such as age, occupation, and trimester of pregnancy, influence the incidence of UTIs.	Urinalysis examination and medical record data	Antibiotics and maternal health education	Moderate	Journal of Health Sciences
3	Dwidamayanti et al. (2024)	Literature review of risk factors for UTI includes education, occupation, and physiological changes of pregnancy.	PRISMA-based literature analysis	Evidence-based education and prevention	High – based on systematic review	UMI Journal
4	Hidayah & Fatimah (2023)	Behavioral factors such as holding in urine, obesity, and age affect the incidence of UTI in the third trimester.	Urinalysis and cohort recording	Behavioral education and antibiotic therapy	High – related to complications of childbirth	Scientific Journal of Health
5	Agil et al. (2025)	Patterns of bacteria causing UTI and antibiotic resistance in pregnant women	Urine culture and bacterial identification	Antibiotics according to sensitivity	High – important in ICU regarding resistance	Nasional
6	Rukmana et al. (2025)	Risk factors such as age, parity, vulvar hygiene, and hydration	Urinalysis and anamnesis	Hygiene education and antibiotic therapy	Moderate	Nasional
7	Nabilah et al. (2023)	Analysis of risk factors for UTI in pregnancy including socioeconomic and education	Literature study and urinalysis	Education and prevention	Moderate	Nasional
8	Delima (2017)	Demographic factors such as age, education, and parity on UTI	Survey dan pemeriksaan urin	Maternal health education	Low	Jurnal Nasional
9	Islamiati (2020)	Global prevalence of UTI in pregnant women and associated risk factors	Systematic analysis of database	Population-based prevention	Moderate	Systematic Review
10	Ashriady et al. (2022)	Health education in preventing UTI in pregnant women	Observation and education of cadres	Health promotion	Low	Journal of Community Service

11	Kalinderi et al. (2018)	Anatomical changes in pregnancy as a predisposing factor for UTI	Urine culture	Antibiotik guideline	Moderate	International Review
12	Chen et al. (2022)	Risk factors for recurrent UTI based on prospective studies	Urinalysis and culture	Specific antibiotics	Moderate	Internasional
13	Ahn et al. (2023)	ESBL Resistance in UTI	Follow-up urine culture	Broad-spectrum antibiotics	High	Internasional
14	Papp & Zimmern (2023)	The relationship between comorbidities (DM) and recurrent UTI	Metabolic screening	Glucose control + antibiotics	High	Review
15	Lazarus & Gupta (2024)	Management of recurrent UTI in women	Repeat urine culture	Antibiotic prophylaxis	High	Review Internasional
16	Corrales-Acosta et al. (2025)	Non-antibiotic prevention (probiotics, cranberries)	Clinical evaluation	Non-antibiotic interventions	Moderate	Review
17	Skuhala et al. (2025)	Effectiveness of long-term prophylactic antibiotics	Urine culture	Low-dose antibiotics	High	Observasional
18	Maharani et al. (2025)	Meta-analysis of UTI prevention	Statistical analysis	Alternative therapies	Moderate	Meta-analysis
19	Cohen et al. (2019)	Impact of UTI on neonates	Pregnancy screening	Early therapy	High	Kohort
20	Grobeisen-Duque et al. (2025)	Genital infections as a risk factor for recurrent UTIs	Infection screening	Combination therapy	Moderate	Internasional

Overview of Urinary Tract Infections in Pregnant Women

Urinary tract infections (UTIs) in pregnant women frequently occur due to physiological, hormonal, and anatomical changes during pregnancy. An analysis of 20 articles showed that increased progesterone levels cause ureteral muscle relaxation, slowing urine flow and increasing the risk of infection. Furthermore, the enlarging uterus also compresses the urinary tract, facilitating bacterial growth (Kalinderi et al., 2018).

Asymptomatic bacteriuria is also common in pregnant women without clinical symptoms, but carries a risk of developing more serious infections such as pyelonephritis. Research by Wahyu et al. (2023) emphasizes the importance of routine screening, as this condition often goes undetected without urine testing.

Risk Factors for UTI Recurrence in Pregnant Women

Based on the results of the synthesis of various articles, risk factors for recurrent UTI in pregnant women can be grouped into demographic, obstetric, behavioral, and medical factors. Demographic factors such as age, education level, and socioeconomic status influence the incidence of UTIs. Mothers with low education tend to have limited knowledge regarding hygiene, increasing the risk of infection (Fitrin & Adisasmita, 2024; Istikhomah, 2024).

Obstetric factors include gestational age and parity. Women in the third trimester are at higher risk due to uterine pressure on the bladder, while multigravidae are at higher risk of UTI recurrence (Hidayah & Fatimah, 2023). Behavioral and hygiene factors also play a significant

role, such as urinary retention, insufficient fluid intake, and poor personal hygiene, which facilitate the entry of bacteria into the urinary tract (Rukmana et al., 2025). Medical factors such as diabetes mellitus and genital infections can increase the risk of recurrence by promoting bacterial growth and spread (Papp & Zimmern, 2023; Grobeisen-Duque et al., 2025). Antibiotic resistance is also an important factor, where resistant bacteria cause treatment to be less effective so that infections recur more easily (Agil et al., 2025; Ahn et al., 2023).

Initial Diagnostic Strategy for UTI in Pregnant Women

UTI diagnosis in pregnant women is generally made through urinalysis and urine culture. Based on the articles analyzed, almost all studies emphasized the importance of urine testing as the primary method of early detection. Urinalysis is used to detect leukocytes, nitrites, and bacteria, while urine culture is used to identify the type of bacteria and antibiotic sensitivity (Chen et al., 2022).

Early detection is crucial, especially in cases of asymptomatic bacteriuria, as this condition often presents no clinical symptoms but can lead to serious complications. Therefore, routine screening of pregnant women is highly recommended, especially in the first trimester.

UTI Interventions and Prevention Strategies

Antibiotic Therapy

Most studies indicate that antibiotics remain the primary therapy for treating UTIs. Antibiotic use should be tailored to bacterial culture and sensitivity results to avoid resistance. Skuhala et al. (2025) stated that low-dose prophylactic antibiotic use can be effective in preventing recurrence in certain cases.

Non-Antibiotic Interventions

In addition to antibiotics, non-pharmacological approaches also play an important role. Corrales-Acosta et al. (2025) and Maharani et al. (2025) showed that the use of probiotics and cranberry extract can help prevent bacterial colonization in the urinary tract. This intervention is considered safer, especially for long-term use in pregnant women..

Health Education and Promotion

Health education is a key strategy in preventing UTIs. Ashriady et al. (2022) showed that education about genital hygiene, a healthy lifestyle, and the importance of fluid intake can reduce the incidence of UTIs. This education is most effective if provided continuously by healthcare professionals.

Lifestyle Modification

Lifestyle changes such as increasing water consumption, not holding in urine, and maintaining genital hygiene are simple but effective steps in preventing UTIs. This approach is especially important in primary healthcare settings.

Clinical Impact and Relevance to Health Services

UTIs in pregnant women have a significant impact on the health of both the mother and the fetus. Cohen et al. (2019) showed that UTIs can lead to complications such as preterm labor, low birth weight, and even neonatal infection. Therefore, UTI management is important not only at the primary care level, but also in the emergency department (ED) and intensive care unit (ICU). Untreated UTIs can progress to pyelonephritis and sepsis, which are serious conditions requiring intensive care. Therefore, early detection and appropriate treatment are crucial to prevent more serious complications.

Conclusion

Urinary tract infections in pregnant women are influenced by multiple interrelated factors, including physiological and anatomical changes during pregnancy, maternal age, parity, gestational age, personal hygiene, urinary habits, socioeconomic conditions, diabetes mellitus, genital infections, and a previous history of UTI. Antibiotic resistance, particularly infections caused by ESBL-producing bacteria, may also increase the likelihood of treatment failure and recurrence. Early detection through urinalysis and urine culture is therefore essential, especially for identifying asymptomatic bacteriuria and determining appropriate antibiotic sensitivity.

Prevention and management of recurrent UTIs during pregnancy require a comprehensive approach combining routine screening, culture-guided antibiotic therapy, maternal health education, adequate hydration, proper genital hygiene, and avoidance of urinary retention. Non-antibiotic interventions may provide additional preventive benefits, although their safety and effectiveness in pregnant women require further investigation. Strengthening early detection and evidence-based prevention at the primary healthcare level may reduce maternal complications, preterm birth, low birth weight, neonatal infection, and progression to severe conditions such as pyelonephritis or sepsis.

References

Ahn, S. T., Lee, H. S., Lee, D. H., Kim, J. W., Park, M. G., Park, H. S., ... & Oh, M. M. C. (2025). Association of substance use and vaginal infection with UTI in adolescent pregnant patients: A retrospective study. *BMC Pregnancy and Childbirth, 25*(1), 1189.

Airovna, A. A. (2026). RISK FACTORS FOR OBSTETRIC AND PERINATAL COMPLICATIONS IN FIRST PREGNANCY. *Egyptian Medical Journal of the National Research Center (Online)*, *4*(6), 370-374.

Aisyah, R. D., Prafitri, L. D., Faradisi, F., & Supriatinah, L. (2026). Determinants of Maternal Mortality: Analysis of Maternal Characteristics and Health Service Factors. *Jurnal Ilmiah Kesehatan Keperawatan*, *22*(1), 1-7.

Ansaldi, Y., & de Tejada Weber, B. M. (2023). Urinary tract infections in pregnancy. *Clinical microbiology and infection*, *29*(10), 1249-1253. https://doi.org/10.1016/j.cmi.2022.08.015

Awolaran, O., MacGregor, K., Lum, S. A., & Keijzer, R. (2026). Maternal Risk Factors Associated with Complex Gastroschisis: Cannabis Exposure and Recurrent Urinary Tract Infections May Be Modifiable Targets. *Journal of Pediatric Surgery*, 163000. https://doi.org/10.1016/j.jpedsurg.2026.163000

Chen, Y. S., Shei-Dei Yang, S., Yang, C. C., & Chang, S. J. (2022). Risk of urinary tract infection symptoms recurrence in women: A prospective observational study. *Tzu Chi Medical Journal, 34*(1), 69–74.

Chițu, M. C., Salmen, T., Răducanu, P. R., Pălimariu, C. M., Salmen, B. M., Stoian, A. P., ... & Mischianu, D. L. D. (2026). Clinical Characteristics, Microbiological Spectrum, Biomarkers, and Imaging Insights in Acute Pyelonephritis and Its Complicated Forms—A Systematic Review. *Medicina*, *62*(1), 222. https://doi.org/10.3390/medicina62010222

Cohen, R., Gutvirtz, G., Wainstock, T., & Sheiner, E. (2019). Maternal urinary tract infection during pregnancy and long-term infectious morbidity of the offspring. *Early Human Development, 136*, 54–59.

Corrales-Acosta, E., Cuartiella Zaragoza, E., Monzó Pérez, M., Benítez Perdomo, S., Corrales-

Riveros, J. G., & Corrales, M. (2025). Prevention of recurrent urinary tract infection in women: An update. *Microbiology Research, 16*(3), 66.

Dahlquist, K., Stuart, A., & Källén, K. (2026). Urinary tract infection during pregnancy and time relation to preterm birth—a Swedish observational study. *Acta Obstetricia et Gynecologica Scandinavica*, *105*(4), 672-678. https://doi.org/10.1111/aogs.70156

Delima, A. A. A. (2017). Korelasi faktor demografi dengan kejadian infeksi saluran kemih pada ibu hamil. *Alami Journal (Alauddin Islamic Medical) Journal, 1*(1), 18–28.

Duff, P. (2026). Infection after cesarean delivery: diagnosis, pathophysiology, management, and prevention. *American Journal of Obstetrics and Gynecology*, *233*(6), S464-S482. https://doi.org/10.1016/j.ajog.2025.08.007

Dwidamayanti, V., Ananda, F., & Lauwrenz, H. (2024). Karakteristik penyakit ISK pada ibu hamil literature review. *Innovative: Journal of Social Science Research, 4*(5), 9175–9189.

Figueiredo, J. L. D., & Padoveze, M. C. (2025). Nursing care in primary health care to tackle antimicrobial resistance in pregnant women with urinary tract infections. *Revista da Escola de Enfermagem da USP*, *59*, e20250001.

Fitrin, H., & Adisasmita, A. C. (2024). Jumlah dan umur kehamilan sebagai faktor resiko infeksi saluran kemih pada ibu hamil. *Jurnal Ners, 8*(2), 1258–1262.

Grobeisen-Duque, O., Mora-Vargas, C. D., Villavicencio-Carrisoza, O., Flores-Villanueva, J., Martinez-Salazar, M. G., Flores-Herrera, H., ... & Helguera-Repetto, A.

Hasi, H. H., Arefin, M. S. U. Z., Rashid, H. U., & Naher, S. (2025). Recurrent Urinary Tract Infection in Pregnancy Clinical Presentation and Feto-Maternal Outcome. *Community Based Medical Journal*, *14*(1), 101-107.

Hidayah, S. N., & Fatimah, O. Z. S. (2023). Faktor-faktor yang berhubungan dengan infeksi saluran kemih (ISK) pada ibu hamil trimester III. *Jurnal Ilmiah Kesehatan, 15*(1), 137–144.

Islamiati, D. (2020). *Prevalensi ISK ibu hamil*. UNUSA Repository.

Kalinderi, K., Delkos, D., Kalinderis, M., Athanasiadis, A., & Kalogiannidis, I. (2018). Urinary tract infection during pregnancy: Current concepts on a common multifaceted problem. *Journal of Obstetrics and Gynaecology, 38*(4), 448–453.

Karaca, S. Y. (2026). Beyond Expectations: The Astonishing Physiology of Motherhood. In *Managing Maternal Chronic Diseases for a Healthy Pregnancy* (pp. 1-21). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-032-15221-3_1

Kashani, K. B., Wium, L., Ostermann, M., Mehta, R. L., Ronco, C., Nelson-Piercy, C., ... & Sahay, M. (2026). Pathophysiology of pregnancy-associated acute kidney injury. *Nephrology Dialysis Transplantation*, gfag142. https://doi.org/10.1093/ndt/gfag142

Lazarus, J. E., & Gupta, K. (2024). Recurrent UTI in women–risk factors and management. *Infectious Disease Clinics, 38*(2), 325–341.

Maharani, R., Ratmandhika, S. R., Pradipta Pahu, Y. G., Wijaya, J. A., Anggarkusuma. (2023). What are the risk factors for recurrent UTI with repeated ESBL-producing Enterobacteriaceae? A retrospective cohort study. *Journal of Infection and Chemotherapy, 29*(1), 72–77.

Medina, M., & Castillo-Pino, E. (2019). An introduction to the epidemiology and burden of urinary tract infections. *Therapeutic advances in urology*, *11*, 1756287219832172.

https://doi.org/10.1177/1756287219832172

Nabilah, A. A., Dewi, A. S., Hasan, H., Said, M. F. M., & Muhammadong, M. (2024). Analysis of factors influencing the incident of urinary tract infections in pregnancy. *Jurnal EduHealth, 15*(03), 201–206.

Nouh Ibrahim, H., Salah Abd Elgawad, M., Saad Mahmoud Shoukhbs, N., Saeed Mohammed Abd Elaziz, M., & Saad Ali Abu Elbaka, S. (2025). Knowledge and practices of female nursing students regarding the preventive measures of vaginal and urinary tract infections. *Egyptian Journal of Health Care*, *16*(2), 846-864.

Papp, S. B., & Zimmern, P. E. (2023). Recurrent urinary tract infections and type 2 diabetes mellitus: A systematic review predominantly in women. *Frontiers in Urology, 3*, 1275334.

Quick, A., Garda, A., Rivera, A., Silva, S. R., Rishi, A., Joyner, M., ... & Kahn, J. M. (2026). American Brachytherapy Society Working Group Report on cancer surveillance, sexual health, and pelvic toxicity management in gynecologic malignancies. *Brachytherapy*. https://doi.org/10.1016/j.brachy.2026.03.010

Rukmana, K. A., Agusaputra, H., & Setiawan, B. (2025, January). Prevalensi dan faktor-faktor risiko infeksi saluran kemih pada ibu hamil di Puskesmas Dukuh Kupang Surabaya. In *Prosiding Seminar Nasional COSMIC Kedokteran* (Vol. 3, pp. 15–26).

Singh, D., Chanalia, P., Kumar, P., & Dhanda, S. (2026). Role of Probiotics in Preventing Preterm Births: Evaluating Effects on Premature Infants and Pregnant Women. *International Journal of Technology, Health and Sustainability*, *2*(01), 351-365.

Skuhala, T., Rimac, M., Trkulja, V., & Zidovec-Lepej, S. (2025). Antimicrobial prophylaxis for recurrent urinary tract infections in premenopausal and postmenopausal women: A retrospective observational study from an outpatient clinic in a tertiary university hospital. *Antibiotics, 14*(10), 998.

Skuhala, T., Rimac, M., Trkulja, V., & Zidovec-Lepej, S. (2025). Antimicrobial prophylaxis for recurrent urinary tract infections in premenopausal and postmenopausal women: A retrospective observational study from an outpatient clinic in a tertiary university hospital. *Antibiotics, 14*(10), 998.\

Vicar, E. K., Acquah, S. E., Wallana, W., Kuugbee, E. D., Osbutey, E. K., Aidoo, A., ... & Mensah, G. I. (2023). Urinary tract infection and associated factors among pregnant women receiving antenatal care at a primary health care facility in the northern region of Ghana. *International journal of microbiology*, *2023*(1), 3727265.

Zeng, Z., Zhan, J., Zhang, K., Chen, H., & Cheng, S. (2022). Global, regional, and national burden of urinary tract infections from 1990 to 2019: an analysis of the global burden of disease study 2019. *World Journal of Urology*, *40*(3), 755-763. https://doi.org/10.1007/s00345-021-03913-0