

**The Prevalence of Urinary Tract Infections: Literature Review**

Emily Melecosky

Lakeview College of Nursing

Dr. Ariel Wright

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## **The Prevalence of Urinary Tract Infections: Literature Review**

Urinary tract infections, also known as UTIs, are a significant concern affecting many people nationwide. Healthcare continually tries to find better interventions to decrease the number of people affected by these infections. Healthcare workers need up-to-date and reliable information to base their research efforts on finding the best methods. Literature reviews within quantitative research help to verify the validity of already attempted approaches to scientific research, which helps to advance further research, allowing healthcare workers to provide better care for patients. By recognizing and calculating variables in a dependable and logical method, quantitative studies and literature reviews allow researchers to evaluate the efficiency of interventions, determine the correlation between different factors in the research, or identify a progressive change that may occur during the study (Houser, 2023). Researchers can learn current methods using a quantitative literature review article discussing UTIs published within the last five years for these infections and find a way to decrease the numbers.

### **Risk factors for hospital-acquired non–catheter-associated urinary tract infection**

This study demonstrates the possibility of a relationship between deaths and hospital-acquired UTIs not associated with catheter insertion. The authors analyzed risk factors, such as age, gender, antibiotic administration within 24 hours of initial symptoms, and comorbidities associated with non-catheter-associated urinary tract infections, also known as non-CAUTIs. The authors' goal is to decrease the number of deaths, prolonged hospital stays, and further complications associated with these infections while establishing what risk factors play a role in higher percentages of UTIs (Aloush et al., 2019). These authors believe there is a correlation

between the signs and symptoms of UTIs during hospital stays and increased deaths due to these infections.

### **Key Points**

In this study, Aloush et al. (2019) used convenience sampling with a case-controlled design to gain information from this quantitative research. By examining 189 patients, 83 of whom had non-CAUTIs, the researchers aimed to find the statistical significance of antibiotic treatment with UTIs within 24 hours of use. All patients were in three Middle East countries, Jordan, Qatar, and Saudi Arabia.

After explaining the study and getting informed consent, registered nurses with previous experience with infection precautions gathered information by interviewing the patients individually in their rooms. This data was collected minimally over a year, concluding with three variables. The variable included age, presence of comorbidities, and antibiotic administration within 24 hours of symptom onset, which presented as statistically significant, as the "p-value was .00" for all three variables (Aloush et al., 2019, p. 750). With this information and data, the researchers concluded that comorbidities increased the risk of non-CAUTIs and significantly worsened symptoms and prolonged hospital stays. To prevent these complications, nurses must use vigilant screening for comorbidities.

### **Assumptions**

Based on this data, the authors believed there was a significant relationship between certain variables and hospital-acquired UTIs not associated with foley catheters. By finding this relationship, the researchers knew that administering antibiotics as quickly as possible to fight infection was the best way to find treatment. The researchers believed that if the nurses knew which variables to look for by screening each patient, they could administer antibiotics more

quickly. These actions would help decrease these infections, limit hospital stays, and minimize death percentages (Aloush et al., 2019).

### **Deficit/Conclusion**

Due to the evidence provided in this study, nurses must recognize and accept the author's reasoning on the significance of how different variables integrate and shape healthcare. If nurses want to decrease the number of UTIs, they should factor these variables into patient care. Nurses should screen patients to determine if their client is more likely to develop hospital-acquired UTIs (Aloush et al., 2019). Suppose a nurse fails to provide this screening. In that case, further complications can arise, such as prolonged stays in the hospital, higher hospital bills, possible urosepsis, greater chance for readmission after discharge, and higher death rates. If nurses take this extra step to prevent further and unnecessary complications, it will improve the patient's health and overall time during their hospital stay.

### **Quantitative result of a national intervention to prevent hospital-acquired catheter-associated urinary tract infection**

Even though there are many causes of urinary tract infections, such as intercourse, females having shorter urethras, or bacteria in the urinary tract, catheters pose a considerably high risk due to being an invasive procedure for the patient. Meddings et al. (2019) saw the risks to patients' health that catheters can present and wanted to look for interventions to prevent these hospital-acquired catheter-associated urinary tract infections (CAUTI) from occurring as frequently. By examining acute care, long-term care, and critical access hospitals, including both intensive and non-intensive care, the authors wanted to examine the effect of cross-media interventions for CAUTI in hospitals associated with high rates of hospital-acquired infections

(HAI) (Meddings et al., 2019). These infections, in turn, will increase hospital bills, prolong hospital stays, decrease recovery time, and negatively affect a patient's health. By utilizing a quantitative study, the authors try and find interventions to prevent these repercussions from occurring and decrease the overall number of CAUTI reported.

### **Key Points**

In this study, Meddings et al. (2019) used a quasi-experimental design with a nonrandomized, clustered, pre-, and post-comparison design to receive access from this quantitative study. The authors collected data from "387 participating hospitals from 23 states in the United States, including the District of Columbia" (Meddings et al., 2019 para. 8). Of those 387 participating hospitals, only "361 provided CAUTI-related data" (Meddings et al., 2019, para. 8). The authors examined the information by three cohorts. The authors separated the cohorts by outcomes regarding CAUTI, examinations of HAI protocols and preventions, and examinations of hospital characteristics (Meddings et al., 2019). By looking into these factors, the authors wanted to analyze all factors contributing to CAUTIs to decrease the infection rate percentages.

After examining these factors, the authors wanted to test the "STRIVE project" (Meddings et al., 2019 para. 24). This project focused on hygiene and proper use of protective equipment, as well as efforts to expand the knowledge of the Center for Disease Control's protection protocols. Researchers examined the STRIVE initiative for 12 months for pre- and post-interventions. The researchers concluded that 25% of facilities reported zero CAUTIs post-intervention. The authors did not mention a P-value for this study. However, a "95% normal-based confidence interval," CI, was calculated (Meddings et al., 2019 para. 32). This interval

implies that this study is statistically significant due to only having a 5% chance of being inaccurate. Based on this information, the researcher concluded that this study was statistically significant and would improve UTI rates.

### **Assumptions**

Based on data analyzed during this quantitative study, the authors believed there was a correlation between the percentage of CAUTIs and how hospitals managed their precaution and infection control protocols (Meddings et al., 2019). Due to the high percentages of CAUTIs, which are preventable with the correct measures, the authors believed that there were interventions that healthcare workers could use to properly prevent these infections from occurring. Using the STRIVE initiative, the authors believed they could significantly impact how hospitals properly handle and sterilize their catheters before inserting them into the urethra (Meddings et al., 2019). Due to the outcome of this study, Meddings et al. (2019) knew that this research would benefit healthcare facilities nationwide, providing solid support for proper infection control precautions to prevent UTIs associated with catheter insertion.

### **Deficit/Conclusion**

Based on the concluding evidence of this study, nurses need to realize that CAUTIs have become preventable if healthcare workers take the proper measures to do so. Suppose nurses want to care for the patient's well-being, which many will agree that nurses would. In that case, they should consider utilizing the STRIVE initiative to look at potential risks and improve catheter insertion protocol (Meddings et al., 2019). Suppose nurses need to put more effort into learning and to try to prevent CAUTIs. In that case, further health complications can arise, such as kidney infections, urosepsis, and even death if the infection is prolonged. Nurses need to have

the proper training and management to prevent these infections from happening. Nurses can avoid further complications if they use the STRIVE plan.

### **Reducing inappropriate antibiotics for urinary tract infections in long-term care: A replication study**

In the article written by Cooper et al. (2019), these authors aim to reduce the usage of unnecessary antibiotics for asymptomatic urinary tract infections in long-care health facilities. The older population is more susceptible to contracting urinary tract infections due to weaker immune systems and increased dehydration. By taking antibiotics, the geriatric community faced the risk of adverse drug reactions, experiencing resistance to the drugs, and a possible increase in diarrhea associated with the antibiotic. To protect this community from unnecessary drug usage, these authors want to advocate for this population to find a better and safer remedy for fighting against these bacterial infections.

#### **Key Points**

In this study, Cooper et al. (2019) used convenience sampling with a pre-post design to gain information from this quantitative research. By examining a 120-bed unit in a long-care health facility in the Midwest United States, specifically looking into patients admitted longer than 30 days, the researchers aimed to find statistical significance of the over usage of antibiotics to treat urinary tract infections (Cooper et al., 2019). The authors want to educate the healthcare team on the differences between urinary tract infections (UTIs) and asymptomatic bacteriuria (ASB). They want to recognize the impact of inappropriate antibiotic usage for urinary tract

infection patients, reduce treatment costs, improve resident healthcare outcomes, and enhance the patient's quality of life.

The authors collected monthly antibiotic reports by examining residents' charts, laboratory reports, and surveillance forms, analyzing which patients received antibiotic treatment and the reasoning behind the prescription (Cooper et al., 2019). The data included participants whose charts demonstrated definite evidence of antibiotic use to treat a UTI. This study further analyzed the effectiveness of the implementation of the "Cooper Urinary Tract Infection Program" (CUTIP), which aims to improve the assessment of potential UTI symptoms, decrease overdiagnosis of UTIs, and reduces inappropriate antibiotic treatments for suspected UTIs (Cooper et al., 2019, p. 1). The Cooper Urinary Tract Infection Program offered an algorithmic process supported by education to the healthcare staff to prevent inaccurate UTI diagnoses preventing unnecessary antibiotic usage (Cooper et al., 2019). By collecting data throughout two months for both pre-and post-intervention, the authors concluded that the CUTIP presented a statically significant method to prevent unnecessary antibiotic prescription with a p-value resulting in "0.02" (Cooper et al., 2019, p. 20). With this information and data, the researchers concluded that they could significantly reduce UTI rates, inappropriate antibiotic treatments, and urinalysis reports.

### **Assumptions**

Due to the overuse of antibiotics, the authors believed there was a better way of controlling which patients need antibiotics to treat a UTI than those who do not. Based on the data analyzed during the study, the authors believed there was a significant relationship between the use of CUTIP and proper antibiotic usage to assist with the recovery of UTIs (Cooper et al., 2019). By finding this relationship, Cooper et al. (2019) understood that many long-care health and

rehabilitation facilities would be affected by this discovery and hoped that many would implement this method in facilities nationwide to prevent inappropriate antibiotic usage. This method will minimize the possibility of unnecessary healthcare costs, improve the patient's recovery time, and help improve the patient's health overall.

### **Deficit/Conclusion**

Based on this information, nurses must examine the risks of administering unnecessary antibiotics to the older population. One can agree that Cooper et al. (2019) have provided sufficient evidence to make a change for the older population experiencing UTIs. If nurses want to decrease UTI rates and better the chances of recovery in the older population, they should utilize the CUTIP to find out which treatment option is best to treat UTIs and ASBs (Cooper et al., 2019). Suppose nurses refuse to use the CUTIP to help diagnose and treat UTIs. In that case, the older population can experience unnecessary antibiotics, which can cause further complications, prolonged treatment time, and increased risk of readmission. If nurses take this extra step to screen UTI symptoms to prevent further and unnecessary complications, it will improve the patient's health and overall recovery.

### **Conclusion**

UTIs are a significant concern that needs constantly updated information to try and improve patient care and reduce the number of UTI cases. Each of the studies focused on UTIs as a generalized concern, but all three had a unique subtopic that they wanted to address, which factors into UTIs concerns. Overall, all three of these articles displayed excellent quantitative

studies, which can be utilized to improve patient care and can reduce the infection rate with UTIs.

All three articles demonstrated an improvement in patient care and outcomes. These studies benefited patient care by finding better interventions to reduce the UTI rate that patients experience. Along with patient care, these studies focused on improving methods that nurses should incorporate into their practices, whether immediate antibiotic use, screening patients for proper antibiotic and treatment, or proper sterilization and hygiene to prevent UTIs from unnecessarily occurring in patients. Healthcare is a continuously evolving field that requires frequent updates and progressing knowledge and actions. Evidence-based practice plays a role in this quality improvement by allowing healthcare teams to recognize problems and discover better ways to help transform medicine for the better. All of these authors did just that. They recognized that UTIs have become a significant concern and used evidence-based practice techniques to find interventions.

## References

- Aloush, S. M., Al Qadire, M., Assmairan, K., Al sheikh, H., Mosbah, A., Hussien, H., & Al bzoor, B. (2019). Risk factors for hospital-acquired non-catheter-associated urinary tract infection. *Journal of the American Association of Nurse Practitioners*, 31(12), 747–751. <https://doi.org/10.1097/jxx.000000000000175>
- Cooper, D., McFarland, M., Petrilli, F., & Shells, C. (2019). Reducing inappropriate antibiotics for urinary tract infections in long-term care. *Journal of Nursing Care Quality*, 34(1), 16–21. <https://doi.org/10.1097/ncq.0000000000000343>
- Houser, J. (2023). *Nursing research: Reading, using, and creating evidence* (5<sup>th</sup> ed.). Jones & Bartlett Learning.
- Meddings, J., Manojlovich, M., Ameling, J. M., Olmsted, R. N., Rolle, A. J., Greene, M. T., Ratz, D., Snyder, A., & Saint, S. (2019). Quantitative results of a national intervention to prevent hospital-acquired catheter-associated urinary tract infection. *Annals of Internal Medicine*, 171(7\_Supplement). <https://doi.org/10.7326/m18-3534>