AWARENESS AND PREVENTIVE PRACTICES OF URINARY TRACT INFECTIONS AMONG FEMALE UNDERGRADUATES OF THE FACULTY OF LAW, UNIVERSITY OF BENIN

BY

ABIONA IFEOLUWA ABIMBOLA

BMS1802504

DEPARTMENT OF NURSING SCIENCE
SCHOOL OF BASIC MEDICAL SCIENCES
UNIVERSITY OF BENIN,
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APRIL, 2024

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A BACHELOR DEGREE OF NURSING SCIENCE

APRIL, 2024

DECLARATION

This is to declare that this research project titled '**AWARENESS AND PREVENTIVE PRACTICES OF URINARY TRACT INFECTIONS AMONG FEMALE UNDERGRADUATES OF THE FACULTY OF LAW, UNIVERSITY OF BENIN"** was carried out by **ABIONA IFEOLUWA ABIMBOLA**. It is solely the result of my work except where acknowledged as being derived from other person(s) or sources.

MATRICULATION NUMBER: **BMS1802504**

DEPARTMENT/SCHOOL: NURSING SCIENCE, SCHOOL OF BASIC MEDICAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY.

Signature: …….
Date: …….

CERTIFICATION

This is to certify that this project was carried out by **ABIONA IFEOLUWA ABIMBOLA** with Matriculation Number: **BMS1802504** in the Department of Nursing under the supervision of Sr. Joan. N. Chukwurah

…… ……

Abiona Ifeoluwa Abimbola **Sign and Date**

(Student)

……. ……

Sr. J. N. Chukwurah **Sign & Date**

(Project Supervisor)

…….. ……

Dr. (Mrs.) R. E. Esewe **Sign &Date**

(Head of Department)

DEDICATION

This research project work is dedicated to Almighty God for His grace and favour through the period of this research.

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ABSTRACT

Urinary tract infections (UTIs) are prevalent bacterial infections affecting millions globally, particularly females due to their unique anatomical features. Prevention and early intervention are crucial for managing UTIs and reducing healthcare burdens. The aim of this study is to investigate the awareness and preventive practices of UTIs among female undergraduates of the Faculty of Law at the University of Benin. A cross-sectional study design was employed, utilizing convenience sampling technique to select 237 respondents. Data collection was conducted using a self-structured questionnaire to address the research questions. The findings revealed varying levels of awareness among respondents, with 18.8% having good awareness, 47% moderate, and 34.1% poor awareness. Most respondents (96.1%) have heard of UTIs, with information primarily obtained from family/friends (9.13%), the internet (42.4%), and healthcare professionals (33%). The study reveals a high level of preventive practices among respondents, with 60% exhibiting a high level of preventive practices. Notably, practices such as keeping the genital area clean and dry, changing underwear daily, and staying hydrated scored highest, while practices related to menstrual hygiene scored lower. Factors influencing preventive practices include awareness of UTIs (88.6%), education/training (85.6%), living environment (67%), barriers/challenges (52.4%), misconceptions/myths (57.8%), stress/lifestyle factors (54.1%), and lack of support from resources/healthcare services (62.9%). Overall, there is no significant relationship between UTI awareness and preventive practices among these students (p=0.556, thus, failing to reject the null hypothesis. In conclusion, the findings indicate that while there is a moderate level of awareness of UTIs, there is a need for improvement in the understanding of risk factors and prevention strategies. It is therefore recommended that healthcare providers need to collaborate with educational institution in developing comprehensive UTI prevention programs, ensuring accurate information to the undergraduates.

Keywords: Awareness, Urinary tract infections, Preventive practices, Female undergraduates

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CHAPTER ONE

INTRODUCTION

1.1. Background to the study

Urinary tract infection (UTI) is a highly prevalent infection globally, ranking as the second most common infection worldwide and recognized as the most prevalent bacterial infection in humans. Each year, UTIs result in approximately 8.3 million outpatient clinic visits worldwide and approximately 100,000 hospitalizations (Tindimwebwa, 2023). About 250 million people are diagnosed with UTI each year. These infections are thought to affect 0.5 young females every year on average. Furthermore, 80% of infected individuals experience recurrent infections, which typically happen within three months of the initial infection. They are more common as people age and begin to engage in sexual activity. Urinary tract infections (UTIs) are significant health issues that can result in high morbidity rates for both males and females (Odoki et al., 2018).

The scientific research that is now accessible suggests that a number of characteristics, including education, socioeconomic level, marital status, menstrual status, nutrition, and prior UTI history, are connected to the infection (Jelly et al., 2022).

Urinary tract infection (UTI) is an age-old infection that was initially recorded in the Bears Papyrus around 1550 B.C. Ancient Egyptians described it as a condition characterized by heat emanating from the bladder. However, effective treatment was lacking until the discovery and availability of antibiotics in the 1930s. Prior to that, traditional remedies such as herbal treatments and bloodletting were the only options. Throughout the twentieth century, UTI was recognized as a collection of various clinical syndromes and diseases, exhibiting differences in epidemiology, causes, affected areas, and the severity of the condition (Mutonyi, 2023).

The prevalence of UTIs is higher in women (69%) compared to men (31%) due to the shorter length of the female urethra and this anatomical factor facilitates the easier migration of bacteria from the anus or genital area to the bladder (Akinlalu & Oladunmoye, 2022). More than 1.5million cases are reported in Nigeria annually (Aderinola et al., 2021). A urinary tract infection (UTI) refers to an infection that occurs within the urinary system. It can affect different parts of the urinary system, including the urethra (known as urethritis), kidneys (known as pyelonephritis), or bladder (known as cystitis). Around 25% to 40% of women between the ages of 20 and 40 in the United States have experienced a urinary tract infection (UTI) (Lawson et al., 2021). UTIs result in over 8million visits to healthcare providers, 1.5 million emergency visits and 300,000 hospital admissions annually in the United States (Agu et al., 2020).

Urinary tract infections (UTIs) are a prevalent issue among participants at Mwananyamala Hospital in Kinondoni district, Tanzania, as revealed by Mafuyai, et al., (2019), with 63.47% of individuals affected. Despite this high prevalence, a majority of participants (68.11%) demonstrated limited knowledge and awareness of UTIs, indicating an ongoing challenge despite previous research efforts and recommendations. Moreover, a study by Sequera and Chacko (2022) emphasized the insufficient knowledge among women regarding self-care routines and basic health practices, stressing the importance of enhancing awareness, expanding UTI prevention and treatment services tailored for women, and providing health education on UTI management. Additional research showed varying levels of awareness among participants, with 19.5% possessing sufficient knowledge, 42% having intermediate knowledge, and 35.5% lacking adequate knowledge, with 32.3% experiencing recurrent UTIs. Furthermore, a significant portion of the study group (79.66%) had average awareness about UTIs, influenced by personal experiences, family, friends, and media sources, while 20.33% remained uninformed about UTIs.

Given the significance of early detection, prevention, and management of UTIs for future health outcomes, it is imperative to increase awareness, especially among the younger population, as highlighted by Divya and Sukesh (2023). The current research aims to evaluate the knowledge and understanding of UTIs within the target population, identifying risk factors, causative organisms, and educating individuals on infection prevention measures.

1.2. Statement of Problem

Urinary tract infections (UTIs) represent a significant public health concern globally, impacting both individuals and healthcare systems. In the United States alone, UTIs incur an estimated annual cost of $1.6 billion, highlighting the substantial financial burden associated with this condition (Medina & Castillo-Pino, 2019). With approximately 152 million cases diagnosed worldwide each year, UTIs contribute to a significant morbidity rate, with about 196,500 cases recorded annually (Medina & Castillo-Pino, 2019). In Nigeria, a developing country, UTIs are prevalent, particularly among women, presenting a considerable health challenge (Onwujekwe et al., 2018).

Numerous studies conducted across Nigeria have consistently reported a high prevalence of UTIs, aligning with global trends. These studies, conducted in various regions such as Abuja, Ikare-Akoko in Ondo State, Calabar in Cross River State, and the Federal Teaching Hospital Abakaliki (FETHA) in Ebonyi State, have identified uropathogenic organisms as the causative agents of UTIs, with a higher incidence rate observed among females compared to males (Lawson et al., 2021). Despite the substantial prevalence of UTIs in Nigeria, there remains a lack of comprehensive understanding regarding individuals' awareness of UTIs and associated factors. These factors encompass various aspects, including risk factors, causative organisms, classifications, clinical manifestations, and antibiotic susceptibility patterns (Lawson et al., 2021). Addressing the burden of UTIs in Nigeria necessitates an initial

assessment of the level of awareness among the population, as increased awareness can lead to improved patient outcomes and healthcare cost savings.

During the researcher's clinical posting in the female ward of the University of Benin Teaching Hospital, numerous cases of UTIs were observed among young females. This observation prompted the need to assess the awareness and preventive practices of UTIs among female undergraduates in the Faculty of Law, University of Benin

1.3. Objectives of the study

The purpose of this study is to ascertain the awareness and preventive practices of urinary tract infections among undergraduates of the faculty of Law, University of Benin.

The Specific objectives of the study are:

1. To determine the level of awareness regarding UTIs among female undergraduates of the Faculty of Law, University of Benin.
2. To assess the level of preventive practices of UTIs among female undergraduates of the Faculty of Law, University of Benin.
3. To identity factors influencing the level of preventive practices among female undergraduates of the Faculty of Law, University of Benin.

1.4. Research Questions

1. What is the level of awareness of urinary tract infections (UTIs) among female undergraduates of the Faculty of Law, University of Benin?
2. What is the level of preventive practices of UTIs among the undergraduates of the Faculty of Law, University of Benin?
3. What are the factors affecting the preventive practices among female undergraduates of the Faculty of Law, University of Benin?

1.5. Hypothesis

There is no significant relationship between the awareness of urinary tract infections (UTIs) among female undergraduates of faculty of Law and preventive practices of UTI.

1.6. Significance of the study

For prompt diagnosis, suitable treatment, and the avoidance of recurrent infections, adequate information and comprehension of UTIs are necessary. This study will be of great relevance to the study population, to policy development, to education and for research purposes.

Study population; Health education initiatives focused on decreasing the occurrence of urinary tract infections (UTIs) and enhancing the well-being of students would be developed with the intention of enhancing students' understanding and consciousness regarding UTIs, encompassing the factors that contribute to the infection. Students can access information about UTIs through health discussions, notices posted on bulletin boards, and health campaigns that aim to raise awareness within the student community.

Findings from this study would be crucial to provide medical services, including diagnostic capabilities and treatment options, in order to effectively address the widespread prevalence of UTIs. Also, healthcare professionals, legislators, and educational initiatives can design interventions to improve UTI management, lessen the strain on healthcare systems, and improve patient outcomes by identifying knowledge gaps and assessing treatment methods.

1.7. Scope of the study

This study focuses on evaluating the knowledge, awareness and preventive practices regarding UTIs among female undergraduates of urinary tract infections (UTIs) among female undergraduates of the faculty of Law, University of Benin. It is also delimited to the objectives that guides this study.

1.8. Operational definition of terms

Awareness: refers to concern about, perception, and well informed interest in a particular situation or development.

Urinary Tract Infection: This refers to an infection in any part of the urinary system with symptoms such as pain in the lower abdomen and frequent urination. The urinary system includes the kidneys, bladder, ureters, and the urethra.

Undergraduates: This refers to the students who have graduated from high school and are currently studying in the University of Benin.

Preventive Practices: Preventive practices are actions taken by female undergraduates to reduce the risk of contracting UTIs. This includes but is not limited to:

Hygiene practices: Regular and proper hygiene habits, including wiping from front to back after urination or bowel movements, adequate hydration, and wearing breathable cotton underwear.

Sexual health practices: Safe sexual practices, such as urinating before and after sexual intercourse, using condoms, and practicing good genital hygiene.

Lifestyle modifications: Avoiding irritants such as bubble baths, feminine hygiene sprays, and spermicidal contraceptives, as well as maintaining a healthy diet and managing conditions like diabetes that may increase UTI risk.

CHAPTER TWO

LITERATURE REVIEW

This chapter focuses on the review of associated literature on awareness of urinary tract infections and preventive practices, including conceptual review, theoretical review, empirical review and summary of the review. Conceptual literature review, theoretical literature review, empirical literature review, and summary will all be covered.

2.1 Conceptual Review

2.1.1 An overview of the urinary tract

The primary job of the urinary tract is to collect, move, hold, and excrete urine, which is made up of metabolic waste produced and expelled by the kidneys. The urinary tract is made up of kidneys, ureters, bladder and urethra from its proximal to distal ends, and each of these organs is essential for maintaining the homeostasis of the urinary system. The upper urinary tract is made up of the kidneys that filter blood to produce urine and the ureters, which are bilateral tubes that convey urine from the kidneys to the bladder. The bladder is a hollow, extensible organ made up of Elastin, Collagen and smooth muscle. It takes on a tetrahedral structure when empty; when full, it transforms into an oval shape. Lastly, the urethra is a conduit that allows urine to exit the body from the bladder and links to the neck of the bladder at the distal end of the urethral sphincter (Tamadonfar et al., 2019).

2.1.2 Concept of urinary tract infections

Urinary tract infections (UTI) are inflammatory conditions of the urinary system brought on by the aberrant development of microorganisms. UTI is a condition that affects the urinary system and can result from anatomical or functional problems. A Urinary tract infection is

known to result in temporary morbidity such fever, dysuria, and lower abdominal pain as well as potential kidney scarring. Although most infections are milder, UTI can result in sepsis, a condition that can be fatal. In spite of this, UTI is extremely distressing and is expensive in terms of treatment and social support. Eight million clinic visits and over $1.6 billion in medical expenses as a result of UTI each year in the USA (Odoki et al., 2019).

Age, anatomical anomalies, gender, pregnancy, and other factors like catheterization and sexual activity all affect the prevalence of UTI. Urinary tract infections (UTI) can be caused by both gram-positive and gram-negative germs, although E. coli, a gram-negative bacterium, is the most common microbe to cause both community-acquired UTI and hospital-associated UTI. Diagnosis of UTI is crucial to avoid unfavorable conditions and lower the incidence rates of UTI for public health. Symptoms of UTI can range from non-life-threatening symptoms like vomiting and pelvic pain to serious complications like multi-organ failure and even deaths (Ozgur et al., 2020). The diagnosis of UTI involves assessing urinary symptoms and conducting a urine culture to determine the presence of a specific uropathogen above a certain threshold. Typically, this threshold is defined as $>10^3$ CFU/ml of urine, although some thresholds as high as 100,000 CFU/ml are also utilized (Coulthard, 2020). According to estimates, 50% of women will have at least one UTI episode throughout their lifetime, and 25% of those women will have recurrent UTIs making it one of the most prevalent bacterial infections (Flores-Mireles et al., 2019). The need for periodic antibiotic medication follows frequent infection recurrences. Treatment for UTIs like this encourages uropathogens to become medication resistant (Zalewska-Piatek & Piatek, 2019). Males are more likely to have UTIs when they are older because prostatic hypertrophy affects urodynamics and encourages urine retention and in infants, males are more likely to develop UTIs than girls under the age of six (Flores-Mireles et al., 2019). The most typical UTI is cystitis, although

other conditions including prostatitis, pyelonephritis, and urethritis can also develop as an infection spreads throughout the urinary system.

2.1.3 Classification of urinary tract infections

UTIs are classified according to their location in the urinary tract (such as bladder, urethra, kidneys), the presence of relevant complicating factors (example; uncomplicated and complicated), and presence/absence of symptoms (symptomatic and asymptomatic).

1. According to location; Upper tract infection involving the Kidneys (pyelonephritis) and Lower tract infections involving the Bladder and Urethra (cystitis, urethritis).

2. **Uncomplicated** is the most typical type of infection in the urinary system which develops in the absence of anatomical or functional problems.

3. **Complicated** UTI arises from any characteristic that makes a person more susceptible to infection, such as an irregular urinary tract (Sheerin & Glover, 2019).

4. **Asymptomatic** UTI is described as the presence of bacteria in the urine without any obvious symptoms, and it is commonly experienced by pregnant women. It can have major negative effects, including premature labor and low birth weight babies.

5. **Symptomatic** UTI are categorized as Upper and lower urinary tract infections, which display the typical signs of a urinary tract infection such as urinary urgency, dysuria, nocturia, haematuria, pain and high fever. Within a week, asymptomatic UTIs progress to symptomatic UTIs. A brief course of antibiotics is sometimes necessary for the treatment of asymptomatic UTI, but the risk of recurrence is considerable (Sheerin & Glover, 2023).

2.1.4 Risk factors and causative agents for urinary tract infection

2.1.4.1 Risk factors

1. Age and sex

In all age categories, women are more likely than males to have UTIs. This is as a result of the anatomy of women, whose urethra is shorter than men's and which is located relatively close to the anus. According to reports, sexually active young women have a prevalence of UTIs that ranges from 0.5 to 0.7 per person per year, whereas young men only have a 0.01 incidence rate. The prevalence of UTI, however, increases in older persons while declining during middle age. The risk of UTI in women has also been linked to a number of additional factors, including sex activity and the use of spermicides. In actuality, spermicides alter the microbial flora in the vagina, which reduces lactobacilli and promotes the growth of potentially dangerous bacteria in the genital tract. Menopause can also dramatically raise the chance of developing recurrent UTIs. In fact, the drop in estrogen levels can encourage vaginal atrophy, cause dryness and a rise in pH, which changes the vaginal flora and lowers the amount of lactobacilli, leading to the growth of potentially dangerous bacteria.

2. **Structural anomalies**

There are some renal tract diseases that can favor recurrent UTIs. These disorders in particular cause a postvoiding residual amount of urine. The protection provided by the one-directional flow of urine is diminished in conditions like neurogenic bladder and vesicoureteric reflux, which raises the risk of urinary tract infections.

3. **Genetic components**

The genetic theory is frequently cited as a risk factor for UTIs in some individuals. Women who come from families where UTIs have been documented are said to be more likely to contract the infection.

4. **Catheterization**

It is generally recognized that the use of catheters or other urine drainage devices contributes to an increased risk of recurring urinary tract infections, particularly because they serve as a reservoir for possible germs to come into touch with the bladder. According to studies, nearly all catheters left in place for longer than 4 weeks grow bacterial colonies and can obstruct urine flow, aggravating the situation (Arsene et al., 2021).

2.1.4.2. Causative Agents

Uropathogenic organisms are the most frequent culprits in UTIs, and they include Escherichia coli (causes approximately 80% of UTIs) Proteus vulgaris, Enterococcus faecalis, Staphylococcus saprophyticus, Staphylococcus aureus, Acinetobacter baumannii, Citrobacter freundii, Klebsiella pneumoniae, Proteus mirabilis, Enterobacter aerogenes, Pseudomonas aeruginosa, and Candida species (Mickymaray et al., 2019).

2.1.5 Pathogenesis of urinary tract infection

Numerous microbes are able to infect people. Proteus mirabilis, Staphylococcus saprophyticus, Enterococcus faecalis, Klebsiella pneumoniae, Escherichia coli, and Pseudomonas aeruginosa are the microorganisms. E. coli, however, is the most well-known of them all. Due to the fact that these bacteria are already present in our bodies, it is simple for the bacteria to move from the anus to the urethra, where they multiply numerous times, colonize the bladder and function as pathogens there. These bacteria have unique characteristics that enable them to stay anchored to the place. One of these characteristics is

fimbriae, which have an exceptional ability to adhere to the glycolipids and glycoproteins found on the epithelial surfaces. They avoid leaving the urinary system and flowing away with the urine in this manner. The epithelial cells serve as the sole reservoir for these microorganisms due to the microorganism's capacity to produce toxins that cause the epithelial lining to rupture and allow access to the cells. The bacteria first colonize the area's periphery, such as the perineum before moving on to the epithelial surface, where they then begin the infection (Mukherjee et al., 2023).

2.1.6 Complications

Male infants of all ages who have UTIs, as well as elderly men and women, are at risk for developing serious complications, such as frequent recurrence of infection, pyelonephritis with sepsis, infant kidney injury, preterm delivery, and side effects from repeated antibiotic use (such as severe antibiotic resistance and Clostridium difficile infection) (Yuan et al., 2021).

2.1.7 Management of urinary tract infections

Antibiotics are the cornerstone of treatment for urinary tract infections. Concerns are being raised regarding the future of treating patients with complicated and recurrent UTIs due to the rise in antibiotic resistance (Akinlalu & Oladunmoye, 2023). Amoxicillin has historically been the first-line antibiotic for UTIs, but with the rise in E. coli resistance, it has lost favor as a treatment option. Instead, studies have indicated that trimethoprim/sulfamethoxazole (TMP-SMZ) has a better cure rate. In addition to amoxicillin/clavulanate, cefixime, cefprozil, levofloxacin, nitrofurantoin, fosfomycin, and nalidixic acid are also frequently used antibiotics to treat bacterial UTIs. The rate of morbidity and mortality from bacterial infections has reduced since the introduction of antibiotics. But in recent years, these

uropathogens have developed a greater level of antibiotic resistance (Rajanbir & Rajinder, 2020).

2.1.7.1 Treatment

Since the 1940s, when sulfonamides were first introduced, antibiotics have been used to treat UTIs. Antibiotics have continued to be the most frequently advised treatment for UTIs up to this point. But rising antibiotic resistance and high rates of recurrence have considerably increased the social cost of UTIs. A flora imbalance, liver and kidney damage, and other issues can result from the overuse of antibiotics, which can also induce long-term changes in the vaginal and gastrointestinal tract's normal microbiota. To prevent the emergence of resistance and boost antibiotic efficacy, alternative medicines are being developed (Zhou et al., 2023).

Alternative and complementary medicine is a therapy that makes use of natural ingredients including probiotics, nutritional supplements, and medicinal plants to cure the condition. This medication is extremely popular in nations like the USA because it not only eliminates the infection but also aids in its prevention. Alone, complementary and alternative medicine cannot treat the urinary tract infection; this regimen needs be used with antibiotic treatment to get successful effects. Herbal medications have been effective in treating a variety of ailments because they tend to reduce bacterial resistance to antibiotics. Plants have additional chemical components that shield them from pathogenic microbial attacks. All of these characteristics can benefit a person with a UTI since they have a calming effect and aid to ward against infection (Mukherjee et al., 2023).

Probiotics: Probiotic Lactobacillus can be administered orally or vaginally and is widely known for preventing UTIs. Due to the adverse environment that lactobacilli produce, urinary bacteria cannot thrive in urine (Grin et al., 2013). Probiotics have been shown to be effective

against a variety of bacteria, and scientists are now concentrating on their role in the therapy of UTI. Probiotics are believed to play a protective effect in UTIs (Amdekar et al., 2011).

2.1.7.2 Prevention of Urinary Tract Infections

By figuring out the causes and getting treatment right away, recurrent UTI can be avoided. The National Institute for Health and Clinical Excellence recommends treating constipation, addressing defective elimination syndromes, and encouraging patients to drink more fluids so that their bladders stay free of bacteria in order to prevent recurring UTI (Shaheen et al., 2019).

- **Topical Therapy;** Some topical treatments, particularly those that contain povidone and iodine, are also used to prevent UTIs. These lotions have antibacterial properties and are applied locally to control inflammatory processes. By altering the vaginal flora, topical vaginal estriol protects post-menopausal women from UTIs (Shaheen et al., 2019).
- Maintaining proper hygiene is crucial to preventing UTIs, particularly in women who are more susceptible to infection because of their shorter urethra and closeness to the anus.
- After urinating or defecating, the perineum should be wiped from front to back to stop bacteria from moving from the anus to the urethra.
- Menstrual products must be changed consistently throughout the menstrual cycle as well.
- Drinking enough of fluids encourages frequent urination and helps to dilute urine, which helps to remove bacteria from the urinary tract before an infection develops.
- Urination right away following sexual contact.

- Avoiding irritants such as spray deodorants, powders, and tight clothing that creates a damp environment conducive to the growth of bacteria.

- Modifying one's birth control strategy, diaphragms, condoms that aren't lubricated or that have been treated with spermicides can all contribute to the development of bacteria and should be avoided (Zanaj & Vogli, 2022).

- **Vaccine Approaches**; The primary goal of vaccines for the prevention of recurrent UTIs is to protect the host from infection by enhancing the immune response to uropathogens, rather than to destroy infectious bacteria. Understanding the precise mode of action of such immunostimulants was preceded by proof of concept studies and attempts to create vaccines (Aziminia et al., 2019). As of right now, four vaccines—UroVaxom®, Urovac®, ExPEC4V, and Uromune®—are commercially accessible and have demonstrated efficacy in randomized control trials (RCTs) (Loubet et al., 2020). UroVaxom®, also known as OM-89, is made up of bacterial extracts from 18 Uropathogenic E-coli (UPEC) strains. Its effects are mediated by the capacity of bacterial components to trigger innate immune system cells in a non-specific manner (Loubet et al., 2020). Urovac® is a mucosal vaccination that comes in the form of a vaginal suppository and contains 10 different strains of heat-inactivated uropathogenic bacteria, including six different E. coli serotypes, P. vulgaris, Morganella morganii, E. faecalis, and K. pneumoniae. This vaccine preparation's goal was to include a wider variety of often implicated uropathogens and so offer comprehensive protection (Yang & Foley, 2019). ExPEC4V is made up of O-antigens from the four E. coli serotypes O1A, O2, O6A, and O25B that are administered intramuscularly in a single injection. These serotypes are a crucial method the bacterium uses to evade the immune system. In numerous phase 1 and 2 trials, this vaccine has demonstrated good safety and immunogenicity (Frenck et al., 2019). Uromune®, a novel sublingual vaccine is made up of inactivated strains of E. coli,

K. pneumoniae, Proteus vulgaris, and E. faecalis. In a prospective observational research, 59 out of 75 women (78%) who received Uromune® treatment as a once-daily sublingual spray for three months experienced no new UTIs throughout the course of treatment and the one-year follow-up period (Yang & Foley, 2018).

2.2 Theoretical review

The theoretical framework employed in this research is the Health Belief Model. The U.S. Public Health Service's social psychologists first created the HBM in the 1950s to help them understand why so many individuals were not engaging in programs aimed at preventing and detecting illness. The concept was then expanded to examine how people react to symptoms and behave in reaction to a diagnosis, especially when it comes to following treatment plans (Champion & Skinner, 2008). The Health Belief Model (HBM) postulates that a variety of factors, including perceived severity, perceived advantages, perceived obstacles, perceived vulnerability, perceived hurdles, cues to action, and self-efficacy, interact to influence behavior linked to health. The term "perceived susceptibility" describes how someone feels about their likelihood of getting a certain ailment. A person's assessment of the seriousness of a condition and its implications is known as perceived severity. Perceived benefits pertain to an individual's conviction regarding the effectiveness of a suggested health behavior in mitigating the risk or severity of a condition. When a suggested health behavior is thought to be advantageous in lessening or eliminating the perceived hazard, the perceived expense of following through on it is referred to as a perceived barrier. The degree of confidence in one's capacity to carry out the relevant health behavior is known as self-efficacy. People with poor self-efficacy will be less confident in their abilities, which will affect how likely it is that they will carry out the behavior. A wide range of health behaviors and populations have benefited

from the use of the HBM, with notable results seen in the case of preventive behaviors like diet, exercise, quitting smoking, getting vaccinated, and using contraception, as well as sick role behaviors like following doctor's orders (Kagee & Freeman, 2017).

The HBM has been extensively utilized to study the connections between health behaviors and health beliefs. For instance, several research have found a strong correlation between higher perceived susceptibility, lower barriers, higher benefits, and cues in the form of physician advice (Tehrani et al., 2014). According to this model, people are more likely to take precautions to safeguard their health if they believe they are prone to an illness or issue that could have detrimental effects. The advantages of taking any action will also exceed the drawbacks or obstacles when they believe a plan of action is available that will lessen their susceptibility. The most important model used in the creation and planning of preventative initiatives is the Health Belief Model (HBM) (Mohamed et al., 2020).

2.2.1. Constructs of the health belief model

- **Perceived Susceptibility:** This suggests that simply being aware of urinary tract infections may not be enough to motivate women to adopt preventative measures against the infection; rather, a person's perception that a woman is susceptible to or at risk for developing UTIs due to anatomical variations or lifestyle will affect their choice. (Tehrani et al., 2014).

- **Perceived Severity:** Although individual susceptibility is acknowledged, no action will be taken until the affected person believes the severity of the UTI to be high enough to cause serious medical or social complications that may not be easily treatable, such as recurrent UTI, renal failure, sepsis, adhesions, death, disability, and pain or a change in the circumstances of their job, family life, or social relationships (Tehrani et al.,2014).

- **Perceived Benefits:** Even if a person believes they are personally vulnerable to a major health illness (perceived threat), whether or not this impression results in behavior change will depend on their views or beliefs about the advantages of the recommended strategies for lowering the disease's risk, severity or threat such as the perception that the prevention of UTI will lead to a reduction in treatment costs, reduction in the possibility of recurrence and eradication of complications (Sadeghi et al., 2012).

- **Perceived Barriers:** Potential drawbacks of a particular health action, or perceived hurdles, may prevent people from engaging in advised behaviors. These include a lack of confidence in the efficacy of healthy habits for preventing UTI, adverse effects from antibiotics, a lack of interest in donning loose-fitting clothing, and embarrassment at having to follow up after taking medication.

- **Cue to action:** It speaks to the drive or desire to instill precautionary measures. The cues can be external (media, educational materials, literature, friends, family, education) or internal (history of UTI). The advantages of taking any action will outweigh the drawbacks or obstacles when they believe a plan of action is available that will lower their vulnerability.

2.2.2. Application of Theory to the Present Study

The Health Belief Model will be used by the researcher by taking into account each of its component parts. In the framework of the model's first construct, "Perceived Severity," women's awareness of the infection and their preventive actions can be greatly increased if they completely appreciate the seriousness and terrible implications connected with the development of UTI. They are therefore more likely to notice any irregularities that could manifest as symptoms and know what to do right away. It becomes clear when we take into

account the second component, "Perceived Susceptibility," that women are more likely to adopt preventative actions when they believe they are at the greatest risk for UTI. In other words, individuals need to believe that adopting the advised behavioral adjustment will considerably reduce their risk of contracting the disease. Regarding the third component, "Perceived Benefits," it is crucial to understand that taking the proper steps to avoid UTI helps to reduce infection recurrence, complications, and treatment expenses. The importance of comprehending the benefits and efficiency of doing health-promoting behaviors cannot be overstated. A woman is more likely to actively engage in these behaviors when she is aware that they can reduce the morbidity linked to UTI. .When examining the fourth element, "Perceived Barriers," it becomes clear that a decrease in attention to the health behavior's barriers may result from a rise in perceived susceptibility and severity. These obstacles could be a lack of desire to wear lose fitting clothing and pants or a lack of faith in the effectiveness of good practices for preventing UTI. The perceived advantages of establishing a preventive practice must overcome these perceived hurdles in order for people to engage in this behavior. These students will be better able to take the necessary actions that may have been prompted by internal or external cues (history of UTI, mass media), as they will be able to recognize that they are at risk for having UTI, acknowledge that it can have serious medical and social consequences, recognize that early detection and treatment may have benefits, recognize that there are obstacles to prevention measures, and have confidence in their ability to do so.

2.3 Empirical Review

2.3.1 Awareness of urinary tract infections

Generally, it has been found that awareness about urinary tract infections is above average among educated population.

A descriptive cross-sectional design by Tabassum et al. (2021) aimed to assess the knowledge and awareness of UTI among university students of Northern and Stamford Universities, Dhaka Bangladesh. A structured questionnaire on UTI was used in the study with 26 items to collect data from 403 participants. Results of the study revealed that in regard to the level of awareness; 73.66% (n=297) were adequately aware of UTI, 12.45% (n=50) had moderate levels of awareness and 13.90% (n=56) were not aware of UTI. The study revealed that the participants had a high degree of awareness, which was explained by the fact that they were pharmacy undergraduate students, and this factor was greatly influenced by their education. The majority of participants had high levels of awareness about UTIs, but some did not know about the long-term effects of the infection. In conclusion, the researchers suggested that programs be put in place to raise students' awareness of UTIs, teach them how to prevent infection, and encourage them to see doctors when necessary to lessen the suffering and morbidity associated with UTIs. This is corroborated by another study by Okafor et al. (2021) that was intended to investigate the incidence of UTI among female students of Babcock University, Ilishan Remo, Ogun state. The study had 150 students that were chosen through convenience sampling technique and the instrument for data collection was a structured questionnaire. Of the 150 students selected for this survey, only 146 of them responded. Results of the study showed that the degree of UTI awareness were fairly encouraging. Approximately 13.7% (n=20) had low level of awareness, 28 respondents (19.2%), had moderate level of awareness, and 98 respondents (67.1%), had high level of awareness. Therefore, it was concluded that most of the female Babcock University students have a high

level of understanding of UTI. According to the study, the fact that students were the target group and that UTI is a common health teaching topic for students contributed to their enhanced knowledge. The researchers further recommended that health education and health teaching should be organized for the students as it assists in depicting the importance of good personal hygiene. This study is in line with a descriptive survey design carried out by Mafuyai et al., (2019) to evaluate the awareness of urinary tract infections among female students enrolled at University of Jos. Data were gathered using a standardized questionnaire with a sample size of 185 respondents that were chosen through random sampling technique. According to the study's results, the majority of respondents (82.2%) are familiar with urinary tract infections. The study demonstrates that whereas 17.8% had not heard of UTI, 82.2% had. 80.3% of respondents knew what a UTI was, 19.7% did not, 71.1% knew the causes of UTI, 27.6% did not, and 1.3% did not respond. The survey highlighted that majority of the participants had high knowledge of UTIs. As a recommendation, the researchers suggested that awareness campaign programs should be conducted to help females to be more knowledgeable about urinary tract infection. The review of the aforementioned publications reveals that there is a high degree of awareness regarding urinary tract infections. While Tabassum et al. (2021) sampled undergraduate students in Pharmacy, Mafuyai et al. (2019) participants were undergraduate students whose course of studies were not mentioned. Though not privy to the course studied, education proved to be an indicator of high awareness of UTI demonstrating the important role it plays in imparting knowledge.

Selamat et al. (2021) cross-sectional survey was carried out to describe the awareness, knowledge and attitude levels on Urinary Tract Infection among students of Burapha University, Thailand. The respondents were chosen through non- probability sampling technique with a sample size of 91 students. A self-modified questionnaire consisting of closed ended questions was used as an instrument of data collection. The descriptive statistics

of the study showed thus; a mean score of less than 33.33 indicates low levels of awareness, 33.34-66.66 indicates moderate levels of awareness and a mean of above 66.67 indicates high levels of awareness. The study's results, with a mean score of 39.37, indicated that participants' level of awareness of UTIs was moderate. Additionally, compared to male respondents (Mean = 36.42), female respondents had marginally higher awareness (Mean =39.96). The awareness score of respondents from urban regions was also higher (mean= 40.87) than that of respondents from rural areas (mean= 37.50). Finally, the researchers explained that the respondents' moderate levels of awareness were likely due to their studies of UTI-related themes in their science curricula, as they were Burapha University science students. Regarding UTI, they said there was opportunity for improvement because doing so would undoubtedly increase relevance and significance for the services and organizations that would gain from the study. In contrast, a study conducted by Mahmood et al., (2019) aimed to assess self care practices regarding the prevention of urinary tract infections among secondary nursing students. A cross sectional descriptive design was adopted with 247 students chosen by simple random sampling technique. The instrument of data collection was a structured questionnaire sheet. The study revealed that 72.1% of the respondents had poor knowledge regarding urinary tract infections while 27.9% of them had satisfactory knowledge about UTIs. The study suggests that this may be related to the lack of fundamental knowledge they were able to gather from their research on the subject as well as the function that educational curricula had in addressing the field of knowledge. The study recommended adopting instructional strategies like seminars, facilitating group discussions, and distributing booklets and brochures to increase students' awareness in this respect.

Most of the population sampled are undergraduate students with a higher advantage of medical knowledge than the non- medical students. It would be interesting to compare results when extended beyond students with substantial medical training, and population with low

level or no education. The internet has been found to be the primary source of information about urinary tract infections, followed by friends and family, with medical professionals coming in third. With the importance of the internet in the spread of information, young people also look to social media platforms for information about UTIs. However, this should not be the only source of information regarding this because of the ubiquitousness of social media and how difficult it is to identify misinformation or disinformation on these platforms. Recent research compared information on UTI on TikTok and YouTube to determine the accuracy of information (Tam et al., 2022). Their conclusion is that YouTube videos score higher for scientific information, is more credible and contains less misinformation than TikTok.

A cross-sectional survey-based study was conducted by Jerkovic et al., (2023) among 372 female students at the University of Split, Croatia. The internet, according to 250 respondents (63.8%), is the most popular source of information on the management of UTIs. (Just above half of the respondents (57.9%) identified general practitioners as their source of information, and (49.0%) stated that family and friends came in third). For (37.2%) of the women, pharmacists served as a source of information, and for (16.6%) of the women, specialists did. Only (4.3%) people utilized magazines. This is in contrast to the cross-sectional survey study carried out by Hazwell & Sichilima, (2020) among pregnant women attending antenatal clinic sessions. Of the 120 respondents, the study revealed that Radio (20.0%), Television (23.4%), and health center/clinic (30.4%) were the most frequently cited sources of information among individuals who had received information about UTIs and their prevention. Nearly little UTI information was disseminated through other common channels including newspapers (0.0%), churches (0.0%), posters (1.7%), neighbors (4.0%), or schools (7.0%). Educational level and residential status of the participants contributed to the inadequate knowledge, awareness and preventive practices of urinary tract infections.

Another study conducted by Divya & Sukesh, (2023) showed that 1500 respondents took part in the survey. A small percentage of the participants, (20.33%) were uninformed of UTI, whereas majority (79.66%) had heard of it either through the media, family & friends or from experience. In Bangladesh, Tabassum et al. (2021) conducted research using a descriptive cross-sectional design. According to the study, out of the 403 participants, 59.55% said books were their main source of information, 19.11% said the Internet, and 10.42% said friends and family. In a cross-sectional study by Changizi et al., (2014) among 166 female students in Shadegan city, Iran. Results from the study showed that 22.3% of students had history of UTI. Approximately 34.9% of students (n=58) reported their source of information was family, 16.9% (n=28) medical practitioners, 15.7% (n=26) was mass media (radio and television), and 13.3% (n=22) by health care staff.

2.3.2 Preventive practices of urinary tract infections

Many adolescent females who attend school have been shown to have significant gaps in their knowledge and prevention strategies against UTI, which puts them at a heightened risk of contracting the illness. Ignorance of symptoms, risk factors, and hygiene practices may lead to undetected UTI, which is likely to worsen without medical attention and lead to major problems with the genital and urinary tract. This makes it imperative that educational discussions addressing these gaps be held on a regular basis. However, studies on female university students have shown that preventive measures against UTIs are encouraging and are associated with their education and other sources of UTI information. Level of education attained continues to play a positive factor even among populations that extend beyond university students.

Mafuyai et al., (2019) aimed to assess the knowledge and preventive practices of urinary tract infections among female residents in the university of Jos. The study used a descriptive survey design with a sample of 185 respondents chosen through simple random technique.

Structured questionnaire was used as the instrument for data collection. The study revealed that majority of the participants know the various prevention practices and at the same time adhere to them. According to the survey, (56.6%) of the participants wipe their perineum from front to back, (75.7%) maintain a clean genital area, and (48.7%) wear cotton underwear and loose-fitting apparel. About half of the respondents (52.7%) drink a lot of water each day, while 86.2% and 53.3% of respondents, respectively, avoid beverages that irritate the bladder and routinely empty it when full. The authors recommended the encouragement of people to use the essential preventative measures that will help to reduce the likelihood that an illness may occur. This study is in congruence with a cohort prospective study by B P et al., (2021) to assess the preventive measures of urinary tract infections among adults of South India. Using Google Forms, a 15-item anonymous questionnaire about basic UTI prevention measures was created and this was the instrument for data collection. A total of 412 respondents chosen using simple random sampling method enrolled in the study and the participants' response to the preventative measures to reduce the likelihood of UTI was highly positive. The first step to avoiding UTI is to drink lots of water, which a majority of participants do, or roughly 82.5% of them. To reduce their risk of getting a UTI, the majority of these adult South Indians urinate at least once every four hours. Participants knew how to properly clean their genitalia in 78.4% of cases. Unexpectedly, 82% of people wear cotton underwear to reduce their risk of UTI. The study demonstrated that, even if the response to UTI prevention strategies is excellent, 54.6% of the population, commonly contracts urinary tract infections; therefore, more emphasis on prevention techniques is required to create a healthy society.

In contrast, a cross sectional study conducted among nursing college students in Mosul University by Hussein et al., (2021) yielded different results. The study assessed the knowledge regarding preventive measures of UTI among the participants. A self-administered

structured questionnaire consisting of 16 items was used as the instrument of data collection and the data was analyzed using descriptive statistics. A quantitative research designed was employed. Out of the 120 students that participated in this study, about half (52.5%) of the participants had moderate knowledge regarding prevention of UTI, (36.7%) of them had poor knowledge regarding preventive measures of UTIs and only 10.8% had good knowledge. The study's findings lead the researchers to suggest that educational programs be developed for university of Mosul students to increase their understanding of the importance of UTI infections and the need for the construction of counseling and health advisory centers. This is corroborated with a study carried out by Mahmood et al. (2019) in which a descriptive cross-sectional research design was used. Its goal was to evaluate Port-Said Governorate secondary nursing students' preventive self-care practices against UTI. The scene was the Port-Said Governorate's four secondary nursing schools. Using a simple random sampling technique, 247 students were recruited, and structured interviewing questionnaires were used to collect data. Overall, the study indicates that only 37.2% of participants had satisfactory score levels while 62.8% had insufficient procedures for preventing UTI. Finally, the study by Mahmood et al., (2019) emphasized the inadequacy in the preventative practices of UTI among the participants and this was linked to the interaction between the students' knowledge and self-care behaviors. According to the study, knowledge advancement results in the adoption of healthy behaviors. In that regard, the study advised using effective instructional techniques to raise students' knowledge, such as holding seminars, leading group discussions, and distributing pamphlets and brochures. A descriptive, non-experimental design was also used by Semwal & Sharma (2020) to examine the prevalence, knowledge, and practices of teenage girls in selected community areas in Dehradun, Uttarakhand, with regard to the prevention of urinary tract infections. Information from 230 respondents—selected through the use of the total enumerate sampling technique—was gathered through structured questionnaires. With

the aid of descriptive and inferential statistics, the gathered data were tabulated, examined, and interpreted. Based on the results from the study, out of the 230 respondents, 20 (52.1%) drink 5-8 glasses of water per day, 128 (55.6%) urinate twice daily, 62(37.5%) change soaked sanitary products when necessary, 182 (79.1%) dried their underwear outside in the sun, 189(82.1%) clean their genital area with water. 99 (43%) of them change their underwear once a day, 120 (52.1%) of them clean their perineal areas with soap and water during menstruation, 23 (42.5%) teenagers clean their perineums from front to back and alarmingly, 176 (76.5%) do not wash their perineums after urinating. Overall, the study revealed that while 4.3% of the respondents had adequate knowledge about preventing urinary tract infections, the majority (90%) of the participants had only moderate knowledge, and 5.6% inadequate knowledge. The authors inferred that the adolescent girls do not maintain good personal hygiene essential for the prevention of urinary tract infections. As a recommendation, the researchers emphasized the importance of improving the girls' reproductive health, through concurrent awareness programs in schools.

2.3.3 Factors influencing the preventive practices Urinary Tract Infection

In an exploratory qualitative study design by Kabir, et al., (2021), on factors influencing sanitation and hygiene practices among students in Shahjalal University of Science and Technology Bangladesh. Through qualitative methods including interviews and focus group discussions, the study revealed that despite reasonable awareness, sanitation and hygiene practices among students were found to be remarkably low. The data was analyzed using thematic analysis. Various factors such as individual perceptions, contextual cleanliness, peer influence, and university infrastructure played crucial roles in shaping these behaviors. The study concluded that multi-level interventions addressing supply of sanitation materials, promoting low-cost interventions, improving cleaning services, and introducing gender-

sensitive infrastructure could enhance sanitation and hygiene practices among university students.

A cross-sectional observational study by Mititelu et al. (2024) aimed to evaluate the impact of behavioral factors on the incidence of urinary tract infections among 1103 respondents in the University of Medicine and Pharmacy in Craiova, Romania. Through a questionnaire-based evaluation involving predominantly female respondents, the study found significant associations between body weight, diet quality, and the frequency of urinary infections. The data was analyzed using descriptive statistics. The study further showed that obese individuals and those with unhealthy diets reported higher frequencies of urinary infections. This underscores the importance of addressing obesity, promoting healthy dietary habits, and encouraging physical activity to reduce the risk of recurring urinary infections. This is in line with the cross sectional study by Zhang et al. (2023) on the prevalence and influencing factors of lower urinary tract symptoms (LUTS) among female nurses in 42 hospitals in the Shandong Province of China from December 2020 to November, 2022. The data set was organized using a multi-center cross sectional study technique and descriptive statistics were used to analyze the data. Through an online survey involving 23,066 respondents, the study found a high (67.71%) prevalence of LUTS among female nurses, influenced by factors such as age, BMI, marital status, menstrual status, and psychological factors like anxiety and depression. The study emphasizes the importance of reproductive health awareness, healthy lifestyle habits, and supportive work environments in mitigating the risk of LUTS among female nurses.

Another cross sectional design was adopted by Mong et al., (2021) to assess nurses' level of knowledge, attitude and perceived practice regarding CAUTI and its preventive measures in a tertiary hospital in Kuala Lumpur, Malaysia. A self-administered questionnaire was utilized

to gather data from the 301 nurses who took part in the study. Descriptive statistics were used to analyze the data gathered after participants were chosen using stratified and simple random sampling approaches. According to the study, nurses' perceived practices addressing CAUTIs (catheter-associated urinary tract infections) were substantially influenced by their knowledge and attitudes. "Attitudes developed through real experience have more influence on practice than attitudes learned through indirect experience," the authors said. Their conclusion was that the study's perceived practices might have been impacted by the nurses' real-world work experiences. The study found that in order to understand the fundamental influence of attitude on nurses' perceived practice of CAUTI prevention, nursing leaders, clinical specialists, and educators must undergo a paradigm shift.

2.4. Summary of the literature review

Urinary tract infection (UTI), a widespread medical issue that has a substantial economic impact on every nation, is the leading reason for patients to be admitted to hospitals and the most frequent reason for primary care providers to prescribe antibiotics. Given their high frequency, danger of recurrence and incorrect management, as well as the fact that antibiotic resistance is increasing globally, upper and lower UTI have long been difficult for doctors to diagnose and treat. This calls for the introduction of proper antibiotic stewardship. Females are twice more likely than males to develop urinary infections, and their frequency rises with age. It is an uncommon infection that can occur anywhere in the urinary tract majorly caused by bacteria. Understanding UTI is essential to avoiding its onset and recurrence. It is impossible to overstate how important this topic is given its profound impact on people's health and potential to take lives in some extreme cases. However, prompt recovery from the illness and a reduction in the threat the infection poses are made possible by adequate treatment. The majority of findings in the literature examined showed that respondents had

fairly encouraging levels of UTI knowledge and preventative actions but some of the results also showed that respondents had low levels of awareness and preventive measures indicating a significant gap in both categories. Studies conducted among students in health-related courses were among the literature that demonstrated reasonable understanding. The main UTI information sources cited in the literature under study are the internet, mainstream media (TV & Radio), family and friend and medical professionals. This suggests a significant gap in the quality of information that influences public understanding and behaviors toward UTI prevention and management. The Health Belief Model (HBM) is the foundation of the study. It is a theoretical framework that can direct initiatives for illness prevention and health promotion. It is employed to forecast and explain personal changes in health behavior. It aids medical professionals in comprehending and influencing the behavioral aspects that affect people's willingness to engage in a certain healthy behavior.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter discusses the research methodology that was applied during this study to understand the awareness and preventive practices of urinary tract infections among female undergraduates of the Faculty of Law, University of Benin. It entails the research design, study setting, target population, sample and sampling technique, instruments of data collection, validity and reliability of instrument, method of data collection, method of data analysis and ethical consideration.

3.1 Research design

A cross sectional study design was used for the current study. Cross -sectional studies are observational studies that analyze data from a population at a single point in time. They are often used to measure the prevalence of health outcomes, understand determinants of health, and describe features of a population (Wang & Cheng, 2020). The study's design comprised a description of the occasions, circumstances, and occurrence rates of particular phenomena over the course of the study period.

3.2 Research Setting

A research setting is an environment in which studies are conducted. The research was carried out in the Faculty of Law, University of Benin, Benin city, Edo state. The University of Benin (UNIBEN) is a government owned tertiary institution, established on the 23rd of November, 1970. It is located in the Ugbowo area of Benin city, Ovia North-East local government area of Edo state. The institution gives formal training to both undergraduate and post graduate students. The faculty of law, University of Benin was established in the year 1981 in order to teach and train students who would be upright in the society and meet the

society's legal needs. Undergraduate students undergo a 5 years program in order to acquire the LL.B certificate. The faculty has produced over 15 sets of graduates.

3.3 Target Population

The target population for this study was a total of 577 female law students of the University of Benin, Benin City, Edo state.

Level	Number of female students
100	100
200	189
300	105
400	112
500	71

Source: Student Affairs Department, University of Benin.

3.5 Sample size

Sample is a subset of population selected to participate in a research study (Polit & Beck, 2017). Sample Size is the number of subjects or participants recruited and to which the study findings will be generalized. To calculate the sample size required, the Taro Yamane's formula was used

$n=N/ [1+ N (e)^2]$

Where;

n= sample size

N= the number of female law students in the faculty of law as at 2022/2023 session which was 577 students

e= the level of precision is 0.05

Therefore, the sample size n is calculated as;

$n= 577/[1+577(0.05)^2]$

n= 577/[1+1.44]

n=577/2.44

n=236.5

n=237

To calculate the sample size per level;

y= (X÷N) × n

y= Sample size per level

X= Total number of female law students per level

N= Total number of female law students as at 2022/2023

n= Sample size

Proportional sampling calculation

3.1: Distribution of sample size across all levels

Academic level	Determination of sample size in each level	Sample size per level
100	(100÷577) × 237	41
200	(189÷577) × 237	78
300	(105÷577) × 237	43
400	(112÷577) × 237	46
500	(71÷577) × 237	29

Sampling Technique

The convenience sampling technique was used in this study in which participants were selected based on their availability.

3.6 Instrument for Data Collection

The instrument that was used to collect data in this study is a self-structured questionnaire (Appendix 1). This was developed based on the objectives of the study. The questionnaire was made up of three sections with a total of 37 items in it. Close-ended questions were carefully drafted, sequenced and constructed in a bid to get in-depth information.

Section A: consists of 4 questions that elicit the demographic data of the participants (Age, Marital Status, Current Educational Level, Ethnicity).

Section B: Awareness of UTI with 11 items.

Section C: Preventive practices of UTI with 11 items.

Section D: Factors influencing the levels of preventive practices with 11 items.

Categorical responses (Yes/No) was applied for the awareness and factors items. For preventive practices items, 4 point Likerts's scale (Always/Sometimes/Rarely/Never) was used.

3.7 Validity of the Instrument

The instrument's validity pertained to its capability to accurately measure the intended construct or concept (Surucu & Maslakci, 2020). Researchers assess various validity types such as content, construct, criterion, and face validity to evaluate the instrument's accuracy. For this research, face and content validity were utilized to validate the research tool. The questionnaire underwent validation by both the project supervisor and a field expert, and necessary adjustments were implemented by the researcher before starting the main study.

3.8 Reliability of the Instrument

The reliability of an instrument referred to its stability and consistency in delivering uniform outcomes when assessing the same criteria under identical circumstances (Surucu & Maslakci, 2020). It essentially gauges how consistently the instrument produced similar results across multiple trials. A reliable instrument is one that could produce the same results if the behavior was measured again by the same scale. The Cronbach's alpha reliability technique was

employed in testing awareness and preventive practices. This research conducted reliability testing on the instrument by distributing 24 questionnaires, which constituted 10% of the total sample size of 237, to students of Benson Idahosa University (BIU) in Benin City. A coefficient of 0.71 was obtained (Appendix 2).

3.9 Method of Data Collection

A well-structured questionnaire was administered to the students until the required sample size of 237 students was achieved. The students were approached in their classrooms at the school on different days, following proper permission from the head of the department involved in the study. The purpose of the study was explained to them, and the instrument for data collection was administered. Data collection was conducted by the researcher and assisted by a research assistant who was briefed on the ethics of questionnaire administration. The data collection took place during break periods, and on-the-spot retrieval of the administered copies of the questionnaire ensured that all copies were collected on the same day. Data collection lasted for about two weeks and was carried out in the month of February, 2024.

3.10 Method of Data Analysis

The data collected was analyzed using the Statistical Package for the Social Sciences (SPSS) version 26.0. Descriptive statistics such as mean, frequency, and percentages were computed to summarize the data. Hypothesis testing was conducted using the Chi-square test of association, with the level of significance set at $p < 0.05$. The results of the analyses were then presented using tables, graphs, frequencies, and percentages to provide a clear overview of the findings.

3.11 .Ethical Consideration

Ethical approval (Appendix 3) was obtained from the ethics and research committee of the College of Medical Sciences, University of Benin. Prior to the data collection, participants

received detailed explanations about the research's purpose, content, and implications. They were assured of confidentiality, ensuring the protection of their personal and private information. Throughout the research, ethical guidelines were strictly adhered to, including the following considerations:

1. Confidentiality: Respondents' information was treated confidentially, with no request for names or addresses in the questionnaire. Participants understood that their responses were confidential and solely used for research purposes. No personal identifiers were used in any document or questionnaire to maintain anonymity.

2. Voluntary Participation: Participants were informed of their right to voluntary participation without facing penalties or bias. They could choose to withdraw or decline to provide information at any point if they felt uncomfortable or unsure.

3. Avoidance of Plagiarism: Proper citation of all authors used in the study was ensured, both within the content and in the reference page.

CHAPTER FOUR

RESULT AND FINDINGS

This chapter deals with the representation of data collected from respondents on the awareness and preventive practices of urinary tract infections among undergraduates of faculty of Law, University of Benin. A total of 237 questionnaires were distributed to female students in the faculty of Law and 229 were properly filled and valid for data analysis, giving a response rate of 97%.

Table 4.1: Socio-demographic characteristics of respondents

Variable	Frequency (n = 229)	Percent (%)
Age in years		
16-20 years	91	39.7
21-24 years	102	44.5
25-29 years	21	9.17
30 and above	15	6.55
Marital Status		
Single	191	83.4
Married	35	15.3
Widowed	2	0.87
Divorced	1	0.44
Current Academic level		
100 level	37	16.1
200level	77	33.5
300level	42	18.3
400level	45	19.7
500level	28	12.2
Ethnicity		
Edo	94	40.9
Yoruba	65	28.3
Igbo	44	19.1
Hausa	12	5.22
Others	13	5.67

Table 4.1 show the socio-demographic characteristics of the respondents in the study. It reveals that a significant portion of the participants are between 16-24 years old, with 39.7% falling in the 16-20 age group and 44.5% in the 21-24 age group. In terms of marital status, the majority of respondents are single (83.4%). Regarding academic levels, the distribution is

varied among respondents, with the highest percentage at the 200 level (33.5%) and the lowest at the 500 level (12.2%).

Table 4.2: the level of awareness regarding UTIs among female undergraduates (n=229)

Variable	Frequency (%)	Correct	Wrong	Mean	remark
Have you ever heard of Urinary Tract Infections?					
Yes	221 (96.1)	221 (96.1)	8 (3.91)	2.0	Positive
No	8 (3.91)				
If yes, what is the source of your information?					
Family/friends	21 (9.13)	227 (99.1)	2 (1.0)	2.0	Positive
Mass media (radio, television and newspaper)	33 (14.3)				
Internet	97 (42.4)				
Healthcare professionals	76 (33)				
Others	2 (0.87)				
What do you understand UTI (Urinary Tract Infection) to be?					
An infection caused by bacteria in the urinary system	112 (48.7)	112 (48.7)	117 (51.1)	1.5	Positive
A viral infection affecting the urinary system	64 (27.9)				
A result of overhydration	34 (14.8)				
All of the above	19 (8.26)				
Are you aware that antibiotics are used to treat UTI?					
Yes	89 (38.7)	89 (38.7)	140 (61.1)	1.4	Negative
No	140 (61.1)				
Females are more prone to UTI due to their short urethra?					
Yes	141 (61.3)	141 (61.3	88(38.4)	1.6	Positive
No	88 (38.4)				
Regular intake of water leads to flushing the bacteria from the urinary tract through voiding?					
Yes	137 (60)	137 (60)	92 (40)	1.6	Positive
No	92 (40)				
UTI is more common in males than females?					
Yes	65 (28.3)	164 (71.6)	65 (28.3)	1.7	Positive
No	164 (71.6)				
Frequently emptying fully loaded bladder helps in the prevention of UTI?					
Yes	132 (57.4)	132 (57.4)	97 (42.4)	1.6	Positive
No	97 (42.4)				
Are you aware that cleaning the perineum from front to back helps in prevention of UTI?					
Yes	68 (29.6)	68 (29.6)	161 (70.3)	1.3	Negative
No	161 (70.3)				
Do you know that avoiding fluids that irritate the bladder such as alcohol aids in UTI prevention?					
Yes	105 (45.9)	105 (45.9)	124 (53.9)	1.5	Positive
No	124 (53.9)				
Being sexually active predisposes females to UTI?					
Yes	97 (42.2)	97 (42.2)	132 (57.6)	1.4	Negative
No	132 (57.6)				
			Grand mean	**1.6**	

Mean cut off mark = 1.5

Table 4.2 presents a survey on UTI awareness among female undergraduates. The majority (96.1%) have heard of UTIs, mainly through family/friends (9.13%), the internet (42.4%), and healthcare professionals (33%). While 48.7% correctly identified UTIs as bacterial infections, knowledge gaps exist on risk factors and prevention. For example, awareness of antibiotic treatment is at 38.7%, and only 29.6% know about proper perineum cleaning.

Table 4.3: Classification of the level of awareness regarding UTIs among female undergraduates

Awareness level	Scoring range	Frequency (n = 229)	Percent
Good	60 above	43	18.8
Moderate	40-60	108	47
Poor	40 below	78	34.1
	Total	**229**	**100**

Table 4.3 shows the level of awareness regarding UTIs among female undergraduates, categorized into good, moderate, and poor levels based on their scoring range. The results indicate that 18.8% of the respondents have a good level of awareness, 47% have a moderate level, and 34.1% have a poor level of awareness.

Table 4.4: The level of preventive practices of UTIs among female undergraduates

Items	Always	Sometimes	Rarely	Never	Mean	Remark
How often do you clean the perineum from front to back after elimination (urination/defecation)?	54	105	43	27	2.8	High
How often do you keep the genital area clean and dry?	87	83	53	6	3.1	High
How often do you wear cotton underwear and loose-fitting clothing?	45	74	74	36	2.6	High
How often do you drink plenty of water daily?	64	43	84	38	2.6	High
How often do you empty your bladder frequently when full?	98	56	57	18	3.1	High
How often do you avoid fluids that irritate the bladder such as alcohol?	53	66	87	23	2.7	High
How often do you change your underwear daily?	106	87	30	6	3.3	High
How often do you apply feminine sprays to maintain genital hygiene?	71	63	91	4	2.9	High
How often do you change pads during menstruation every four hours?	31	13	97	88	1.9	Low
How often do you dry undergarments under sunlight after washing?	76	50	75	28	2.8	High
How often do you have your bath daily?	108	75	46		3.3	High
				Grand mean	2.8	

Mean cut-off mark = 2.5

Table 4.4 shows high levels of UTI preventive practices among female undergraduates. The highest mean score of 3.3 is for maintaining cleanliness and changing underwear daily. A mean score of 2.6 is seen for wearing cotton underwear, and staying hydrated. A mean score of 3.1 is seen for emptying the bladder frequently. Applying feminine sprays scores 2.9, while practices like proper perineum cleaning and avoiding bladder irritants score 2.8. However, changing pads frequently during menstruation scores low at 1.9. The overall grand mean score of 2.8 indicates a high level of UTI preventive practices among the respondents.

Table 4.4b shows composition of the level of preventive practices of UTIs among female undergraduates

Preventive levels	Frequency (n = 229)	Percent
High	137	60
Low	92	40
	229	**100**

Table 4.4b shows that 137 (60%) of the respondents have a high level of preventive practices, while the remaining 92 (40%) have a low level of preventive practices.

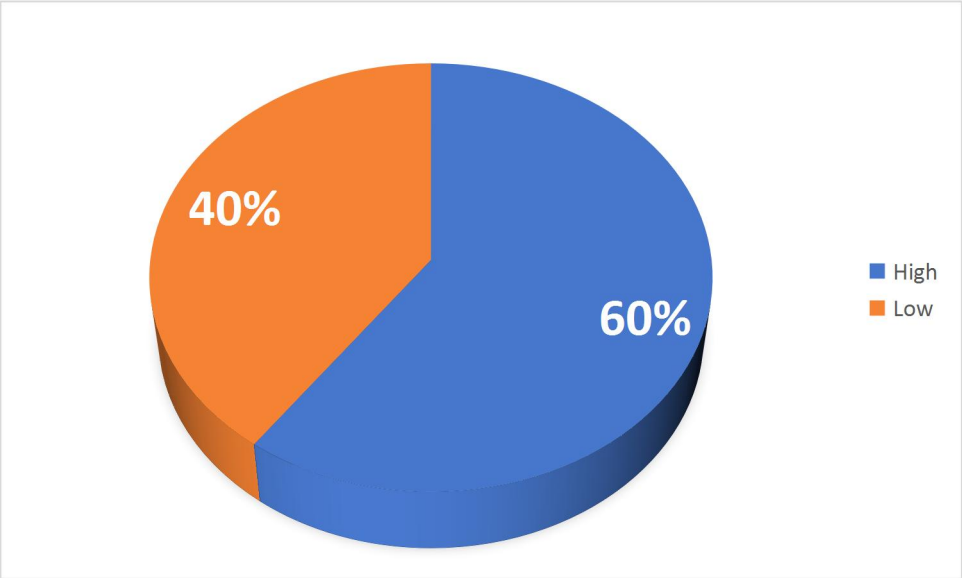

Figure 4.1: Pie Chart showing the composite level of preventive practices of UTIs among female undergraduates

Figure 4.1 show the composition of the level of preventive practices of UTIs among female undergraduates. It shows that 137 (60%) of the respondents have a high level of preventive practices, while the remaining 92 (40%) have a low level of preventive practices.

Table 4.5 Factors influencing the level of preventive practices among female undergraduates

Items	Yes %	No %	Mean	Remark
Awareness of UTIs and their consequences	203 (88.6)	26 (11.3)	1.9	Factor
Access to sanitary products and facilities	98 (42.6)	131 (57.2)	1.4	Non-factor
Cultural and societal influences	102 (44.3)	127 (55.5)	1.4	Non-factor
Peer influences and social norms	55 (24.0)	174 (75.7)	1.2	Non-factor
Barriers or challenges in implementing preventive measures	120 (52.4)	109 (47.4)	1.5	Factor
Misconceptions or myths surrounding UTIs	133 (57.8)	96 (42.0)	1.6	Factor
Stress and lifestyle factors (e.g., diet, exercise)	124 (54.1)	105 (45.7)	1.5	Factor
Lack of Support from university resources or healthcare services	144 (62.9)	85 (37)	1.6	Factor
Education and training on UTI prevention	196 (85.6)	33 (14.3)	1.9	Factor
Living environment (e.g., dormitory, off-campus housing)	153 (67)	76 (33)	1.7	Factor
Previous experience with UTIs or related complications	23 (10)	206 (90)	1.1	Non-factor

Mean cut-off mark = 1.5

Table 4.5 shows factors influencing preventive practices among female undergraduates. Key factors include awareness of UTIs and consequences (88.6%), education/training on prevention (85.6%), living environment (67%), barriers/challenges (52.4%), misconceptions/myths (57.8%), stress/lifestyle factors (54.1%), and lack of support from resources/healthcare services (62.9%). Other factors like cultural/societal influences, peer/social norms, access to sanitary products/facilities, and past UTI experiences were less significant.

Table 4.5b shows composition of the factors influencing the level of preventive practices among female undergraduates

Factor	Frequency (n = 229)	Percent
Factor	123	53.7
Non-factor	106	46.3
	229	**100**

Table 4.5b shows the composition of factors influencing the level of preventive practices among female undergraduates, with 123 (53.7%) identified as factors and 106 (46.3%) as non-factors.

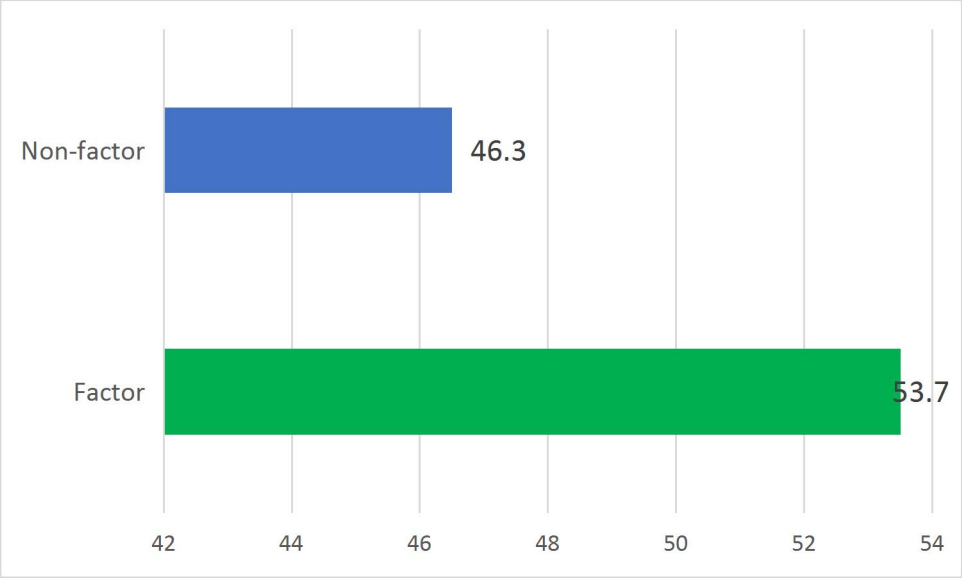

Figure 4.2: Bar Chart showing the composite of factors influencing the level of preventive practices among female undergraduates

Figure 4.2 shows the composition of factors influencing the level of preventive practices among female undergraduates, with 123 (53.7%) identified as factors and 106 (46.3%) as non-factors. The search results provide information on the factors that influence the level of preventive practices among female undergraduates.

Hypothesis testing

Ho 1. There is no significant relationship between the awareness of urinary tract infections (UTIs) among female undergraduates of the Faculty of Law and preventive practices of UTI.

Table 4.6: Relationship between the awareness of urinary tract infections (UTIs) among female undergraduates of faculty of Law and preventive practices of UTI

Level of awareness	Level of preventive practice		Test Statistics (χ^2)	df	P value	Decision
	High	**Low**				
Good	24 (72.1)	4 (27.9)	2.647[a]	2	0.556	Accepted
Moderate	76 (86.4)	11 (13.6)				
Poor	34 (67)	13 (33)				

The hypothesis test in Table 4.6 examines the relationship between the awareness of urinary tract infections (UTIs) among female undergraduates of faculty of Law and preventive practices of UTI. The test statistics ($\chi 2$) is 2.647, with degrees of freedom (df) of 2 and a p-value of 0.556. The decision is to fail to reject the null hypothesis (Ho) that there is no significant relationship between the awareness of UTIs and preventive practices of UTI among female undergraduates of faculty of Law.

Answering research question

Research question 1: What is the level of awareness of urinary tract infections (UTIs) among female undergraduates of faculty of Law, University of Benin?

Table 4.2 show the survey on the level of awareness regarding Urinary Tract Infections (UTIs) among female undergraduates. The survey shows that the majority of the respondents (96.1%) have heard of UTIs, with most of them obtaining information from family/friends (9.13%), the internet (42.4%), and healthcare professionals (33%). Regarding their understanding of UTIs, 48.7% of the respondents correctly identified it as an infection caused by bacteria in

the urinary system. However, there is a lack of knowledge about the risk factors and prevention strategies for UTIs. For instance, only 38.7% of the respondents were aware that antibiotics are used to treat UTIs. Moreover, 60% of the respondents were aware that regularly drinking water helps flush bacteria from the urinary tract, but only 29.6% knew that cleaning the perineum from front to back helps prevent UTIs. Similarly, 45.9% of the respondents were aware that avoiding fluids that irritate the bladder, such as alcohol, aids in UTI prevention, but only 42.2% knew that being sexually active predisposes females to UTIs. The survey also reveals that there is a need for health education on UTI prevention strategies, as only 1.6% of the respondents had a mean score of 1.6, which is higher than the mean cut-off mark of 1.5. indicating the respondents have moderate knowledge on UTI.

Research question 2: What is the level of preventive practices of UTIs among the undergraduates of faculty of Law, University of Benin?

Table 4.4 show the level of preventive practices of UTIs among female undergraduates is high. The highest mean score of 3.3 is observed for keeping the genital area clean and dry, having a bath daily, and changing underwear daily. The mean score of 3.1 is observed for wearing cotton underwear and loose-fitting clothing, drinking plenty of water daily, and emptying the bladder frequently when full. The mean score of 2.9 is observed for applying feminine sprays to maintain genital hygiene, and the mean score of 2.8 is observed for cleaning the perineum from front to back after elimination, drying undergarments under sunlight after washing, and avoiding fluids that irritate the bladder such as alcohol. However, the mean score of 1.9 is observed for changing pads during menstruation every four hours, indicating a low level of preventive practices in this regard. The grand mean score of 2.8 which is higher than the critical mean of 2.5, indicating a high level of preventive practices of UTIs among female undergraduates.

Research question 3: What are the factors affecting the preventive practices among

female undergraduates of faculty of Law, University of Benin?

Table 4.5 show factors influencing the level of preventive practices among female undergraduates. The highest percentage of respondents, 88.6%, reported being aware of UTIs and their consequences, indicating that awareness is a significant factor. Education and training on UTI prevention were also reported by 85.6% of respondents, suggesting that education plays a crucial role in promoting preventive practices. The living environment was a factor for 67% of respondents, indicating that the physical surroundings can impact preventive practices. Barriers or challenges in implementing preventive measures were reported by 52.4% of respondents, suggesting that there are obstacles to practicing preventive behaviours. Misconceptions or myths surrounding UTIs were reported by 57.8% of respondents, indicating a need for accurate information and education. Stress and lifestyle factors were reported by 54.1% of respondents, suggesting that these factors may affect preventive practices. Lack of support from university resources or healthcare services was reported by 62.9% of respondents, highlighting the importance of support systems in promoting preventive practices. Cultural and societal influences, peer influences and social norms, access to sanitary products and facilities, and previous experience with UTIs or related complications were not significant factors, with percentages of 44.3%, 24.0%, 42.6%, and 10%, respectively.

CHAPTER FIVE

DISCUSSION AND FINDINGS

This chapter discusses the major findings of the research compared with the literature reviewed, the implication for nursing, summary, conclusion, Recommendations and Suggestions for further Studies.

5.1. Discussion of major Findings

Awareness regarding urinary tract infections (UTIs)

The results indicate that the overall level of awareness is moderately positive, with 18.8% of the respondents exhibiting a good level of awareness, 47% having a moderate level, and 34.1% demonstrating a poor level of awareness. These findings are inconsistent with the results reported in the previous studies. For instance, the study by Tabassum et al. (2021) conducted among university students in Bangladesh found that 73.66% of the participants were adequately aware of UTIs, while 12.45% had moderate levels of awareness and 13.90% were not aware. Similarly, the study by Okafor et al. (2021) among female students in Babcock University, Nigeria, revealed that 67.1% had a high level of awareness, 19.2% had moderate awareness, and 13.7% had low awareness. The relatively high level of awareness observed in these studies, including the current one, can be attributed to the fact that the participants were university students, who are generally more educated and have greater access to health-related information compared to the general population. (As highlighted in previous studies, the educational background and field of study of the participants play a significant role in their level of awareness, with medical and science students typically demonstrating higher levels of knowledge about UTIs. However, it is noteworthy that even among the highly educated university student population, there are still gaps in specific knowledge areas related to UTIs. The current study reveals that while a majority of the respondents were aware of the general concept of UTIs, their understanding of the causes,

symptoms, treatment, and preventive measures was relatively lower. For instance, only 38.7% were aware that antibiotics are used to treat UTIs, and only 29.6% knew that cleaning the perineum from front to back helps prevent UTIs.

Preventive Practices of urinary tract infections (UTIs)

The results indicate that a significant proportion of the respondents, 60%, exhibit a high level of preventive practices, while the remaining 40% have a low level of preventive practices. These findings are largely consistent with the results reported in the previous studies. For instance, the study by Mafuyai et al. (2019) conducted among female university students in Nigeria found that the majority of the participants knew and adhered to various UTI prevention practices, such as wiping the perineum from front to back, maintaining a clean genital area, and drinking plenty of water daily. Similarly, the study by B P et al., (2021) among adults in South India revealed a highly positive response to UTI prevention measures, with a majority of the participants engaging in practices like drinking lots of water, properly cleaning their genitals, and wearing cotton underwear. These findings suggest that the level of preventive practices for UTIs tends to be relatively high among educated populations, particularly those with access to relevant health information and awareness. However, it is important to note that even in the context of the current study, where the overall level of preventive practices is considered high, there are still some areas that require attention. For instance, the study found that only 31 out of 229 respondents (13.5%) reported changing their pads during menstruation every four hours, which is a critical practice for maintaining genital hygiene and preventing UTIs. This finding is consistent with the study by Semwal and Sharma (2020), which examined the knowledge and practices related to UTI prevention among teenage girls in India. The researchers found that the majority of the respondents did not maintain good personal hygiene practices essential for UTI prevention, including washing the perineal area after urination. The discrepancy between the high overall level of preventive

practices and the lower adherence to specific hygiene-related behaviors highlights the need for targeted interventions to address these gaps. This could involve incorporating more comprehensive UTI-related content into the curriculum, organizing awareness campaigns, and providing easy access to reliable information sources that emphasize the importance of maintaining proper genital and menstrual hygiene. Furthermore, the findings from the studies suggest that the level of preventive practices may not be solely dependent on educational background or access to information. The study by Hussein et al. (2019) among nursing college students in Iraq, for instance, found that a significant proportion of the participants had moderate to poor knowledge and preventive practices regarding UTIs.

Factors that influence the level of preventive practices for urinary tract infections (UTIs).

The findings indicate that 53.7% of the respondents identified certain factors as influencing their preventive practices, while 46.3% did not consider these factors to be significant. These findings align with the insights provided in the additional studies. For instance, the study by Kabir et al. (2021) conducted among university students in Bangladesh highlighted how individual perceptions, peer influence, and university infrastructure can shape sanitation and hygiene practices, which are closely related to the prevention of UTIs. Similarly, the study by Mititelu et al. (2024) emphasized the importance of addressing behavioral factors, such as obesity and unhealthy dietary habits, in reducing the risk of urinary infections. This echoes the current findings, which identified stress and lifestyle factors, including diet and exercise, as one of the key influencing factors among the female undergraduates. Furthermore, the study by Zhang et al. (2023) on the prevalence and influencing factors of lower urinary tract symptoms (LUTS) among female nurses underscores the impact of individual characteristics, such as age and psychological factors, as well as the role of a supportive work environment in mitigating the risk of such conditions. The study highlights key factors influencing the level

of preventive practices for UTIs among female undergraduates. These factors include awareness of UTIs and their consequences, with 88.6% of respondents recognizing its importance. Barriers or challenges in implementing preventive measures were identified by 52.4% of respondents, emphasizing the need to address practical obstacles. Misconceptions or myths surrounding UTIs were considered by 57.8% of respondents, indicating the importance of dispelling inaccurate beliefs. Lack of support from university resources or healthcare services was noted by 62.9% of respondents, suggesting a need for improved access to resources. Education and training on UTI prevention were viewed as crucial by 85.6% of respondents. The living environment, such as dormitory or off-campus housing conditions, was also found to influence preventive practices, with 67% of respondents recognizing its impact.

It is worth noting that the study also identified some factors that were not considered significant by the majority of the respondents, such as access to sanitary products and facilities, cultural and societal influences, and previous experience with UTIs or related complications. While these factors may not have been identified as significant in this particular study, they should not be entirely dismissed, as they may still play a role in shaping preventive practices in different contexts or populations.

Hypothesis

Relationship between Awareness and Preventive Practices

The hypothesis testing, which utilized a chi-square ($\chi 2$) analysis, revealed a p-value of 0.556, which is greater than the standard significance level of 0.05. This indicates that the null hypothesis, which stated that there is no significant relationship between UTI awareness and preventive practices, cannot be rejected. In other words, the level of awareness that the female undergraduates possess does not necessarily translate into the adoption of effective preventive measures against UTIs. This finding stands in contrast to the insights provided by studies such as Mafuyai et al. (2019) and Mahmood et al. (2019), which highlighted a

positive relationship between knowledge and the implementation of UTI prevention practices among university students. These previous studies suggested that enhancing students' understanding of UTIs through educational interventions could lead to the adoption of healthier behaviors and better self-care practices.

5.2 Implication to nurses

The findings of this research have significant implications for nurses, highlighting their crucial role in enhancing awareness and preventive practices related to urinary tract infections (UTIs) among female undergraduates. Nurses are uniquely positioned to educate and train individuals on UTIs, covering essential topics such as causes, symptoms, treatment, and prevention measures. By creating educational materials and organizing targeted awareness initiatives for female undergraduates, nurses can substantially improve their understanding and knowledge of UTIs. Additionally, nurses can actively promote UTI preventive practices through personalized counseling, group sessions, and community outreach efforts. By offering practical advice on hygiene routines like perineum cleansing, genital hygiene maintenance, and suitable underwear choices, nurses empower female undergraduates to adopt healthier habits and lower their UTI risk. Dispelling misconceptions and myths surrounding UTIs is another critical task for nurses. By providing accurate information and dispelling common misconceptions, nurses assist individuals in making informed health decisions. Through evidence-based materials and open dialogues, nurses play a pivotal role in ensuring that female undergraduates grasp UTIs and how to prevent them effectively. Moreover, nurses can advocate for improved access to essential resources and healthcare services crucial for UTI prevention and care. This advocacy includes pushing for access to sanitary products, healthcare facilities, and educational resources. Through collaboration with healthcare colleagues, policymakers, and community groups, nurses can work towards eliminating access barriers and promoting equitable healthcare for female undergraduates.

Lastly, interdisciplinary teamwork among healthcare professionals is vital for crafting comprehensive UTI prevention programs tailored to the specific needs of female undergraduates. By leveraging the expertise and resources of diverse healthcare professionals, nurses can implement successful strategies for UTI prevention and management, ultimately enhancing the overall health and well-being of female undergraduates.

5.3 Summary

The study investigates the awareness and preventive practices of urinary tract infections (UTIs) among female undergraduates of the Faculty of Law, University of Benin, utilizing a cross-sectional study design. A total of 237 participants were selected using the convenience sampling technique. Data collection was conducted through a self-structured questionnaire designed specifically for this study. The results regarding awareness of UTIs revealed that the majority (96.1%) of respondents had heard of UTIs, with information primarily obtained from family/friends, the internet, and healthcare professionals. However, knowledge gaps were evident in areas such as understanding UTI causes, symptoms, treatment and preventive strategies. For instance, only 48.7% correctly identified UTIs as bacterial infections, and proper perineum cleaning was relatively low. In terms of preventive practices, the study found a high level of engagement among respondents. Practices such as keeping the genital area clean and dry, wearing cotton underwear, and drinking plenty of water received high mean scores. However, there were areas of concern, notably in changing pads during menstruation, where adherence was low. Factors influencing preventive practices were also explored, with significant percentages of respondents citing factors such as awareness of UTIs, education and training, living environment, barriers/challenges, misconceptions/myths, stress/lifestyle factors, and lack of support from resources/healthcare services.

5.4 Conclusion

The study on the awareness and preventive practices of urinary tract infections (UTIs) among female undergraduates of the Faculty of Law at the University of Benin provides valuable insights into the current state of knowledge and practices regarding UTIs among this population. The findings indicate that while there is a moderate level of awareness of UTIs, there is a need for improvement in the understanding of risk factors and prevention strategies. The majority of the participants have heard of UTIs, but there is a lack of knowledge about the causes, symptoms, and appropriate preventive measures. The study also reveals that preventive practices among the participants are generally high, with factors such as awareness, education, and living environment influencing these practices. However, there is still room for improvement, particularly in areas such as changing pads during menstruation every four hours.

5.5 Limitations of the study

The data collected relied on self-reporting through questionnaires, which could introduce response bias. Participants may provide answers they believe are socially desirable rather than their true opinions or behaviours.

5.6 Recommendations:

Based on the study results, it is recommended that:

- Nursing should lead the development and implementation of educational programs, promote hygiene practices, address misconceptions, and advocate for resources.
- Healthcare Providers should collaborate to develop comprehensive UTI prevention programs, provide accurate information, and ensure access to essential resources.
- University administrators should support the implementation of educational programs, allocate resources for awareness campaigns, and promote healthy lifestyle choices.
- Student organizations can collaborate to organize awareness campaigns, workshops, and seminars, and promote healthy lifestyle choices among female undergraduates.

- Community Partners such as non-governmental organizations (NGOs) collaborate with healthcare facilities, and local government agencies to help expand the reach and impact of awareness campaigns and educational programs.
- Policy Makers should Advocating for policies that support UTI prevention and management, such as improving access to sanitary products and healthcare facilities, can have a significant impact on the health outcomes of female undergraduates.

5.7 Suggestion for Further study

Further research should delve into evaluating the effectiveness of health education activities on prevention and management of UTIs at the school level, as these interventions could help reduce the burden of UTIs among female undergraduates.

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APPENDIX I: QUESTIONNAIRE
DEPARTMENT OF NURSING SCIENCE
SCHOOL OF BASIC MEDICAL SCIENCES

UNIVERSITY OF BENIN

BENIN CITY, EDO STATE

Dear Respondent,

I am a 500 level Nursing student in the above-named institution. I am carrying out a research study on the AWARENESS AND PREVENTIVE PRACTICES OF URINARY TRACT INFECTIONS AMONG FEMALE UNDERGRADUATES OF FACULTY OF LAW, UNIVERSITY OF BENIN. As your contribution to the research, the questions are meant to generate reliable information. Your honest answers are appreciated and will be treated confidentially. This questionnaire is purely designed for academic research and will not be used for any other purpose.

SECTION A: SOCIO- DEMOGRAPHIC DATA

Please tick the right responses that best suggests your answer or option:

1. Age: 16-20 [ ] 21-24 [ ] 25-29 [ ] Above 30 [ ].
2. Marital Status: Single [ ] Married [ ] Divorced [ ] Widow/Widower [ ]
3. Current Educational Level: 100 [ ] 200 [ ] 300 [ ] 400 [ ] 500 [ ]
4. Ethnicity: Edo [ ] Yoruba [ ] Igbo [ ] Hausa [ ] Others[ ]

SECTION B: LEVEL OF AWARENESS OF URINARY TRACT INFECTIONS

1. Have you ever heard of Urinary Tract Infections? Yes [ ]; No[ ]
2. If yes, what is the source of your information? Family/friends [ ]; Mass media (Radio, Television, Newspapers) [ ]; Internet [ ]; Healthcare Professionals [ ]; Others [ ] (specify).

3. What do you understand UTI (Urinary Tract Infection) to be? a) An infection caused by bacteria in the urinary system ( ) b) A viral infection affecting the urinary system ( ) A result of overhydration ( ) d) all of the above
4. Are you aware that antibiotics are used to treat UTI? Yes ( ) No ( )
5. Females are more prone to UTI due to their short urethra? Yes ( ) No ( )
6. Regular intake of water leads to flushing the bacteria from the urinary tract through voiding? Yes ( ) No ( )
7. UTI is more common in males than females? Yes ( ) No ( )
8. Frequently emptying fully loaded bladder helps in the prevention of UTI? Yes ( ) No ()
9. Are you aware that cleaning the perineum from front to back helps in prevention of UTI? Yes ( ) No ( )
10. Do you know that avoiding fluids that irritate the bladder such as alcohol aids in UTI prevention? Yes ( ) No ( )
11. Being sexually active predisposes females to UTI? Yes ( ) No ( )

SECTION C: PREVENTIVE PRACTICES OF URINARY TRACT INFECTIONS

Please express your level of agreement with the listed items within the table provided:

S/N	Items	Always	Sometimes	Rarely	Never
12.	How often do you clean the perineum from front to back after elimination (urination/defecation)?				
13.	How often do you keep the genital area clean and dry?				
14.	How often do you wear cotton underwear and loose-fitting clothing?				

15.	How often do you drink plenty of water daily?				
16.	How often do you empty your bladder frequently when full?				
17.	How often do you avoid fluids that irritate the bladder?				
18.	How often do you change your underwear daily?				
19.	How often do you apply feminine sprays to maintain genital hygiene?				
20.	How often do you change pads during menstruation every four hours?				
21.	How often do you dry undergarments under sunlight after washing?				
22.	How often do you have your bath daily?				

SECTION D: FACTORS INFLUENCING THE PREVENTIVE PRACTICES OF URINARY TRACT INFECTIONS

s/n	Items	Yes	No
23.	Awareness of UTIs and their consequences		
24.	Access to sanitary products and facilities		
25.	Cultural and societal influences		
26.	Peer influences and social norms		
27.	Barriers or challenges in implementing preventive measures		
28.	Misconceptions or myths surrounding UTIs		
29.	Stress and lifestyle factors (e.g., diet,		

	exercise)		
30.	Support from university resources or healthcare services		
31.	Education and training on UTI prevention		
32.	Living environment (e.g., dormitory, off-campus housing)		
33.	Previous experience with UTIs or related complications		

APPENDIX II
RELIABILITY OF INSTRUMENT

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.71, 0.70, 0.71	.722	42

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Age	87.2750	26.981	-.048	.081
Marital status	87.2688	26.210	.126	.072
Current educational level	87.8938	26.599	.037	.059
Ethnicity	86.6438	23.099	.167	-65
Level of education	86.4625	25.533	.080	.040
Have you ever heard of Urinary Tract Infections?	87.2375	27.176	.000	.072
If yes, what is the source of your information?	87.2563	26.368	.048	.075
What do you understand UTI (Urinary Tract Infection) to be?	87.0688	27.473	-.114	.076
Are you aware that antibiotics are used to treat UTI?	87.2500	26.994	-.039	.077
Females are more prone to UTI due to their short urethra?	87.5188	26.842	-.036	.079
Regular intake of water leads to flushing the bacteria from the urinary tract through voiding?	87.4563	26.904	-.042	.080
UTI is more common in males than females?	87.0438	26.092	.045	.079
Frequently emptying fully loaded bladder helps in the prevention of UTI?	87.2500	26.176	.077	.081
Are you aware that cleaning the perineum from front to back helps in prevention of UTI?	87.4500	25.582	.125	.071
Do you know that avoiding fluids that irritate the bladder such as alcohol aids in UTI prevention?	87.0500	27.192	-.082	.093
Being sexually active predisposes females to UTI?	87.3188	27.590	-.123	.099
How often do you clean the perineum from front to back after elimination (urination/defecation)?	87.4813	26.138	.053	.092
How often do you keep the genital area clean and dry?	87.2313	27.034	-.044	.078
How often do you wear cotton underwear and loose-fitting clothing?	87.2875	26.533	.021	.082

How often do you drink plenty of water daily?	87.4625	26.917	-.043	.080
How often do you empty your bladder frequently when full?	87.2625	26.811	-.016	.072
How often do you avoid fluids that irritate the bladder such as alcohol?	87.2688	27.544	-.116	.096
How often do you change your underwear daily?	87.0750	26.560	-.009	.071
How often do you apply feminine sprays to maintain genital hygiene?	87.2563	26.141	.086	.076
How often do you change pads during menstruation every four hours?	87.4375	25.757	.101	.088
How often do you dry undergarments under sunlight after washing?	87.6125	26.415	.105	.098
How often do you have your bath daily?	87.6125	27.635	-.136	.091
Awareness of UTIs and their consequences	87.6063	26.630	.062	.076
Access to sanitary products and facilities	87.6125	26.956	-.013	.077
Cultural and societal influences	87.5875	26.760	.038	.080
Peer influences and social norms	87.5938	26.658	.058	.097
Barriers or challenges in implementing preventive measures	87.6063	26.844	.019	.083
Misconceptions or myths surrounding UTIs	87.5938	27.337	-.078	.081
Stress and lifestyle factors (e.g., diet, exercise)	87.6438	27.325	-.076	.081
Lack of Support from university resources or healthcare services	87.5938	26.658	.058	.077
Education and training on UTI prevention	87.6063	26.982	-.008	.088
Living environment (e.g., dormitory, off-campus housing)	86.2063	25.045	.107	.077
Previous experience with UTIs or related complications	86.2813	26.719	-.064	.095
Awareness of UTIs and their consequences	86.3500	25.675	.024	.090
Access to sanitary products and facilities	86.3000	24.714	.114	.081
Cultural and societal influences	86.3125	25.587	.034	.056
Peer influences and social norms	86.2563	26.280	-.019	.077

Comment: The reliability analysis using Cronbach's Alpha, yielding a result of 0.71 for the overall scale. Additionally, the Cronbach's Alpha of 0.722 when the items are standardized. These values suggest a good level of internal consistency among the items in this scale.

RESEARCH ETHICS COMMITTEE

COLLEGE OF MEDICAL SCIENCES
UNIVERSITY OF BENIN, BENIN CITY, NIGERIA.

Chairman: Prof. F. A Imarhiagbe
MBChb, FMCP
Cert Clin Res and ethics(NIH),MD.
0803449092

P.M.B 1154, BENIN CITY
Email: researchethics.cms@gmail.com

Our Ref: CMS/REC/01/VOL.2/526 **Date:** 4th April, 2024

Re: AWARENESS AND PREVENTIVE PRACTICES OF URINARY TRACT INFECTIONS AMONG FEMALE UNDERGRADUATES OF THE FACULTY OF LAW, UNIVERSITY OF BENIN.

Name of Principal Investigator: **ABIONA IFEOLUWA ABIMBOLA**
Department Of Nursing Sciences
School Of Basic Medical Sciences
College Of Medical Sciences
University Of Benin
Benin City.

REC Approval No: **CMS/REC/2024/526**

This is to inform you that the research described in the submitted proposal, the Informed Consent Forms and other participant information materials have been reviewed and approved by the College Research Ethics Committee, University of Benin.

This approval dates from **4th April, 2024 to 5th April, 2025.** In multi-year research, Endeavour to submit your annual report to the REC early in order to obtain renewal of your approval and avoid disruption of your research.

The National Code of Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the code including ensuring that all adverse events are reported promptly to the REC. No, changes are permitted in the research without prior approval by REC except in circumstances outlined in the code. REC reserves the right to conduct compliance visit to your research site without prior notice.
Thank you.

PROF. F.A IMARHIAGBE
Chairman, REC