KNOWLEDGE OF URINARY TRACT INFECTONS AND ITS ASSOCIATED RISK FACTORS AMONG PREGNANT WOMEN IN UNIVERSITY OF BENIN TEACHING HOSPITAL, EDO STATE.

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UNIVERSITY OF BENIN,

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IN PARTIAL FUFILLMENT OF THE REQUIREMENT FOR THE AWARD OF BACHELOR OF SCIENCE IN NURSING.

SEPTEMBER, 2023.

DECLARATION

This is to declare that this research project titled **Knowledge of Urinary Tract Infections and its Associated Risk Factors Among Pregnant Women in University of Benin Teaching Hospital, Edo State** was carried out by **EHIABHI UYIOSAIFO FRANCES** and is solely the result of my work except where acknowledged as being derived from other person(s) or resources.

MATRICULATION NUMBER: **BMS1702148**

DEARTMENT/SCHOOL: NURSING SCIENCE/SCHOOL OF BASIC MEDICAL SCIENCES, UNIVERSITY OF BENIN

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DATE: _____

CERTIFICATION

This is to certify that this research project by **EHIABHI UYIOSAIFO FRANCES** with matriculation number **BMS1702148** has been examined and approved for award of **"Bachelor of Nursing Certificate"**

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(Project Supervisor)

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Signature: _____ **Date:** _____

EXTERNAL EXAMINER

ABSTRACT

This study was conducted to assess the knowledge of Urinary Tract Infection and its associated risk factors among among pregnant women in the University of Benin Teaching Hospital, Edo State. The study employed a Non-experimental survey research design. The target population for this study consisted of 250 women with a minimum sample size of 169 pregnant women (calculated using Taro Yamane formular) which comprises of outpatients who are currently attending Ante-Natal clinic at the University of Benin Teaching Hospital (UBTH), Edo State. The researcher used convenient sampling technique in selecting the respondents into the study. A self-designed simple questionnaire was used to elicit data. The questionnaire was made up of four sections (A, B, C and D). Section A was made up of patients Bio-data while the other sections comprised of Simple structured questions used to elicit information on the knowledge and behavioural practices regarding Urinary Tract Infections among pregnant women in University of Benin Teaching Hospital, Edo State. The data was presented using tables and were analyzed using simple percentages, while research hypotheses was tested using Chi-square test of association. The level of significance was set at $p<0.05$. The procedure was carried out using the Statistical Package for Social Sciences (SPSS) version 24.0 for windows. The result shows that majority of the respondents had sound knowledge of UTI and its associated risk factors. Thus, this study recommends achieving the optimum goal of improving health in UTI, by creating effective strategies and active involvement of patients in the management of their health. This was a study that added to the body of knowledge on UTI among pregnant women in this part of Nigeria.

Keywords: Knowledge, Associated risk factors, UTI, Pregnant women

DEDICATION

This research work is dedicated to God Almighty who gave me the wisdom and fortitude I needed to see me through the period of training, to my lovely parents, Mr. and Mrs. Ehiabhi, to my beautiful siblings and lastly, to the profession for all good it is worth.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study.

Urinary Tract Infections (UTIs) are inflammation that occurs along the entire urinary tract which is as a result of microorganism's invasion of tissues of the urinary tract. Infection of the bladder (cystitis) and infection of the urethra (pyelonephritis) represents the majority of these UTIs. Microorganisms such as Escherichia coli, Enterobacter, Pseudomonas aeruginosa, Staphylococcus saprophyticus, Proteus mirabilis and Klebsiella pneumoniae causes UTI. However, Escherichia coli bacteria is the main cause of UTIs and it causes 70% to 95% of both upper and lower UTIs (Brusch, 2020). It is a common bacterial infection found mostly among women due to the anatomical structure of the urethra which is shorter and wider compared to that of men. Also, pregnant women are at a higher risk of acquiring this infection as a result of the changes in hormone levels and immune system function which are induced by gestation.

The urinary tract consists of both the upper urinary tract such as the kidney, renal pelvis and ureters while the lower urinary tract consists of the bladder and urethra. These organs function in manufacturing, collecting, storing and emptying urine from the human body. Once microorganisms enter the urinary tract, they spread to parts of the tract such as the urethra, bladder, ureters and kidney where they multiply especially in a case of urine stasis in the bladder. This leads to inflammation of the tract and subsequently clinical manifestations. A study in Enugu metropolis carried out to determine the prevalence of UTI among pregnant women showed that out of 384 subjects' urine screened, 282 cases of UTI were diagnosed in the hospitals under study (Ezugwu, Afunwa et. al. 2021). It was deduced that the UTI prevalence among pregnant women in Enugu metropolis was 73% of the 384 samples that

were screened. This is very high compared to the prevalent rate from other states in the country such as Ebonyi which recorded 46.5%, Ilorin, North Central Nigeria recorded 35.5%, Kano, Northern Nigeria recorded 31.6% and Benin, Southern Nigeria with 32.7% recorded (Ezugwu, Afunwa et. al. 2021).

The term Urinary Tract Infections represents a variety of conditions such as urethritis, cystitis, acute pyelonephritis and pyelonephritis with bacteremia or sepsis (Ezugwu, Afunwa et al. 2021). UTI is one of the most seen medical complications of pregnancy and is a significant cause of maternal and fetal morbidities if left untreated (Ezugwu, Afunwa et al. 2021). In previous studies carried out, possible complications of UTIs in pregnancy include Renal dysfunction (usually transient but as many as 25% of pregnant women with pyelonephritis have a decreased glomerular filtration rate) (Platte, 2021). Septic shock though it is a rare occurrence, increased risk in pregnant women of delivering premature infant, pre-term labour and pre-eclampsia. From a study carried out in the Filipinos, it can be deduced from this that UTIs are closely associated with the adverse feto-maternal complications (Navarro, Tiongco, 2019). Knowledge is a familiarity, awareness, or understanding of someone or something, such as facts (propositional knowledge), skills (procedural knowledge), or objects (acquaintance knowledge). The knowledge of Urinary Tract Infections among pregnant women also influences the incidence and prevalence of this disease. Urinary tract infection (UTI) during pregnancy is assumed to be associated with increased maternal and fetal morbidity and mortality; hence, a proper assessment of knowledge and practices is crucial to formulate preventive strategies to ensure the health of both the mother and the baby. (Navarro, et al. 2019).

In Okada, a rural community in the Ovia North East Local Government Area of Edo State, Nigeria, a study that was aimed at determining the prevalence of UTI, in the community, the effect of gender and age on its prevalence, and the etiologic agents and their susceptibility

profile was carried out. A total of 204 (39.69%) out of the 514 patients had UTI. The age range of 21 – 30 years old women had the highest prevalence of UTI by (44.67%). (Oladeinde, Omoregie, 2019).

Recent studies have shown that, there are still major gaps in the knowledge about UTI and many young women though unaware, are at high risk of UTI. Ignorance of hygiene, symptoms and risk factors may lead to unidentified cases of UTI and is likely to go on without medical intervention thus degenerating into serious urinary and genital tract complications (Oladeinde, Omoregie, 2019). This calls for an urgent need for educational talks periodically addressing these gaps. Therefore, this study aims to assess the level of knowledge of UTIs and identify the associated risk factors which predisposes pregnant women in the University of Benin Teaching Hospital, Benin City, Edo State, to the development of the infections.

1.2. Statement of the Problem.

This research intends to fill the gap in our understanding of this clinical problem of knowledge on UTI and its associated risk factors and how it affects pregnant women in UBTH. In a study carried out in a local Filipino community, level of knowledge of UTI and its risk factors played a role in the health behavioural practices of the women as certain factors affected these behaviours (Navarro, Tiongco, 2019). Researchers discovered that education of these women and high standard of living played a role in the positive health practices of these Filipino women. (Navarro, Tiongco, 2019). In another study carried out in Jos, Nigeria, it was discovered that there was poor level of knowledge, as well as high prevalence of UTI among these pregnant women (Mafuyai, Bongji, 2019). Urinary Tract Infections poses a serious threat to pregnant women and foetal health, therefore an increase in

knowledge of the infection among these women and identifying the various factors which predisposes them to the development of the infection is very crucial in preventing its occurrence. During gestation, there is an increased risk of developing UTI due to the numerous changes which the body undergoes such as the weakening of the immune system which may lead to increase susceptibility to these infections. Pregnant women are more likely to develop repeated or more severe infections, up to 1 in 10 pregnant women will develop asymptomatic UTI (Hackney, Daniels, 2021). This cannot be over emphasized as UTI in pregnancy may lead various complications associated with maternal and fetal health such as pre-term premature rupture of membrane (which may lead to premature delivery), low birth weight which contributes to poor health outcomes such as fetal and neonatal mortality and morbidity, inhibited growth and cognitive development and Noncommunicable disease later in life. Low birth weight infants are about 20 times more likely to die than heavier infants, intra uterine growth restriction (fetus do not grow to normal weight), hypertension and pre-eclampsia which is the new-onset or worsening of existing hypertension with proteinuria after 20 weeks gestation. This may result in fetal growth restriction or fetal death.

Low level of knowledge on UTI among pregnant plays a role in the increase of incidence and prevalence of the infection as good practices which could reduce the incidence of the infection would not be adhered to. Knowledge on the causes of UTI, effects of UTI, the signs and symptoms of UTI and methods of prevention among these pregnant women would help in decreasing the rate of incidence and prevalence of UTI. Therefore, the assessment of level of knowledge of UTIs and the identification of the associated risk factors of UTIs among pregnant women should be carried out so as to reduce the incidence and prevalence of the infection among these women in Nigeria and worldwide.

This research study, knowledge of Urinary Tract Infections and its associated risk factors among pregnant women in University of Benin Teaching Hospital, is narrowed down to pregnant women in the University of Benin Teaching Hospital, Benin City, Edo State.

1.2 Objectives of the Study.

The study aimed to assess the level of knowledge of Urinary Tract Infections and to identify the associated risk factors which predisposes pregnant women to this Infection in the University of Benin Teaching Hospital, Benin City, Edo State.

1. To assess the level of knowledge of Urinary Tract Infections among pregnant women in UBTH, Benin City, Edo State.
2. To identify the environmental factors associated with Urinary Tract Infections among pregnant women in UBTH, Benin City, Edo State.
3. To identify the health behavioural practices associated with Urinary Tract Infections among pregnant women in UBTH, Benin City, Edo State.

1.4 Research Questions

1. What is the level of knowledge of Urinary Tract Infections among pregnant women in UBTH?
2. What are the environmental factors that predisposes pregnant women in UBTH to Urinary Tract Infections?
3. What health behavioural practices predisposes pregnant women in UBTH to Urinary Tract Infections?

1.5 Hypothesis of the Study.

The research hypothesis was formulated

H1: There is no significant relationship between knowledge of UTI and the pregnant women in the University of Benin Teaching Hospital.

H2: There is no significant relationship between associated risk factors of UTI and the pregnant women in the University of Benin Teaching Hospital.

1.6 Significance of the Study.

Nigeria is the most populous nation in sub-Saharan Africa with MMR of 525 per 100,000 live births reported in 2013. Recent reports indicate that Nigeria is one of the six countries that account for 50% of global maternal deaths. A study in Enugu State Teaching Hospital reported an unacceptably high MMR of 840 per thousand live births (Ezugwu, Afunwa et. al. 2021).

The data acquired from this study will provide baseline information on the study which will be useful for the planning of awareness strategies and preventive measures for pregnant women at risk to develop the infection in Edo State and Nigeria at large thereby contributing to the institution, profession and the society. An awareness campaign to help pregnant women become knowledgeable about Urinary Tract Infection and its associated risk factors can be run based on this study, designing and implementation of educational programs to

increase the awareness and susceptibility about chances of developing the infection can be carried out, and educating the women on the causes of UTI by the healthcare professionals should be carried out.

This will help in the control of the incidence and prevalence of Urinary Tract Infections among pregnant women in UBTH and all over Nigeria and at large.

1.7 Scope of the Study.

The study is delimited to the knowledge of Urinary Tract Infections and its associated risk factors among pregnant women in University of Benin Teaching Hospital, Benin City, Edo State. This study is also delimited to the three stated research objectives, three research questions and two research hypotheses.

This research study is equally delimited to one selected tertiary hospital which is; University of Benin Teaching Hospital (UBTH) in Benin City, Edo State.

1.8 Operational Definition of Terms.

Knowledge: The information about UTIs that is known among pregnant women in UBTH.

Associated risk factors: The risk factors associated with UTIs among pregnant women in UBTH.

Urinary Tract Infection: This is an inflammation of part or complete tissues of the complete urinary tract.

Pregnant women: This refers to the young women who are carrying a developing offspring within the body to be studied in UBTH.

UTI: Urinary Tract Infections.

CHAPTER TWO

In this chapter, previous research studies carried out concerning Urinary tract infections in women will be examined and reviewed under the following headings: Conceptual framework, Empirical and Theoretical framework.

2.1 Conceptual Review

2.1.1 Overview of Urinary Tract Infections

Urinary Tract Infections occurs when there is an inflammation of any part of the tissues of the Urinary Tract which is caused by the presence of pathogenic microorganisms in the Urinary Tract. Urinary Tract Information is characterized by frequent and painful urination. Long term UTI results in problems such as kidney disease, sepsis (urosepsis), strictures and obstructions. (Brunner & Suddarth's Medical-Surgical Nursing, 14th edition). Signs and symptoms of UTI depend on the part of the Urinary tract that is infected, whether it is the lower part or the upper part of the urinary tract, and also whether the infection is acute or chronic. Signs and symptoms for a uncomplicated lower UTI include burning on urination, urinary frequency (voiding more than every 3 hours), urgency, nocturia (awakening at night to urinate), incontinence and pelvic pain. For complicated UTIs, manifestations ranges from

asymptomatic bacteriuria to gram negative sepsis with shock. (Brunner & Suddarth's Medical-Surgical Nursing, 14th edition). Effect of UTIs includes:

- Urethra: Burning sensation with urination discharge.
- Bladder: Pelvic pressure, lower belly discomfort, frequent and painful urination, blood in urine.
- Kidneys: Back or side pain, high fever, shaking and chills, nausea and vomiting.

Classification of UTIs

- UTIs are classified by location: The lower and upper urinary tract. The lower urinary tract includes the bladder and structures below the bladder, examples of lower tract UTIs includes cystitis, prostatitis, urethritis. The upper urinary tract includes the kidneys and the ureters, examples of upper tract UTIs includes acute pyelonephritis, chronic pyelonephritis, perirenal abscess.
- UTIs are also classified as uncomplicated and complicated UTIs:
  - Uncomplicated Lower or Upper UTIs: Community acquired infection, which is common in women. There are no relevant functional or anatomical abnormalities in the urinary tract, no relevant kidney function impairment, and no relevant concomitant diseases which increases the risks of developing serious complications. (Medina, et. al, 2019).
  - Complicated Lower or Upper UTIs: Acquired in hospital which is related to catheterization in patients with urologic abnormalities

2.1.2 Epidemiology

Urinary Tract Infections

Community acquired UTIs affects more than 150 million people in a year. Complicated UTIs in particular constitute a huge burden on healthcare systems as a frequent cause for hospitalization. The prevalence of Hospital acquired UTIs ranges from 1.4% to 5.1%, and the majority of them are as a result of catheterization (Ozturk, 2020). Over 404 million individuals had UTI globally and over 200, 000 people died of the disease which showed a globally rising trend of UTI burden between the year 1990 to 2019 (Chen, Cheng, et. al. 2019). These studies depict that over the years, UTIs are the most common outpatient infections, with an incidence of 50-60% in adult women worldwide (Medina, Castillo-Pino, 2019).

The prevalence of UTI in sub-Sahara Africa varies from one geographical location to another and from country to country. In Ghana, from the study, it was deduced that the prevalence rate of UTI is 15.9%, in Senegal 4.5% and 12.3% in Nigeria. Escherichia coli is the most predominant isolated uropathogen in most studies with 46.4%. (Mwangonde, Mchami, 2022). This study revealed that the total prevalence of UTI in sub-Saharan Africa is 32.12% with South Africa recording the highest prevalence of 67.6%, followed by Nigeria with a prevalence of 43.65% and Zambia with a prevalence of 38.25% (Mwangonde, Mchami, 2022). In Okada, a rural community in the Ovia North East Local Government Area of Edo State, Nigeria, a study that was aimed at determining the prevalence of UTI, in the community, the effect of gender and age on its prevalence, and the etiologic agents and their susceptibility profile was carried out. A total of 204 (39.69%) out of the 514 patients had UTI. The age range of 21 – 30 years old women had the highest prevalence of UTI by (44.67%). (Oladeinde, Omoregie, 2019). Although a lot of research on the epidemic of UTI in Nigeria have not been carried out, it is important to determine the actual burden of UTI to women in Nigeria to facilitate appropriate health resource allocation, advocacy and planning.

2.1.3 UTIs in Pregnant Women

UTI is one of the most seen medical complications of pregnancy and is a significant cause of maternal and fetal morbidities if left untreated (Ezugwu, Afunwa, 2021). Possible complications of UTIs in pregnancy include Renal dysfunction (usually transient but as many as 25% of pregnant women with pyelonephritis have a decreased glomerular filtration rate) (Platte, 2021). Septic shock though it is a rare occurrence, increased risk in pregnant women of delivering premature infant, pre-term labour and pre-eclampsia. It can be deduced from this that UTIs are closely associated with the adverse feto-maternal complications.

A study in Enugu metropolis carried out to determine the prevalence of UTI among pregnant women showed that out of 384 subjects' urine screened, 282 cases of UTI were diagnosed in the hospitals under study (Ezugwu, Afunwa, 2021). It was deduced that the UTI prevalence among pregnant women in Enugu metropolis was 73% of the 384 samples that were screened. This is very high compared to the prevalent rate from other states in the country such as Ebonyi which recorded 46.5%, Ilorin, North Central Nigeria recorded 35.5%, Kano, Northern Nigeria recorded 31.6% and Benin, Southern Nigeria with 32.7% recorded. According to other studies carried out, UTIs constitute the most common infections of pregnancy, diagnosed in as many as 50-60% of pregnant women (Czajkowski, 2021).

2.1.4 Pathophysiology of UTIs

Pathogen colonizes the periurethral area and ascends through the urethra upwards towards the bladder. Following penetration, bacteria continues to replicate and may form biofilms. Fimbria allow bladder epithelial cell attachment and penetration. Bacterial toxins may also play a role by inhibiting peristalsis (reducing the flow of urine), fimbria may aid in the

ascension process. The invasion of the bladder mucosal wall produces an inflammatory response which is cystitis (Bono, Leslie, Reygaert, 2022). The majority of organisms causimg the infection are enteric coliforms which typically inhabit the periurethral vaginal introitus. Once sufficient bacterial colonization occurs, they ascend on the ureter towards the kidney. While infection of the renal parenchyma is usually the result of bacterial ascension, it can also occur from hematogenous spread. Infection of the parenchyma causes an inflammatory response called pyelonephritis. This may lead to interstitial nephritis, causing acute kidney injury (AKI). The renal parenchyma is a critical component of kidney function and damages to this component can result in debilitating effects (HealthMatch staff, 2022). If the inflammatory cascade continues, tubular obstruction and damage occur, leading to interstitial edema.

A urinary tract infection causes the lining of the urinary tract to become red and irritated which may cause some of the following symptoms:

- Pain in the side, abdomen or pelvic area.
- Pressure in the lower pelvis.
- Urinary frequency, urgency and incontinence.
- Dysuria and haematuria.
- Need to urinate at night.
- Abnormal urine colour (cloudy urine) ad strong smelling urine.

2.1.5 Effect of UTIs in Pregnant Women

UTIs in pregnancy poses a danger to both the mother and the feotus. It associated with adverse outcomes such as low birth weight, preterm birth, still birth, preeclampsia, materal

anaemia, sepsis, and amnionitis (Getaneh, Dessie, Desta, 2021). Escherichia coli is the most common bacteria associated with UTIs, if symptomatic or asymptomatic bacteriuria is untreated, up to 30% of mothers develop acute pyelonephritis, with increased risk of multiple maternal and neonatal complications, such as preeclampsia, preterm birth, intrauterine growth restriction and low birth weight (Delkos, Kalinderis, Athanasiadis, 2018).

- **Low Birth Weight:** Low birth weight is defined by the World Health Organisation (WHO) as weight at birth of <2500 (5.5 pounds). Low birth weight contributes to poor health outcomes such as fetal and neonatal mortality and morbidity, inhibited growth and cognitive development and Noncommunicable disease later in life. Low birth weight infants are about 20 times more likely to die than heavier infants.
- **Preterm and still birth:** Preterm birth is the birth of an infant before gestation term, that is before 37 weeks of pregnancy have been completed. Preterm birth affected 1 out of every 10 infants born in the US. The rate of occurrence rose 4% in 2021, from 10.1 in 2020 to 10.5 in 2021. A stillbirth is the death or loss of a baby before or during delivery.
- **Preeclampsia**: Preeclampsia is the new-onset or worsening of existing hypertension with proteinuria after 20 weeks gestation. This may result in fetal growth restriction or fetal death. It is diagnosed by measuring blood pressure and urine protein and by tests to evaluate for end-organ damage such as pulmonary oedema, impaired liver or kidney function (Dulay, 2022).
- **Maternal Anaemia**: Much is known concerning the consequences of anaemia during pregnancy. This includes the increased risks of low birth weight, preterm birth, perinatal mortality, and neonatal mortality. It also place the mother at increased risk of death during and after childbirth.

- **Sepsis**: This is a condition where by the body responds to infection improperly which subsequently, leads to multiple organ failure if not treated properly, vital organs suffer low supply of blood (Mayoclinic, 2023). As sepsis worsens, it may lead to atypical blood clotting and the resulting small clots may damage or destroy tissues.
- **Amnionitis:** Amnionitis, also known as chorioamnionitis or intra-amniotic infection, is an infection of the uterus, the amniotic sac and sometimes the feotus. It is a rare occurrence, occurring about 2 to 5 percent of term delivery pregnancies. Although the uterus is a sterile environment, certain conditions such as UTIs makes the uterus susceptible to infections.
- **Intrauterine Growth Restriction:** This is when the fetal weight is estimated to be below the 10^{th} percentile for its gestational age. The causes range from chronic diseases or infections in the birthing parent to issues with the placenta and umbilical cord. Treatment includes frequent fetal monitoring and testing and possibly, early delivery.

2.1.6 Management of UTIs

Diagnosis

Due to the high prevalence of asymptomatic bacteriuria in pregnancy and the consequences, it is important to screen for the condition in pregnancy. UTIs are diagnosed by analyzing the urine sample by urinalysis and urine culture with antimicrobial susceptibility testing (Medical Encyclopedia, 2021). Various methods are used to screen for asymptomatic bacteriuria; among these are urinalysis to detect protein, white blood cells, red blood cells, urine dipsticks for nitrites and leukocyte esterase. Although these tests are easily available and rapid, they have relatively poor predictive values and false negatives results are common.

However, Urine culture remains the better standard for detecting bacteriuria in pregnancy. The limiting factor is the relative high cost and delay in results as it takes 24 to 48 hours to culture the organism.

- Urinalysis: This is the physical, chemical and microscopic tests on a sample of urine to find evidence of infection such as bacteria and white blood cells.
- Urine culture: This is the test that identifies a specific bacteria or yeast present in the urine sample which may be responsible for causing the infection as well as determining the best antibiotics to be used for treatment.
- Susceptibility testing: This test measures how sensitive the bacteria or fungi present in the urine sample to an antibiotic or antifungal drug. This helps to determine which drug is the most suitable.

Antibiotic Therapy

Oral antibiotics are the treatment of choice for asymptomatic bacteriuria and cystitis, usually, the treatment is initiated empirically before the results from culture and susceptibility tests are obtained (Platte, Kim, 2021). Antibiotics such as Nitrofurantoin monohydrate/macrocrystals 100 mg orally twice daily for 5-7 days, Amoxicillin 875 mg orally twice daily (alternative: 500 mg orally three times daily) for 5-7 days, Amoxicillin-clavulanate 500/125 mg orally three times daily for 5-7 days (alternative: 875/125 mg orally two times daily for 5-7 days), Cephalexin 500 mg orally four times daily for 5-7 days, Fosfomycin 3 g orally as a single dose with 100-188 mls of water are administered. In a severe case of complicated UTIs, the patient is admitted into the ward for close monitoring and antibiotics are administered intravenously. In a meta-analysis carried out, it was depicted that the above antibiotics were effective in terms of both increasing cure rates of UTI in

pregnancy and decreasing the incidence of associated adverse outcomes. (Platte, Kim, 2021). The success of treatment however depends on the eradication of the bacteria rather than the duration of therapy. One to two weeks after completion of therapy, urine culture should show negative findings.

In a case or recurrent UTI, for over three episodes, daily antibiotic prophylaxis should be commenced for the remainder of the pregnancy (Platte, Kim, 2021). Daily prophylaxis regimens include nitrofurantoin 100 mg nightly, or cephalexin 250-500 mg nightly. Antibiotic selection should be based on urine culture sensitivities, institution-specific drug resistances and maternal physiologic changes which may influence pharmacokinetics such as increased glomerular filtration rate and renal plasma flow, increased volume of distribution, decreased gastric motility and emptying and decreased albumin levels (Platte, Kim, 2021). Serum levels of antibiotics are usually lower during pregnancies due to the gross increase in blood volume and increased glomerular filtration rate. Antibiotics such as tetracyclines, aminoglycosides, fluoroquinolones, trimethoprim-sulfamethoxazole should not be used during pregnancy due to side effects on fetal teeth and bones, ototoxicity following prolonged fetal exposure, toxicity to developing cartilage. Nitrofurantoin and Trimethoprim-sulfamethoxazole should be avoided during first and second trimester (Platte, Kim, 2021).

Surgical Treatment

In a case where by surgical intervention is indicated, the surgery should be planned for the second trimester as carrying out an invasive procedure during the first trimester is usually associated with increased risk of miscarriage; operating in the third trimester is associated with increased risk of preterm labour. In a case where urgent surgical intervention is required in the third trimester, it should coincide with the delivery of the foetus (Platter, Kim, 2021).

Rarely indicated invasive procedures which may be required includes the following:

- Cystoscopy which may aid in the establishment of the diagnosis of the urethral or bladder diverticulum, bladder stones, urethral syndrome, lower urinary tract trauma, interstitial cystitis, or bladder cancer.
- A retrograde stent or a percutaneous nephrostomy tube should be placed to relieve ureteral colic or decompress an obstructed infected collecting system.
- Ureteroscopy stone extraction.

2.2 Theoretical Framework

This is based on Health Belief Model

The Health Belief Model (HBM) was developed in the early 1950s by social scientists at the U.S. Public Health Service in order to understand the failure of people to adopt disease prevention strategies or screening tests for the early detection of disease. Later uses of HBM were for patients' responses to symptoms and compliance with treatments. The HBM suggests that a person's belief in a personal threat of an illness or disease together with a person's belief in the effectiveness of the recommended health behaviour or action will predict the likelihood that the person will adopt the behaviour. The HBM derives from psychological and behavioural theory with the foundation that the two components of health related behaviour are;

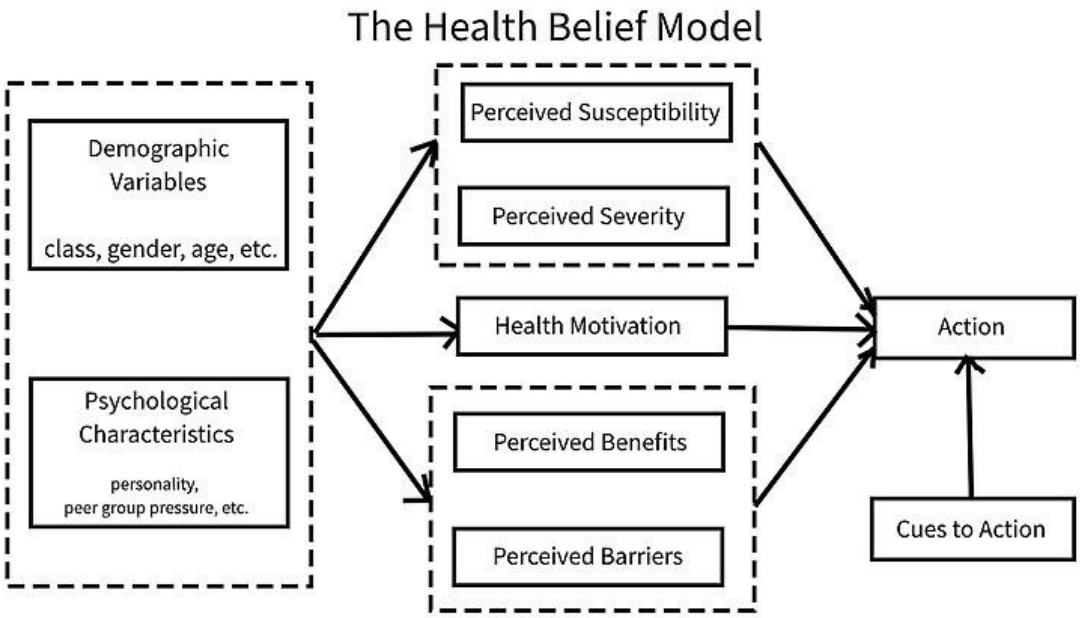
1. The desire to avoid illness or conversely get well if already ill
2. The belief that a specific health action will prevent, or cure, illness.

Ultimately, an individual's course of action often depends on the person's perceptions of the benefits and barriers related to health behaviour. The Health Belief Model (HBM) is one of

the most widely used conceptual frameworks for understanding health behaviour. Developed in early 1950s, the model has been used with great success for almost half a century to promote greater use of condom, seat belt use, medical compliance and health screening use and so on. The HBM is based on the understanding that a person will take a health arelated action if that person:

1. Feels that a negative health condition can be avoided.
2. Has a positive expectation that by taking a recommended action, he/she will avoid a negative health condition.
3. Believes that he/she can successfully take a recommended health action.

The Health Belief Model is a framework for motivating people to take positive health actions that uses the desire to avoid a negative health consequence as the prime motivation. For example, HIV is a negative health consequence, and the desire to avoid HIV can be used to motivate a sexually active person into engaging in safe sex. Another example, UTI is a negative health consequence, therefore, the desire to avoid UTIs can be used to motivate pregnant women to engage in safe health practices. Avoiding a negative health consequence is a key element of the HBM.



Perceived severity: Perceived severity refers to the subjective assessment of the severity of a health problem and its potential consequences (Glanz, Karen, Bishop, Donald 2010). The health belief model proposes that individuals who perceive a given health problem as serious are more likely to engage in behaviours to prevent the health problem from occurring or reduce its severity. For instance, an individual may perceive malaria to be not serious, but if he or she perceives that there may be serious financial loss as a result of being absent from work for several days, then he or she may perceive malaria as a serious condition.

Perceived susceptibility: Perceived susceptibility refers to subjective assessment of risk of developing a health problem (Glanz et al 2010). The health belief model predicts that individuals who perceive that they are susceptible to particular health problem will engage in behaviours to reduce the risk of developing the health problem (Christopher, 2010). The combination of perceived severity and perceived susceptibility is referred to as perceived threat (Glanz et al 2010). Perceived severity and perceived susceptibility to a given health condition depends on knowledge about the condition (Christopher, 2010). The health belief

model predicts that higher perceived threats leads to higher engagement in health promoting behaviours.

Perceived benefits: Health related behaviours are also influenced by the perceived benefits of taking action (Glanz et al 2010). Perceived benefits refer to an individual's assessment of the value of efficacy of engaging in a health promoting behaviour to decrease risk of the disease (Siddiqui et al 2016). If an individual believes that a particular action will reduce susceptibility to a health problem or decrease its seriousness, then he/she is likely to engage in that behaviour regardless of objective facts regarding the effectiveness of the action (Christopher, 2010). For example, individuals who believe that the wearing of sunscreen helps in the prevention of skin cancer are more likely to wear sunscreen than those individuals who do not believe that wearing sunscreen prevents cancer.

Perceived barriers: Health related behaviour are also a function of perceived barriers to taking action (Glanz et al 2010). Perceived barriers refers to an individual's assessment of the obstacles to behavioural change. Even if an individual perceives a health condition as threatening and believes that a particular action effectively reduce the threat, barriers may prevent engagement in the health promoting behaviour. In other words, the perceived benefit must outweigh the perceived barriers in order for behaviour change to occur (Glanz et al 2010). Perceived barriers to taking action may include the perceived inconvenience, expense, danger (e.g., side effects of a medical procedure) and discomfort (e.g., pain, emotional upset) involved in engaging in the behaviour (Christopher, 2010). For instance, lack of access to affordable health care and the perception that a flu vaccine shot will cause significant pain may act as barriers to receiving the flu vaccine. The heath belief model suggests that modifying variables affect health related behaviours indirectly by affecting perceived seriousness, susceptibility, benefits and barriers (Christopher 2010).

Cues to action: The health belief model posits that a cue, or trigger, is necessary for prompting engagement in health prompting behaviour (Christopher, 2010). Cues to action can be internal or external. Physiological cues such as pain and symptoms are examples of internal cues. External cues includes events or information from close others, the media, or health care providers promoting engagement in health related behaviours. Examples of cues to action include a reminder postcard from a dentist, the illness of a friend or a family member, and product health warning labels. The intensity of cues needed to prompt action varies between individuals by perceived susceptibility, seriousness, benefits, and barriers (Christopher 2010). For example, individuals who have reliable access to health care may be easily persuaded to get screened for the illness after seeing a public service announcement, whereas individuals who believe they are at low risk for the same illness and do not have a reliable access to health care may require more intense external cues in order to get screened.

Self-efficacy: Self efficacy was added to the four components of health belief model (perceived susceptibility, seriousness, benefits and barriers) in 1988 (Glanz et al 2010). Self-efficacy refers to an individual's perception of his or her competence to successfully perform a behaviour. Self-efficacy was added to the health belief model in an attempt to better explain individual differences in health behaviours. The model was originally developed in order to explain engagement in one-time health behaviours such as being screened for cancer or receiving an immunization (Christopher 2010). Eventually, the health model was applied to more substantial, long-term behaviour change such as diet modification, exercise and smoking. Developers of the model recognized that confidence in one's ability to effect change in outcomes was a key component of health behaviour change (Glanz et al 2010).

APPLICATIONS TO THE STUDY

The health belief model has been used to develop effective interventions to change health related behaviours by targeting various aspects of the model's key construct (Christopher 2010).

Perceived severity: UTIs may pose some serious medical complications that may threaten the health of the mother and child, these complications can be avoided if the associated risk factors of UTI in pregnant women are identified. Also, the lack of knowledge of UTIs and the complications amongst pregnant women may lead to the development of the infection and its complications as a result of non-compliance to treatment regimen and safety measures.

Perceived susceptibility: Here, pregnant women who have the knowledge of the associated risk factors, effects and complications of UTIs engage in positive practices such as preventive measures and early treatment of the disease are likely to not develop the complications.

Perceived benefits: According to this study, women's awareness towards their health is determined by the benefit they get from engaging in the practices. If compliance to their therapeutic regimen put them at the peak of their health then the rate of compliance is highly understood.

Perceived barrier: As indicated in this study, various factors that could affect compliance were stated and some respondents concurred that some of those factors influenced their knowledge towards their health compliancy. Barriers are obstacles that promote negative behaviours towards their health and this should be dealt with and reduced the minimal level.

2.3 Empirical Review of Related Literatures

2.3.1 Knowledge of Urinary Tract Infections among pregnant women.

El-bana, Ali et., al. (2020). Urinary tract infection is one of the most prevalent disorders during pregnancy. Several physiological and hormonal changes occur, which increase the

incidence of infection among pregnant women. It can be symptomatic or asymptomatic (Ahmed & Khresheh, 2016). It is the most common complication of pregnancy. It occurs in around 5 to 10% of all pregnancies (Jalali et al., 2014). Educating pregnant women about urinary tract infections and preventive measures helps to prevent the development of a complication. This study aimed to evaluate the effect of an educational intervention on pregnant women's knowledge and self-care practices regarding urinary tract infection. The aim of the present study was achieved through the present study findings. The pregnant women's knowledge and self-care practices regarding urinary tract infection were statistically improved post-intervention compared to their preintervention level, supporting the research's current hypothesis. The present study discloses that more than half of the sample were in the age group of 20-<30 years old, and the highest percentage of them had secondary education (near two-thirds). This finding might be due to our cultural tradition of early marriage. These results agree with a study by Ahmed and Khresheh (2016), who stated that half of the sample ages' were from 20-<30 years old with a mean age of 29.8±9.89 and more than half of them had secondary education. Additionally, these results agree with Jalali et al. (2014), who reported that about half the sample was between the age group of 22-25 years, and the mean age was 23.5 years. On the other hand, these results contrast with Al-Kotb et al. (2016), as urinary tract infections have been reported to be more frequent in older women and of lower socioeconomic status. From the researcher's perspective, this difference may be due to different geographical locations and populations included in the study.

The present study's findings revealed a statistically positive correlation between total knowledge and self practices score before and after the intervention. This result may be due to the improvement of knowledge owing to improved practice. These findings are in congruence with Grigoryan et al. (2014). They clarified a positive, highly statistically significant correlation between total knowledge and total practice scores and total knowledge

and total intention to practice healthy behavior. Additionally, Yossif and EL Sayed (2014) stated that most people require a certain degree of knowledge to practice competently. There is also the assumption that this level of knowledge is directly related to practicing safe and effective care. These findings are supporting the current research hypothesis. Therefore, this research found that there was a lack of women's knowledge of UTI during pregnancy. They have also lacked the concept of self-care practice as well as basic health practices. However, it is essential to increase understanding of UTIs and improve prevention and recovery programs for pregnant women and health education to learn about self-care practices during pregnancy.

Nwachukwu, Onyebuchi, et., al. (2018). The prevalence of urinary tract infections (UTIs) among pregnant women receiving antenatal care at Kanayo specialist hospital and General hospital both in Onitsha was considered to be high. Out of 200 urine samples of the pregnant women, 112(56%) showed growth of pathogenic bacteria which is similar to the findings but contradicts the findings. In our study the highest prevalence of UTI is seen in primigravidty (45%) and the lowest prevalence of UTI is seen in multigravidty (20%) which contradicts the findings of that have the highest prevalence of UTI among the multigravida as a result of pressure effect of a bigger uterus on the ureter and pressure on the bladder from the descending part leading to stasis of urine and the increased multiplication of urine. This study shows that pregnant women within the age of 26-30 years had more infections than women within the age of 20-25 years and it may be as a result of sexually activity which increases the risk of UTI and the women of such age group are mostly sexually active. This report is also similar to that who also found that prevalence of UTI increases in sexually active women within the same age group. This study shows that the most common bacteria isolated from the mid stream urine samples of pregnant women was *Escherichia coli* which is similar to the

separate findings. The prevalence of urinary tract infections during pregnancy is very high (56%). All pregnant women should be screened for UTI with a urine culture. Early diagnosis and treatment of UTI during pregnancy can ensure the safety of the mother and the feotus. It also prevents complications during child delivery.

Okwu, Stanley, et., al. (2021). Asymptomatic bacteriuria is bacteria in the properly collected urine of a patient, leading to a urinary tract infection with no symptoms. Asymptomatic bacteriuria is a common complication in clinical practice with an increasing prevalence due to increase of age. The present study investigated the prevalence of asymptomatic bacteriuria among pregnant women receiving antenatal care in Ovia North East Local Government Area, Edo State, Nigeria. A total of 201 urine samples were collected randomly from pregnant women at Igbinedion University Teaching Hospital, Okha Maternity and Usen General Hospital in in Ovia North East Local Government Area. The bacteria isolation was carried out using the pour plate technique. The bacteria identification was conducted by gram staining and biochemical tests and the antibiotic susceptibility pattern of the bacterial isolates was determined by Kirby-Bauer disc diffusion technique. Eighty-one of the subjects had significant bacteriuria, with a prevalence of 40.3 %. The bacteria isolated in the samples were Streptococcus, Proteus, Klebsiella and Micrococcus species as well as Staphylococcus epidermidis, Escherichia coli and Staphylococcus aureus. Streptococcus spp. occurred more frequently (42.0 %) while S. aureus had the lowest frequency of occurrence (2.5 %) in the samples. The infection was most prevalent among women aged between 28 and 37 years (74.5 %). Pregnant women in their third trimester in this study had the highest prevalence of asymptomatic bacteriuria (55.2 %). Ciprofloxacin was found to be the most effective antibiotic against the urinary isolates. Pregnancy promotes the progression from symptomatic to asymptomatic bacteriuria with its consequences such as pyelonephritis and

increased fetal mortality. Therefore, routine culture test should be carried out for all antenatal women to detect asymptomatic bacteriuria and all positive cases should be treated with appropriate antibiotic therapy to prevent any obstetric complications which are associated with pregnancy.

2.3.2 Environmental factors and health behavioural practices associated with UTI among pregnant women.

Onyango, Ngugi, et., al. (2018). In this study, the overall prevalence of urinary tract infection in pregnant women in this study was 15.7% regardless of the women's age, parity and gestation. This falls within the global prevalence range of 13% - 33% and is comparable to the prevalence reported in Tanzania 15.5%, but higher than those in studies from Ethiopia (10.4%) and Uganda (13.3%). This was however lower than the prevalence of 31.3% reported in Egypt. Variations in prevalence rates from one country to another and among different regions of the continent can be attributed to environmental, economic and social habits of a community. In this study, knowledge of UTIs among the pregnant mothers was very low (37.6%) and only 9%, could link UTI acquisition to poor urogenital hygiene which was found to be a strongest predictor of these infections. This may partially fuel the high prevalence because fewer women seek treatment in time leading to poor treatment outcomes especially in well-established infections. There was no significant association between UTI and maternal age, parity, occupation, stage of gestation, marital status or level of education making it comparable to other studies. However, maternal age and parity have previously been identified as risk factors for UTI among pregnant women.

Published studies indicates that simple hygiene habits such as voiding before and after sexual intercourse, use of absorbent cotton undergarments and wiping from anterior to posterior are

advocated to decrease the risk of UTI. Material of the undergarment and frequency of changing the undergarments were also found to be significantly contributing to the occurrence of UTI ($P < 0.05$), similar to a past study conducted in Egypt. There is a possibility that the moisture trapped by non-cotton undergarments favour the proliferation of UTI agents including yeast hence increasing the chances of UTI. Results from this study were in concordance with those from other studies that have reported that majority of the mothers who suffered UTI are in the second trimester. According to published studies, the risk of UTI begin at the 6^{th} week and the peak is usually around weeks 22 to 24 of gestation. The high prevalence of UTI in the second trimester can partially be attributed to the rapid changes in the physiology and immunology of pregnant women and due to the frequency of UTI tests during this phase.

From the foregoing, it is clear that treatment-seeking behaviour and knowledge of UTI may play a critical role as drivers for acquisition of UTI. Having multiple sexual partners and frequency of sexual intercourse (≥2 times/ week) had moderate association to UTI occurrence similar to findings from a study conducted in Egypt. In general, UTI are not considered as sexually transmitted infections (STIs) but this data suggest that males may be an important factor in the spread of UTIs between partners. Since males are normally asymptomatic for UTI, there is a need to include both sexual partners for UTI diagnosis and treatment especially during pregnancy. In the face of increasing prevalence, there is a need to devise infection prevention and control methods that can reduce the incidences of UTI. Such measures will also include educating these women on predisposing and risk factors for UTI.

In a research, 48 studies were carried out in 12 African countries involving 15,664 pregnant women from 3393 obtained studies, the aim of the study was to estimate the prevalence of UTI in pregnant women. This study revealed that there was a prevalence of 33.4% among

pregnant women in Africa with the causative organism being Escherichia coli bacterial (Awoke, Tekalign et. al. 2021).

Ali, Abdallah, et., al. (2019). In the present study, a total of 145 cases were considered of which 23 cases accounted for 15.8% were UTI positive while 122 cases (84.2%) were UTI negative. The overall prevalence of urinary tract infection among pregnant women complaining of lower abdominal pains in this study was found to be 15.8%. This result was in conformity with similar study conducted by Mikhail et al. (2019) in Northern Tanzania who found the prevalence of UTI among pregnant women as 16.4%. Another study conducted by Muhammad et al. (2018) found 14.6% as the percentage prevalence of pregnant women with Urinary tract infection. The result also correlates with that found in Khartoum, Sudan (14%). On the other hand, the result of the present study is in contrast with that of Nabbugodi et al. (2018) who found prevalence of UTI among pregnant women as 26.7%. The differences in prevalence may be explained due to differences in socio-economic status, environmental condition, social habit, personal hygiene and educational level. Prevalence of UTI among pregnant women showed that higher incidence found among subjects of age category 26 – 30 years. However, the result is not significant. This finding was in conformity with that of Nwachukwu et al. (2015) who study the prevalence of urinary tract infections in pregnant women in Onitsha Nigeria who found similar result. Higher incidence among pregnant women in this category may be as result of higher sexual activity and women at this stage more sexually active which in turn increase the risk of UTI.

On the basis of socio-economic status, most of the UTI patients were unemployed. Unemployment is associated with low standard of living and poverty which promote infectious diseases. Rural dwellers occupy large percentage of UTI patients among the study subjects but there is no statistical differences at $p<0.05$. There is poor environmental

sanitation and housing conditions in rural area and most of rural dwellers showed low personal hygiene which may increase the risk of urinary tract infection. This result supported the finding of Nworie et al. (2019) who found poor personal hygiene and bad housing condition among the factors causing high prevalence of UTI among rural dwellers. The educational level of the subject showed higher prevalence among subjects without formal education. According to this study, highest incidence of UTI is seen in 3rd trimester, followed by 2nd trimester and least is seen in 1st semester. This result supported that of Ranjan et al. (2017) who found higher incidence among subjects in 3rd trimester. According to them, the increased incidence during third trimester may relate to increased mechanical obstruction due to gravid uterus. Secondly, most of the pregnant women in the study area come for ante-natal care during second or third trimester.

Adewuyi G.M., Ekoziem et., al. (2018). Prevalence of Chlamydial trachomatis UTI among pregnant women attending Antenatal care clinic in Irrua specialist Teaching Hospital, Irrua is 8.1%. This is low compared to prevalence of C. trachomatis infection among women in other studies in various locations in Nigeria. A.C. Ikeme et a found a prevalence of 29.1% in Enugu among women attending gynaecological clinic for secondary infertility, PID and STD; while Mawak J.D. got a prevalence of 56.1% in Jos among Gynaecological clinic attendees. A prevalence of 30.2% was seen among female University students in Port Harcourt by AUH Arinze et al. The relatively low prevalence value in this study can be explained by the differences in the type of specimen and studied populations. While most studies used endocervical swab or blood as the specimen, this study used patient's urine. The pathogen, Chlamydia trachomatis has preference for endocervix and can be harvested more with endocervical swabs than from the urine. The Jos and Enugu studies were among patients with gynaecological problems of infertility, PID and STI which can be caused by Chlamydial

trachomatis, hence the high prevalence among this population. Similarly, high prevalence value among the undergraduates in Port Harcourt is not surprising since most of them are not married and they have multiple sexual partners: risk factors for chlamydia trachomatis infections. However, the prevalence in this study is similar to 13.2% found in Ile-Ife by T.O. Okunola among similar population in the antenatal clinic. The prevalence of Chlamydial trachomatis infection was higher among the singles than the married and it is statistically significant. This similar to findings in literatures and other studies. Women in the second trimester also had higher prevalence than those in first and third trimesters. However, there is no statistically significant association between gestational age and occurrence of Chlamydial trachomatis infection. Sexual activity in pregnancy is not a risk factor to chlamydial infections, hence it should not be discouraged among pregnant women. The parity of a woman has no significant association with risk of chlamydial trachomatis infection as the transmission of the diseases has nothing to do with parturition. Other risk factors for the infection in this study are: presence of UTI symptoms, multiple sexual partners and previous STI. These risk factors are identical to the findings of other researchers in Nigeria and abroad. Chlamydia trachomatis is one the commonest cause of STI and it is commoner among young women with multiple sexual partners.

2.4 Summary of Literature review

UTI in pregnancy leads to severe complications for both mother and child. It is imperative that pregnant women are screened for this infection on visits to the clinic. Also, knowledge on UTI, the causes, effects, signs and symptoms cannot be over emphasized as this decreases the incidence and prevalence of the infection among these women. Identifying the risk factors aids in facilitating preventive measures. Pregnant women should be educated on UTI and its complications in order to boost positive health practices among them.

CHAPTER THREE

RESEARCH METHODOLOGY

This section describes the methods and procedures that was used in this study. It is discussed under the following headings; research design, research setting, target population, sample size, sampling technique, instrument for data collection, validity/reliability of the instrument, method of data collection, method of data analysis and ethical consideration.

3.2 Research Design

The descriptive non-experimental research design was adopted for the study because it helped the researcher get adequate information regarding the research problem.

3.3 Research Setting

This study was carried out among pregnant women in the University of Benin Teaching Hospital, Benin City, Edo State. Geographically, the selected hospital, University of Benin Teaching Hospital (UBTH), is a healthcare institution founded in 1973. It is located along Lagos-Benin Road, next to the federal University of Benin, Benin City, Edo State. The hospital currently provides healthcare, teaching and research services and it comprises of various departments, some of which are medical unit, surgical unit, outpatient unit, nursing service department, pharmaceutical department, laboratory unit, x-ray department, catering department, recreational therapy department, special unit, etc. It also has schools of learning which are; School of Nursing, School of Midwifery, School of Post Basic Nursing, School of Information and Health Technology Management, etc.

3.4 Target Population

The target population for this study consists of 250 pregnant women who visits the Ante-Natal unit at the University of Benin Teaching Hospital (UBTH) Edo State.

3.5 Sample Size

The sampling size is the number of subjects or participants required and to which the study findings will be generalized.

The size was estimated from a population of respondents using Taro Yamane (1967) formula.

$$n= \frac{N}{1+Nd2}$$

Where n= sample

N= population size

D= level of precision (confidence interval)

N= 250

D= 0.05

Thus;

$$N= \frac{250}{1 +250 (0.05)^2}$$

$$\frac{250}{1 + 250 (0.0025)}$$

$$\frac{250}{1 + 0.625}$$

$$\frac{250}{1.625}$$

Therefore n = 154

10% attrition = 15

Therefore, the minimum sample size is 169

3.6 Sampling Technique

The researcher used convenient sampling technique in selecting the respondents. Convenient sampling technique is a non-probability method in which the researcher is at will to choose the most conveniently available subjects as sample for the study, that is, according to who is available in no particular order. The researcher chose this method because the expectant mothers are not always available at the same time as it is an outpatient clinic, therefore the instruments were conveniently distributed to the available women.

3.7 Instrument for Data Collection

Structured questionnaire is the instrument that was used for data collection for this study. The items are constructed in a closed-ended form where the respondents will have to tick appropriately the option that suits their best knowledge. The questionnaire is divided into section A, B, C and D to address the research questions under investigation. Section A which is the demographic information of the respondents, section B the knowledge level of UTIs, section C the environmental factors associated with UTI and section D health behavioural practices associated with UTI are the research questions raised to guide the study.

Section A: The first section will ask questions on respondents' socio-demographic data and other background information.

Section B: Second section will elicit information on the level of knowledge of UTI.

Section C: The third section will elicit information on the nature of the living environment of the respondents.

Section D: The fourth section will identity the health behavioural practices associated with UTI.

3.8 Validity of Instruments

Validity refers to the degree to which a research instrument measures what it intends to measure (Polit & Beck, 2008). The questionnaire adopted is properly organized, structured and simplified by the researcher under the guidance of the supervisor and other local experts for distribution.

3.9 Reliability of Instruments

Reliability refers to the degree to which assessment tool produces stable and consistent result (Colin & Julie 2006). According to Polit and Beck (2008), the reliability of a measuring tool can be assessed in various ways. A reliable instrument is one that can produce the same results if behaviour is measured again by the same scale (Colin & Julie, 2006).

A pilot study was carried out using split-half method to test the reliability of the questions by administering the same questionnaire within the same study population at the Ante-Natal unit. The data was collected and analyzed using a Person Product Moment Correlation (PPMCC).

3.10 Method of Data Collection

A letter of identification was taken to UBTH and data was collected through the administration of well-structured questionnaires to the respondents (pregnant women attending the ante-natal clinic at UBTH) after oral consent was taken. The pregnant women were assisted in areas not understood and questionnaires were collected/retrieved immediately to ensure high percentage of return. Also, the respondents were supervised to ensure they supply independent responses as participants are guided on how to answer the questions.

3.11 Method of Data Analysis

This study employed descriptive statistics such as mean, standard deviation, frequency and percentage distribution, while Chi-square inferential analysis was used to test the research hypotheses with the aid of the statistics Package for Social Science (SPSS) version 24.0 for windows with the level of significance set at $p<0.05$.

3.12 Ethical Consideration

A letter of ethical approval from the Health Research Ethics, University of Benin Teaching Hospital was gotten by the researcher. The purpose of the study was explained to the participants. Participants choices were respected, as well as confidentiality of information divulged and anonymity maintained throughout the study.

CHAPTER FOUR

RESULTS

This chapter presents the data analysis of data and interpretation of results. The analysis is based on two hundred and thirty responses obtained from the semi-structured questionnaires administered to (230) patients who attended outpatient ante-natal clinic at the University of Benin Teaching Hospital (UBTH), Edo State. Results were analysed using descriptive statistics (frequency distribution tables, percentages).

4.2 Sociodemographic Characteristics of Respondents

Table 4.1: Socio-demographic characteristics of respondents

n=230 respondents

Variables	Attributes	Frequency	Percentage
Age	18-20	15	6.5
(years)	21-35	125	54.3
	36-39	69	30.0
	40-above	21	9.2
Marital Status	Married	189	87.6
	Single	41	12.4
Educational status	No formal	3	1.18
	Primary	36	14.20
	Secondary	134	62.20
	Tertiary	57	22.44
Ethnicity	Bini	95	61.02
	Esan	47	5.51

	Hausa	1	0.43
	Igbo	18	7.09
	Yoruba	4	1.43
Employment Status	Employed	19	7.48
	Unemployed	26	10.24
	Self employed	192	82.28
Religion	Christian	214	98.03
	Muslim	16	1.97
	others	0	0

n=230 respondents

The table above showed socio-demographic characteristics of respondents. Respondents age reveal that 15 (6.5%) of the respondents ranges from 18-20. 125 (54.3%) of the respondents are within 21-35 years, 69 (30.0%) of the respondents are within the range of 36-39 years of age and the last 21 (9.2%) are from 40 and above years of age. The marital status of the respondents showed 189 (87.6%) were single, while 41 (12.4%) were married. 214 (98.03%) of the respondents are Christians while 16 (1.97%) were muslims. The educational status shows that 3 (1.18%) had no formal education, 36 (14.20%) had primary education, 134 (62.20%) had secondary education while 57 (22.44%) had tertiary education. Only 1 (0.43%) were Hausa, 47 (26.51%) were Esan, 18 (7.09%) were igbo and 4 (1.43%) were Yoruba. 19 (7.48%) were employed, 26 (10.24%) were unemployed and 192 (82.28%) were self employed.

4.3 Knowledge of UTI among pregnant women

Table 4.2: Knowledge of UTI among pregnant women

	(N=230)	
	Frequency	**Percentage**
Do you about Urinary Tract Infections?		
Yes	220	95.7
No	10	4.3
A person develops UTI through which of the following?		
Failure to urinate after sexual activity	16	7.1
Poor personal hygiene	119	52.9
Eating too much	26	11.6
Wearing tight underwear	64	28.4
Which are the signs and symptoms associated UTI?		
Burning sensation when you pass urine	62	27
Urge to urinate more frequently than usual	66	28.7
Inability to hold urine before reaching the toilet	42	18.3
Feeling like your bladder is full	35	15.2
Pain in the lower abdomen	6	2.6
Don't Know	19	8.3
Do you know that taking fluids that irritate the bladder such as alcohol aids in UTI?		
Yes	209	90.9
No	18	7.8
Don't know	3	1.3
Which of these are effects of UTI on pregnancies?		

Low birth weight	185	80.4
Preeclampsia	2	0.9
Maternal anaemia	7	3
Stillbirth	27	11.7
Others	4	1.7
Don't know	5	2.2
Treatment of UTI includes?		
Tests	5	2.2
Diet	51	22.2
Medicine	131	57.0
Lifestyle modifications	38	16.5
Don't know	5	2.2

The space above shows respondents knowledge of UTI. It was reported by majority 220 (95.7%) that they were aware of UTI, while 10 (4.3%) were unaware. It was reported by majority 119 (52.9%) that a person develops UTI through poor personal hygiene, failure to urinate after sexual activity 16 (7.1%), eating too much 26 (11.6%), wearing tight underwear was reported by 64 (28.4%). It was reported by majority 209 (90.9%) that taking fluids that irritate the bladder such as alcohol aids in UTI, 18 (7.8%) reported that taking fluids that irritate the bladder such as alcohol do not aid in UTI while 3 (1.3%) reported that they did not know. It was reported by majority 185 (80.4%) that effects of UTI on pregnancies is low weight babies, 2 (0.9%) reported that preeclampsia is an effect of UTI, maternal anaemia was reported as an effect of UTI by 7 (3%), stillbirth was reported as an effect by 27 (11.7%). It was reported by the majority 131 (57%) that treatment of UTI is by medicine, 51 (22.2%) believed it is with diet, 5 (2.2%) believed treatment was by tests, 38 (16.5%) believed lifestyle modifications are treatments of UTI. Majority 66 (28.7%) reported the signs and

symptoms of UTI as the urge to urinate more frequently than usual, inability to hold urine before reaching the toilet was reported by 42 (18.3%), burning sensation when you pass urine was reported by 62 (27%), feeling like your bladder is full 35 (15.2%), and pain in the lower abdomen was reported by 6 (2.6%), 19 (8.3%) reported to not know.

4.4 Level of Knowledge of UTI

Table 4.3: Level of knowledge of UTI

n=230 respondents

	Frequency	**Percentage**
Poor (0-49.9%)	66	28.7
Fair (50-69.9%)	122	53.0
Good (70-100%)	42	18.3

Table 4.3 shows the level of knowledge of UTI. Sixty six (28.7%) of the respondents have poor knowledge, 122(53.0%) have fair knowledge, while 42(18.3%) have good knowledge on UTI.

4.5 Environmental factors associated with UTI

Table 4.4: Environmental factors associated with UTI

n=230 respondents

		SD	D	A	SA	$\bar{x}$	Remark
1	Accessibility to quality health care is usually affordable	66(28.7)	80(34.8)	46(20.0)	38(16.5)	2.24	Factor
2	Materials to carry out good personal hygiene like taking frequent baths, putting on clean clothes and under wears are easily accessible.	48(20.9)	94(40.9)	70(30.4)	18(7.8)	2.25	Factor
3	Area of residence is located in rural areas	27(11.7)	33(14.3)	124(53.9)	46(20.0)	2.82	Not a Factor
4	The kind of toilet available for use is usually pit latrine	51(22.2)	88(38.3)	66(28.7)	25(10.9)	2.28	Factor
5	Living environment is usually not well sanitized and comfortable	45(19.6)	65(28.3)	84(36.5)	36(15.7)	2.48	Factor
	Overall					**2.35**	**Factor**

Factor = Mean score <2.50

The table above showed environmental factors associated with UTI. The table indicates that in all the items assessing environmental factors associated with UTI, only items 4 gave a mean score indicating not a factor. The other items showed they are environmental factors associated with UTI. The overall mean also indicates that they are environmental factors.

Majority 80(34.8%) disagreed that accessibility to quality health care is usually affordable, only 66(28.7%) strongly disagreed, however 46(20.0%) agreed and 38(16.5%) strongly agreed, this item gave a mean score, indicating that it is a factor. 94(40.9%) disagreed that materials to carry out good personal hygiene like taking frequent baths, putting on clean clothes and under wears are easily accessible, only 48(20.9%) strongly disagreed, however 70(30.4%) agreed and 18(7.8%) strongly agreed, this item gave a mean score, indicating that it is a factor. Majority 124(53.9%) agreed that their area of residence is located in rural areas, only 46(20.0%) strongly agreed, however 33(14.3%) disagreed and 27(11.7%) strongly agreed, this item did not give a mean score, indicating that it is not a factor. Majority 88(38.8%) disagreed that the kind of toilet available for use is usually pit latrine, only 51(22.2%) strongly disagreed, however 66(28.7%) agreed and 25(10.9%) strongly agreed, this item gave a mean score, indicating that it is a factor. Majority 84(36.5%) agreed that their living environment is usually not well sanitized and comfortable, only 65(28.3%) disagreed, however 45(19.6%) strongly disagreed and 36(15.7%) strongly agreed, this item gave a mean score, indicating that it is a factor.

CHAPTER FIVE

DISCUSSION OF FINDINGS, CONCLUSION, SUMMARY AND RECOMMENDATION

This chapter entails the discussion of findings, implication for nursing, summary, conclusion, recommendation and suggestion for further studies.

5.2 Discussion of Findings

This research work was carried out to assess the knowledge of UTI and associated risk factors among pregnant women in University of Benin Teaching Hospital, Benin City, Edo State. In the course of carrying out this study, two research questions were raised. Two hundred and thirty (230) respondents were involved in this study, and data on the social demographic factors of the respondents, knowledge of UTI and associated risk factors of UTI were assessed using a structured questionnaire that was designed by the researcher.

Findings from this study showed that a high percentage of (45.3%) the study sample were in the age group of (21-35 years), while the lower percentage (9.3%) of them were in the age group of (above 18-20 years). This shows that the majority of the respondents were young women between the ages of 21-35 years and they are more likely to acquire this infection.

Respondents' educational status showed that majority (62.20%) are educated to the secondary level. This is in line with previous studies done by Abal et al, (2019) and Mehanna et al, (2020) in south - south Nigeria and Alexandria. This shows that educational level plays an essential part in positive health practices.

5.2.1 Knowledge of Self Medication

The findings from this study, shows that the respondents know what UTI is, and have an idea of its associated risks. Majority (53.0%) of the respondents said they were knowledgable of UTI and its associated risks, while 28.7% had poor knowledge and so did not know how to prevent acquiring the infection. This shows a high level of ignorance about Urinay Tract Infection and its associated risk factors. It could be as a result of incomplete health education given on the infection during ante-natal clinic. This is in contrast with the findings from a study by Okwu et al (2022) who found out that majority of the respondents had a sound knowledge of UTI and in line with Nwachukwu et al, (2018) who reported that the respondents have a poor knowledge on UTI.

The findings show that majority of the respondents are aware of the signs and symptoms of Urinary Tract Infection which make them seek health care services immediately the signs and symptoms are identified. The majority (52.9%) responded that UTI is developed through poor personal hygiene. The respondents also identified that burning sensations when passing urine (27%), urine incontinence (18.3%) and urine urgency (28.7%) are symptoms of UTI. This is supported by a study done in south-south Nigeria by Abal et al, (2019) but in contrast with a study done by Jasim et al, (2021). Although (2.2%) of the respondents stated to not know the effect of UTI on pregnancy, the majority showed good knowledge on the effect. The majority (80%) stated Low birth rate as an effect of UTI in pregnancy and (11.7%) stated still birth as an effect. Majority (67.2%) of the respondents stated that the treatment for UTI is taking medications while (16.5%) stated modification of lifestyle. This is in tune with the findings from a study by Okwu et al (2022) who found out that majority of the respondents had a sound knowledge of UTI.

5.2.2 Environmental factors associated with UTI

With reference to the findings of this study, the environmental factors associated with UTI includes inaccessibility to health care, inadequate materials to maintain good personal hygiene, unavailability of good toilets etc. Some respondents 80(34.8%) stated that access to quality health care is not affordable while 84(36.5%) of the respondents disagreed, stating that quality health care is accessible. This shows that accessibility of health care system to pregnant women is a factor that influences the development of Urinary Tract Infection in pregnant women. This is in line with the findings of Onyango et al, (2018) which found out that non availability of good toilets and inaccessibility of health care centres influences the occurrence of UTI in pregnancy.

Majority of the respondents 94(40.9%) stated that materials to support good personal hygiene such as clean clothes and under wears, clean water are not easily accessible due to location or unavailability of resources to fund this lifestyle. However, 70(30.4%) stated that they have access to materials needed to practice personal hygiene which is needed to carry out health behavioural practices that prevent UTI in pregnant women. From this study, it was discovered that accessibility to healthcare systems, availability of clean water, good toilet facilities, clean and well sanitized environment are factors that influences the development of UTI among pregnant women. This is in line with the findings of Onyango et al, (2018) which found out that non availability of good toilets and inaccessibility of health care centres. Area of residence however is not a factor.

5.3 Implication to Nursing Practice

The nursing practice trend towards health promotion will create opportunities for nurses to strengthen the profession's influence on health promotion through health education.

Nursing Practice: Nurses are in the unique position to enlighten these individuals, because they are always in contact with patients/client providing holistic care. For a nurse, to be able to give adequate information, she needs to have a thorough understanding on UTI, the effect on their health and measures to improve their practice. Nurses should endeavour to health educate this individuals, as they have the right to this knowledge, which will enable them to make informed decisions on their health.

Nursing Education: This is what is hoped to be achieved at the end of the day. With good knowledge of UTI, nurses will be better informed to give proper information to clients. Nurses should be involved in giving health education to patients with chronic illness, therefore emphasis must be laid on teaching patients on discharge in the clinic. Students should be involved in the process.

Research: In aspect of research, it increases the awareness of the severity of UTI and its researchability interest, by conducting more research to broaden their knowledge about physical fitness exercise.

5.4 Limitation of the Study

The study was with limitation. The respondents may have been biased in their responses to some items in the instrument, since data retrieved were based on self-reported information from them.

5.5 Summary

This study on the knowledge of UTI and associated risk factors among pregnant women in University of Benin Teaching Hospital, Benin City, Edo State shows the introduction to the

study which includes; the background of the study, statement of the problem, objectives of the study, research questions which assessed the knowledge of UTI and associated risk factors of UTI and social demographic factors. The literature reviewed various works that have previously been carried out in various places concerning UTI.

The research methodology, which is a quantitative descriptive design with a population of 230 respondents. The population was selected conveniently and data was collected with the use of questionnaire. Data was analyzed using frequency, percentages, mean and were presented in tables where applicable. Most of the respondents were aware of UTI and environmental factors associated with UTI was identified.

The study reported a high level of knowledge (71.3%) about Urinary Tract Infection in pregnant women in the University of Benin Teaching Hospital. The associated risk factors of UTI includes environmental factors and healthy behavioural practices. The study recommends health education by health personnel to enlighten pregnant women on the UTI, as most pregnant women look up to their medical professionals for information and guidance. Also follow up system should be put in place to ensure the attendance of ante-natal clinic schedule.

5.6 Conclusion

The findings of this study, suggests that in order to achieve the optimum goal of improving health in UTI. It is paramount that for effective strategies to be made, patients should be actively involved in the management of their health.

From the findings of thus research work, the researcher concluded that majority of the respondents have a good knowledge of UTI and environmental factors were identified. **5.6**

5.7 Recommendation

The following recommendations are therefore suggested based on the findings of this study.

1. Health education by health personnel to enlighten people on the UTI, as most people look up to their medical professionals for information and guidance.

2. Mass media outlets such as television, radio, road jingles and posters etc. should be used to disseminate useful information on the importance of physical fitness exercises.

5.8 Suggestions for Further Studies

The researcher recommends that further research may be carried out in the following areas:

1. Factors influencing the Occurance of UTI among pregnant women in a tertiary hospital Benin City.

REFERENCES

Adhikari, S., & Dhakal, R. (2015). Knowledge on urinary tract infection among primigravida women. *Int J Health Sci Res (IJHSR)*, *5*(10), 200-5.. Available from: https://www.semanticscholar.org/paper/knowledge-on-urinary-Tract-infection-among-Women.-Adhikari-Dhakal/7b9ebaf1eb749c66d38e4e5f60b5f737112a91ff

Awoke, N., Tekalign, T., Teshome, M., Lolaso, T., Dendir, G., & Obsa, M. S. (2021). Bacterial Profile and asymptomatic bacteriuria among pregnant women in Africa: A systematic review and meta analysis. *EClinicalMedicine*, *37*, 100952.. Available from: https://www.sciencedirect.com/science/article/pii/S2589537021002327 Doi 10.1016/j.eclinm.2021.100952.

Bono, M. J., Leslie, S. W., & Reygaert, W. C. (2022). Urinary tract infection. In *StatPearls [Internet]*. StatPearls Publishing. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470195/#_NBK470195_pubdet_

Brusch, J. L., Bavaro, M. F., Cunha, B. A., & Tessier, J. M. (2020). Urinary Tract Infection (UTI) and Cystitis (Bladder Infection) in Females: Practice Essentials, Background, Pathophysiology. *Medscape [Internet]*. Updated 2023. Available from: https://emedicine.medscape.com/article/233101-overview.

Czajkowski, K., Broś-Konopielko, M., & Teliga-Czajkowska, J. (2021). Urinary tract infection in women. *Menopause Review/Przegląd Menopauzalny*, *20*(1), 40-47. Available from: https://pubmed.ncbi.nlm.nih.gov/33935619/ Doi 10.5114/pm.2021.105382

Ezugwu, I. A., Afunwa, R. A., Onyia, F. C., Chukwunwejim, C. R., Offe, I. M., Onyia, C. O., ... & Eze, E. A. (2021). Prevalence of Urinary Tract Infections and Associated Risk Factors among Pregnant Women in Enugu Metropolis, Nigeria. *Journal of Biosciences and Medicines*, *9*(10), 156-171. Available from: https://www.scirp.org/journal/jbm.

Getaneh, T., Negesse, A., Dessie, G., Desta, M., & Tigabu, A. (2021). Prevalence of Urinary Tract Infection and Its Associated Factors among Pregnant Women in Ethiopia: A Systematic Review and Meta-Analysis. *BioMed Research International*, *2021*. Available from: https://pubmed.ncbi.nlm.nih.gov/34901276/ Doi 10.1155/2021/6551526.

Haddad, J. M., Ubertazzi, E., Cabrera, O. S., Medina, M., Garcia, J., Rodriguez-Colorado, S., ... & Castillo-Pino, E. (2020). Latin American consensus on uncomplicated recurrent urinary tract infection—2018. *International urogynecology journal*, *31*, 35-44. Available from: http://doi.org/10.1007/s00192-019-04079-5

Hinkle, J. L., & Cheever, K. H. (2018). *Brunner and Suddarth's textbook of medical-surgical nursing*. Wolters kluwer india Pvt Ltd.

Kalinderi, K., Delkos, D., Kalinderis, M., Athanasiadis, A., & Kalogiannidis, I. (2018). Urinary tract infection during pregnancy: current concepts on a common multifaceted problem. *Journal of Obstetrics and Gynaecology*, *38*(4), 448-453. Available from: https://pubmed.ncbi.nlm.nih.gov/29402148/ Doi 10.1080/01443615.2017.1370579.

Mwang'onde, B. J., & Mchami, J. I. (2022). The aetiology and prevalence of urinary tract infections in Sub-Saharan Africa: a Systematic Review. *Journal of Health & Biological Sciences*, *10*(1), 1-7. Available from: https://periodicos.unichristus.edu.br/jhbs/article/view/4501

Navarro, A., Sison, J. M., Puno, R., Quizon, T., Manio, L. J. J., Gopez, J., ... & Bundalian Jr, R. (2019). Reducing the incidence of pregnancy-related urinary tract infection by improving the knowledge and preventive practices of pregnant women. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, *241*, 88-93. Available from: https://pubmed.ncbi.nlm.nih.gov/31479991/ . Doi 10.1016/j.ejogrb.2019.08.018.

Nwachukwu, E., Onyebuchi, O., & Michael, O. (2018). Prevalence of urinary tract infections in pregnant women in Onitsha, Nigeria. *J Bacteriol Mycol Open Access*, *6*(5), 284-285. Available from: https://medcraveonline.com/JBMOA/prevalence-of-urinary-tract-infections-in-pregnant-women-in-onitsha-nigeria.html. Doi: 10.15406/jbmoa.2018.06.00219.

Onyango, H. A., Ngugi, C., Maina, J., & Kiiru, J. (2018). Urinary tract infection among pregnant women at Pumwani Maternity Hospital, Nairobi, Kenya: bacterial etiologic agents, antimicrobial susceptibility profiles and associated risk factors. *Advances in Microbiology*, *8*(03), 175. Available from: https://www.scirp.org/html/2-2271075_83183.htm

Öztürk, R., & Murt, A. (2020). Epidemiology of urological infections: a global burden. *World journal of urology*, *38*, 2669-2679.Available from: https://pubmed.ncbi.nlm.nih.gov/31925549/ Doi: 10.1007/s00345-019-03071-4.

Platte, R. O., Reynolds, K., Kim, E. D., Wolf, J. S., Johnson, E. K. (2021). Urinary Tract Infections in Pregnancy. Available from: https://emedicine.medscape.com/article/452604-overview

APPENDIX

DEPARTMENT OF NURSING SCIENCE

SCHOOL OF BASIC MEDICAL SCIENCES

UNIVERSITY OF BENIN

BENIN CITY, EDO STATE

Dear Respondent,

QUESTIONNAIRE

I am a student of the above-named institution and I am carrying out a research study on the topic: “Knowledge of Urinary Tract Infections and its Associated Risk Factors Among Pregnant Women in University of Benin Teaching Hospital, Benin City, Edo State”. Kindly assist me by indicating your opinion where necessary.

This study is strictly for academic purpose and you are hereby assured that all information supplied will be treated as confidential.

Thank you for your cooperation.

Yours faithfully,

Ehiabhi Uyiosaifo Frances.

SECTION A: SOCIO-DEMOGRAPHIC DATA

Please read the questions carefully and tick the most appropriate answer

1. Age: 18 – 20 years [ ]; 21-35 years [ ]; 36-39 years [ ]; 40 & above [ ]
2. Marital Status: Single [ ]; Married [ ]; Divorced [ ]; Widowed [ ]
3. Educational Qualification: No formal education [ ]; Primary [ ]; Secondary [ ]; Tertiary [ ]
4. Ethnicity: Bini [ ]; Esan [ ]; Hausa [ ]; Igbo [ ]; Yoruba [ ]; Others (specify)_____
5. Employment status: Employed [ ]; Unemployed [ ]; Self-employed [ ]
6. Religion: Christian [ ]; Muslim [ ]; others (specify): _____

SECTION B: KNOWLEDGE ON UTI AMONG PREGNANT WOMEN.

Please read the questions carefully and tick the most appropriate answer

1. Do you know about Urinary Tract Infections: (a) Yes [ ] (b) No [ ] (c) Don't know [ ]
2. Have you ever experienced UTI? (a) Yes [ ] (b) No [ ] (c) Don't know [ ]
3. A person develops UTI through which of the following ? (a) Failure to urinate after sexual activity [ ] (b) Eating too much [ ] (c) Wearing tight underwear [ ] (d) Wiping from back to front [ ] (e) poor personal hygiene
4. Which are the signs and symptoms associated with UTI? (a) Burning sensation when you pass urine [ ] (b) urge to urinate more frequently than usual [ ] (c) inability to hold urine before reaching the toilet [ ] (d) feeling like your bladder is full (e) pain in your lower abdomen
5. Which of these are effects of UTI on pregnancies? (a) Low birth weight [ ] (b) preeclampsia [ ] (c) Maternal anaemia (e) Still birth [ ] (f) Don't know [ ]
6. Which of the following behavioural practices helps in the prevention of UTI? (a) Cleaning the perineum from front to back after using the toilet [ ] (b) Wearing loose under wears [ ] (c) Drinking plenty water [ ] (e) Keeping your Antenatal appointments [ ]
7. Do you know that avoiding fluids that irritate the bladder such as alcohol aids in UTI prevention? (a) Yes [ ] (b) No [ ] (c) Don't know [ ]
8. Treatment of UTI includes: (a) Medicine [ ] (b) Diet [ ] (c) Tests [ ] (d) Lifestyle modifications [ ] (e) Don't know [ ]

SECTION C: ENVIRONMENTAL FACTORS ASSOCIATED WITH UTI AMONG PREGNANT WOMEN.

Strongly Disagree (SA); Disagree (D); Agree (A); Strongly Agree (SA)

Please read the questions carefully and tick the most appropriate answer

S/N	QUESTIONS	SD	D	A	SA
1.	Accessibility to quality health care is usually affordable.				
2.	Living with family and loved ones makes it easier to carry out good health behavioural practices.				
3.	Family/loved ones provide emotional and physical support during pregnancies.				
4.	Materials to carry out good personal hygiene practices like taking frequent baths, putting on clean clothes and under wears are easily accessible.				
5.	The kind of toilets available for use are usually pit toilets.				
6.	Living environment is usually well sanitized and comfortable.				
7.	Area of residence is located in rural area.				

SECTION D: HEALTH BEHAVIOURAL PRACTICES ASSOCIATED WITH UTI AMONG PREGNANT WOMEN.

Strongly Disagree (SA); Disagree (D); Agree (A); Strongly Agree (SA)

Please read the questions carefully and tick the most appropriate answer

S/N	QUESTIONS	SD	D	A	SA
1.	Visitation to the clinic immediately when faced with a symptom of UTI is the right thing to do.				
2.	Good personal hygiene practices like taking frequent baths, putting on clean clothes and under wears should be carried out necessarily.				
3.	Engagement in sexual activities while treating UTI is the right thing to do.				
4.	Participating in sexual activities with multiple sex partners is a good practice.				
5.	Wiping from back to front after using the toilet is the right way to clean up yourself.				
6.	Drinking of alcohol and carbonated drinks during pregnancy is				

	acceptable.				
7.	Regular drinking of water is very important.				
8.	Previous treatment of UTI does not increase the risk of developing UTI.				
9.	Regular visitation of clinic on days of appointments is a good behavioural practice.				
10.	Wearing of clean and loose under wears is good practice during pregnancy.				