

**PREVALENCE AND ASSOCIATED RISK FACTORS OF URINARY TRACT
INFECTIONS IN PREGNANT WOMEN ADMITTED ON MATERNITY WARD IN
JINJA REGIONAL REFERRAL HOSPITAL**

BY

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**A RESEARCH PROPOSAL SUBMITTED TO THE FACULTY OF CLINICAL
MEDICINE AND DENTISTRY OF KAMPALA INTERNATIONAL UNIVERSITY
WESTERN CAMPUS IN PARTIAL FULFILLMENT OF AWARD OF A BACHELOR OF
MEDICINE AND A BACHELOR OF SURGERY**

JUNE 2018

DECLARATION

I,student of medicine and surgery, at Kampala international university western campus, declare that this research proposal is my own original work and has never been produced before by anybody for the award of bachelor’s degree in medicine and surgery in this institution.

.....

.....

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DATE

APPROVAL

I, the undersigned, certify that I have read through and hereby recommend for the acceptance by Kampala international university under graduate department, the proposal titled, **prevalence of urinary tract infections and associated risk factors in pregnant women admitted on maternity ward in Jinja regional referral hospital.**

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SIGNATURE.....

DATE.....

DEDICATION

This dissertation is dedicated to my Parents, and my two sisters for their continuous support and encouragement.

ACKNOWLEDGMENTS

All thanks and praises to the Almighty God for helping me through the difficult times, fulfilling my needs and for keeping me alive to conduct this study. I would like to appreciate and thank my supervisor Dr Nyolia James for his guidance, patience and support towards the success of this study.

My gratitude also goes to the patients who provided data necessary to make this study a success.

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ABSTRACT

Background

Globally, urinary tract infection and its associated problems are the cause of nearly 150 million deaths per year. The disease can progress in 40-50% of women (Totsika et al., 2012). The prevalence of urinary tract infections in pregnancy ranges from 13-33%, with asymptomatic bacteriuria occurring in 2–10%.

Urinary tract infection (UTI) is the most common disorder caused by bacterial agents in pregnancy, which can lead to important complications in newborn of such mothers in case of inappropriate diagnosis and treatment.

Methods

The aim of this study was to determine the prevalence of and associated risk factors of urinary tract infections among pregnant women admitted on maternity ward at Jinja Regional Referral Hospital. The study was a descriptive cross-sectional study using quantitative methods. The calculated sample was 150. Data was collected from pregnant women admitted on maternity ward. Data was coded and tabulated using SPSS program.

Results

14% of the studied women had urinary tract infection. Factors associated with UTI during pregnancy were previous low socio-economic status; null parity; low education level and increasing gestational age.

Frequency of urination followed by supra-pubic pain, then nocturia, were the common complaints.

Conclusion

Urinary tract infections remain a prevalent problem during pregnancy especially, in developing countries. Genital hygiene, urination habits and low socioeconomic status play significant role in the occurrence of UTI during pregnancy. These findings could be attributed to lack of knowledge about UTI risk factors and its prevention during pregnancy.

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OPERATIONAL DEFINITIONS

Antibacterial agent: Agent that kills or stops the growth of bacteria.

Dysuria: Difficulty or pain in urination

Frequency: The need to urinate more often than usual; once every 1 to 2 hours.

Hematuria: Presence of red blood cells in the urine

Urgency: Sudden, compelling desire to urinate, a sensation that is difficult to defer.

Urinalysis: Physical, chemical, or microscopic analysis of urine to test for the presence of disease, drugs or toxins.

Urinary tract infection: Infection involving any part of the urinary system; including the kidneys, ureters, urinary bladder, and the urethra.

LIST OF ABBREVIATIONS

AIDS:	Acquired immune deficiency syndrome
DHO:	District health officer
E.coli:	Eschericia coli
E.g:	For example
E.t.c:	And others
HIV:	Human immunodeficiency virus
HOD:	Head of department
I.e.:	That is to say
JRRH:	Jinja Regional Referral Hospital
KIU:	Kampala International University
Lab:	Laboratory
LNMP:	Last normal menstrual period
MOH:	Ministry of health, Uganda
OBGYN:	Obstetrics and gynecology
RVF:	Rectovaginal fistula
SPSS:	Statistical package for social science
Tel:	Telephone
UTI:	Urinary tract infection
VVF:	Vesicovaginal fistula
WHO:	World health organization
WOA:	Weeks of amenorrhea.

CHAPTER ONE

1.1 Background

Urinary tract infection refers to both microbial colonization of the urine and tissue invasion of any structure of the urinary tract. Bacteria are most commonly responsible although yeast and viruses may also be involved.

Urinary tract infection (UTI) is the most common disorder caused by bacterial agents in pregnancy, which can lead to important complications in newborn of such mothers in case of inappropriate diagnosis and treatment.

UTIs are the most common bacterial infections of pregnancy. UTI is a major health problem, it has been reported among 20% of the pregnant women and it is the most common cause of admission in obstetrical wards (J.Bacak *et al.*, 2005). Symptomatic and asymptomatic bacteriuria has been reported among 17.9% and 13.0% pregnant women, respectively (A.Masinde *et al.*, 2009).

1.1.1 Historical background

Globally, urinary tract infection and its associated problems are the cause of nearly 150 million deaths per year. The disease can progress in 40-50% of women (Totsikaet *al.*, 2012). The prevalence of urinary tract infections in pregnancy ranges from 13-33%, with asymptomatic bacteriuria occurring in 2–10%. Asymptomatic bacteriuria is now arecognized entity in the range of urinary tract infections (Agersewet *al.*, 2012). Asymptomatic urinary tract infection, is separation of a stated quantity of bacteriain an suitably collected urine sample obtained from a person with no symptoms or signs of urinary tract infection (Nicolle *et al.*, 2015)

Urinary tract infections represent the most common bacterial infection in pregnancy (Harvey, 2009). Expectant women are at a greater risk for urinary tract infection, beginning in week 6 and peaking during weeks 22 to 24 (Agersewet *al.*, 2012). This is due to a number of structural and physiological factors, with the occurrence of infection of the kidney increasing in the third trimester of pregnancy. The prevalence is constant and most of the recent studies, in developing and developed countries, report similar rates (Schnarr and Smail, 2008).

According to studies done in Tanazania, the prevalence of urinary tract infections among pregnant women was15.5% (Masinde et al., 2009) and 13.3% in Uganda (Andabati and Byomugisha, 2010).

Similar studies done in Sudan revealed the prevalence to be at 14 % (Hamdan *et al.*, 2011).

Antepartum urinary tract infection has been found to be associated with poor perinatal outcomes and adverse obstetric impediments. Furthermore, it has been observed that asymptomatic bacteriuria can lead to cystitis and pyelonephritis which can lead to acute respiratory distress, transient renal failure, sepsis and shock during pregnancy (Hamdan, Z.; *et al* 2011).

Screening for and treatment of urinary tract infection in pregnancy has become a standard of obstetric care (MOH, 2010).

Urinary tract infections in pregnancy are among the commonest health problems globally, particularly in low income countries (Delzell, 2014). The financial burden of urinary tract infection in adult females is noteworthy. The health care costs associated with urinary tract infections in terms of morbidity, number of bed occupied, fewer staffs and resource are also great and include considerable financial constraints to pregnant women (Griebing, 2011).

Even though gestation does not upsurge the rates of urinary tract infection, it increases the possibility that it will progress to a full-scale kidney infection, which can cause premature labor and other grave pregnancy complications. Pregnant women are at an increased threat of urinary tract infection, starting in earlier weeks of gestation, with the incidence of infection of the kidney increasing in the third trimester (Dafnis *et al.*, 2012).

1.1.2 Theoretical background

In order to understand urinary tract infection in local context, this study will be based on the health-belief model by Irwin *et al.*, (1950); that is people seek medical attention only if they have an idea of the danger of a given illness. It means that consultation is triggered by the perceived threat to health, like severity; the degree to which the patient believes a consultation will be effective in decreasing the threat.

1.1.3 Conceptual background

The physiological and anatomical changes during pregnancy facilitate the growth of bacteria both symptomatic and asymptomatic in women. Pregnancy is an aggravating factor for the asymptomatic to become symptomatic (Doland, 2012). It is difficult for a pregnant woman to expel urine as quickly and easily as she does normally (Sabatini, 2015). Hormonal effects particularly throughout pregnancy and post-menopause increases the risk for UTI because of absence of estrogen. Estrogen

loss reduces the ability to resist bacteria, as a result of reduced immune factors in the vagina that help block *E. coli* from adhering to vaginal cells (Harvey, 2009). The acidic nature of vaginal fluid will be reduced. This acidity is essential for the growth of *Lactobacillus* in the normal vaginal flora. This is a natural host defense mechanism against symptomatic urinary infection (Griebing, 2011). Differences in urine PH and osmolarity and presence of glucose in urine in pregnancy and aminoaciduria facilitate bacterial growth (Schnaret *al.*, 2014). Throughout pregnancy, due to the abdominal distension, women find it difficult to clean their genitalia well and this contributes to the incidence of urinary tract infections in pregnancy.

1.2 Problem statement

Globally, prevalence of urinary tract infection in pregnancy is 1.9-9.5%. Tanzania accounts for 13 % and Uganda has 13.3% (Andabati and Byamugisha, 2010). This could be due to the apparent fall in the immunity of pregnant women (Nicolle *et al.*, 2010). Asymptomatic bacteriuria shows the vigorous reproduction of bacteria in the urinary tract (WHO, 2014). About 10% of those with asymptomatic bacteriuria develop symptomatic bacteria in urine in pregnancy (Bailey., 2012).

Minus early detection, urinary tract infections may lead to kidney injury, high blood pressure in pregnancy among others (Kerure *et al.*, 2013). The reasonably high prevalence of urinary tract infection in pregnancy and its consequences on women and on their pregnancies prompted Uganda Ministry of Health to include screening for and treatment of urinary tract infection in pregnancy in the standard obstetrics (MOH, 2010).

Jinja Regional Referral Hospital maternity ward records show that approximately 6 mothers out of 10 admitted during the month of May 2018 on the ward had UTI. In April 2018, a similar survey in the maternity ward records showed that of the 45 mothers admitted with preterm and threatening preterm labor, 15 had UTI.

With the above statistics, urinary tract infection poses a major health risk among pregnant women. By early diagnosis and identification of specific micro-organism, treatment will be initiated hence helping in the reduction of morbidity and mortality among this vulnerable group and their new born.

However, no enough data is available from this part of the country and in particular JRRH, on the prevalence of urinary tract infection in pregnant women coupled with absence of a standard protocol for early detection of asymptomatic bacteriuria in this hospital.

It is on this basis therefore that this research is proposed to determine the prevalence of urinary tract infections and risk factors associated with UTI that will subsequently be useful in generating a standard protocol for early detection of both symptomatic and asymptomatic UTI in this hospital.

1.3. Broad objective

To determine the prevalence and associated risk factors of urinary tract infections among pregnant women admitted on maternity ward in JRRH.

1.4 Specific Objectives

1. To determine the prevalence of urinary tract infections in pregnant women admitted on maternity ward in JRRH.
2. To identify risk factors associated with urinary tract infections in pregnant women admitted on maternity ward in JRRH.

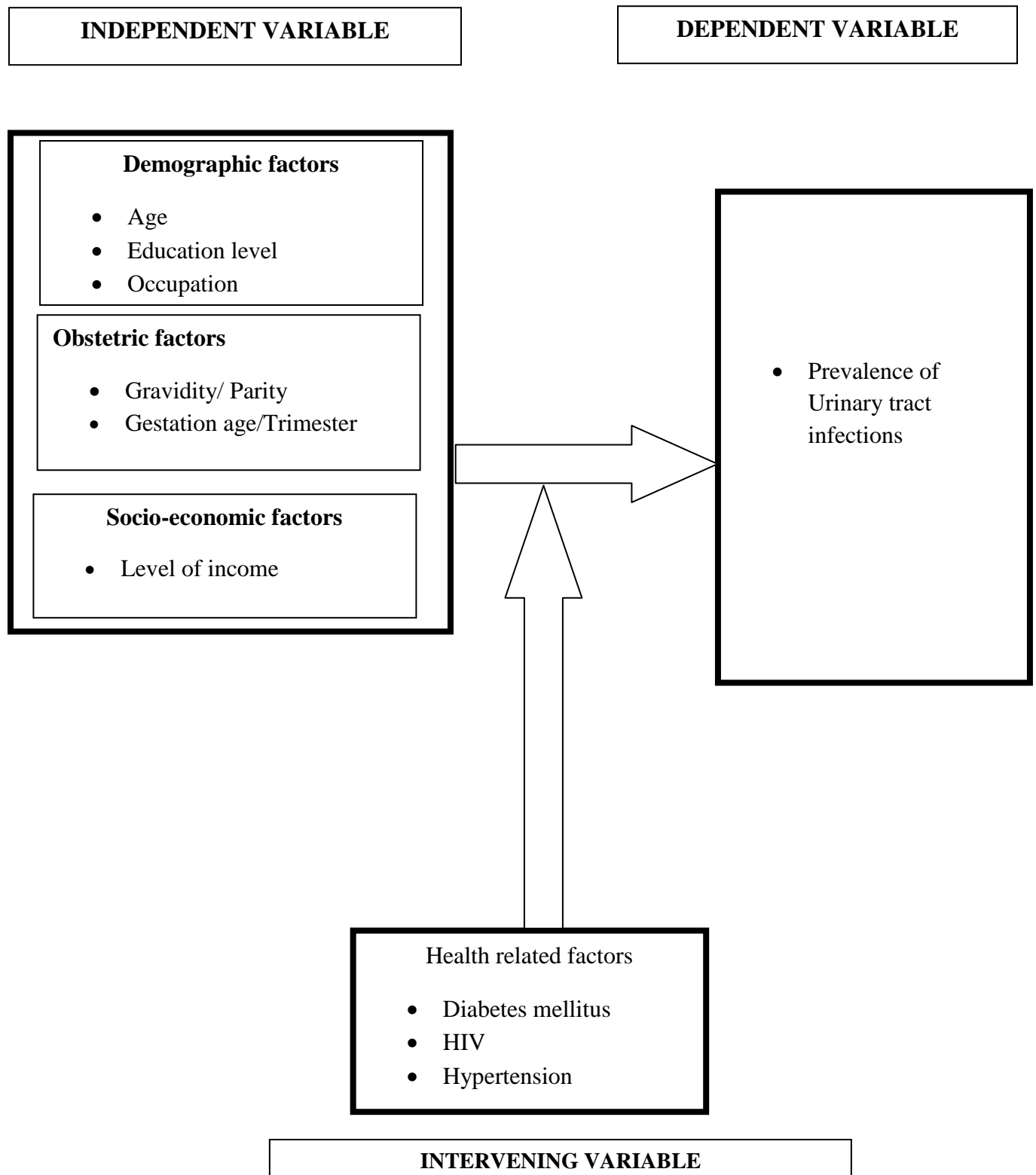
1.5 Research questions

1. What is the prevalence of prevalence of urinary tract infections in pregnant women admitted on maternity ward in JRRH?
2. What are the risk factors associated with urinary tract infections in pregnant women admitted on maternity ward in JRRH?

1.6 Significance of the study

Since urinary tract infection is common, and results in poor pregnancy outcomes, this study will help identify the determinant factors affecting the prevalence of UTI in pregnant women. It will also help identify the associated risk factors of UTI's in pregnancy thus facilitating management of this condition. It will further help in the development of treatment protocol and hence reduce resistance to medication. To the Community, the study shall reduce maternal and neonatal morbidity and mortality.

1.7 Conceptual framework



Interpretation of conceptual framework

Risk factors such as age, occupation, level of education, socioeconomic status, gravidity, parity, gestational age, and genetic factors are thought to influence prevalence of urinary tract infections. These are considered under independent variables.

Health related factors for example; chronic diseases such as hypertension, diabetes mellitus, HIV/AIDS, may also indirectly influence the prevalence of UTI in pregnant women by lowering body immune mechanisms, thus creating a conducive environment for the bacteria to thrive. These factors are categorized under intervening variables.

1.8 Scope of the study

1.8.1 Time scope

The study will cover a period of three months from May to July 2018.

1.8.2 Geographical scope

The study will be carried out at Jinja Regional Referral Hospital.

1.8.3 Content scope

The study will include the determination of the prevalence of UTI in pregnant women admitted on maternity ward at JRRH. It will also identify the risk factors associated with UTI in pregnant women admitted on maternity ward in this hospital.

CHAPTER TWO

LITERATURE REVIEW

2.1 Prevalence of urinary tract infection

Globally, urinary tract infection and its associated problems are the cause of nearly 150 million deaths per year. The disease can progress in 40-50% of women (Totsika et al., 2012). The prevalence of urinary tract infections in pregnancy ranges from 13-33%, with asymptomatic bacteriuria occurring in 2–10%.

Urinary tract infection (UTI) is the most common disorder caused by bacterial agents in pregnancy, which can lead to important complications in newborn of such mothers in case of inappropriate diagnosis and treatment.

UTIs are the most common bacterial infections of pregnancy. UTI is a major health problem, it has been reported among 20% of the pregnant women and it is the most common cause of admission in obstetrical wards (J.Bacak et al., 2005). Symptomatic and asymptomatic bacteriuria has been reported among 17.9% and 13.0% pregnant women, respectively (A.Masinde et al., 2009).

Minus earlier detection, urinary tract infection can cause kidney injury, high blood pressure in pregnancy, among others (Kerure *et al.*, 2013). The reasonably high prevalence of asymptomatic urinary tract infection in pregnancy and its consequences on women and on their pregnancies prompted Uganda ministry of health to include screening for and treatment of urinary tract infections in pregnancy in the standard obstetrics and antenatal care guidelines (MOH, 2010).

2.2 Risk factors associated with urinary tract infections.

The incidence of urinary tract infections hinge on various demographic, genetic, social as well as some anatomic and metabolic factors (Athira, 2016).

2.2.1 Age

Urinary tract infection during pregnancy is common and high in age group between 26-35 years. The high incidence of UTI in the young reproductive age group is due to early pregnancy particularly in the remote settings. Many studies considered advances in age a risk factor for getting UTI in

pregnancy because there is decline in glycogen level, deposition and decrease in the *Lactobacillus* as part of ageing progression which increases bacterial adherence and attack by pathogens and make them more vulnerable(Athira, 2016)

Majority of urinary tract infection among pregnant women is well-known in age group 26-30 years, followed by 21-25, and 31-35years. The youngest among those studied was 18 years and oldest 45 years(Care et al., 2016).

Parallel outcomes were obtained in a study conducted by Kasinathan *et al.*, (2014) from Pondicherry, with maximum subjects with urinary tract infection in the age group of 26-30 years(Bose and Pulikkottil, 2016).

Turpin et al (2011) found that UTI was more prevalent in older age group. This can be explained by decreased level of sex hormones in the aging process. Apart from this, the increase in age is also associated with increased glycogen level, reduced *Lactobacillus* colony, acidity of the vagina, and prevention of pathogen colonization, leading to increased vulnerability to ASB (Hassan, et al., 2010).

2.2.2 Education level

Lower levels of education and low socio-economic grade have correlation with higher prevalence of ASB in many studies and reports (Mokube et al., 2013). This is because education improves the attitudes and beliefs of women. However, according to Onu et al., (2015), level of education of the participants did not have any significant association with ASB; which disagrees with Mokube et al., 2013.

2.2.3 Socio-economic factors

The prevalence of urinary tract infection was found to vary with socio-economic status of respondents. The prevalence was higher in women with low socio-economic status compared to middle and higher classes (Fatima and Ishrat, 2016)

However, according to Aiyebilehin et al., (2013), no relationship was established between UTI and social-economic status of the pregnant women in his study.

2.2.4 Obstetric factors

2.2.4.1 Gravidity

According to Kerure *et al.*, (2013), urinary tract infection in pregnancy was more common among women with first pregnancies (53.85%) compared to multi-gravidae (46.15%). This study shows that nulliparous women are more susceptible to UTI compared to multiparous women. A study by Ajayiet *al.*, (2012) in Nigeria also gave similar results (Care *et al.*, 2016).

Parity and gestational age considerably affect the prevalence of urinary tract infection. These have been previously reported in many studies (Halder *et al.*, 2010)

2.2.4.2 Gestational age

Pregnant women in their third trimester of current pregnancy and those having more than one child were mostly susceptible to acquire urinary tract infection. Numerous anatomical and hormonal variations in pregnant women lead to urethral dilation and urinary inertia which increased changes of developing UTI (Bankole *et al* 2015)

Studies have shown that with respect to trimester, majority of the pregnant women with UTI were in third trimester, followed by second trimester and first trimester (Length, 2015)

Bacteriuria is common in five to ten weeks of gestation, followed by ten to fifteen weeks and fifteen to twenty weeks. This finding was in line with the finding of the study conducted by Chandelet *al.*, (2012). This contradict the study done by length, (2015)

According to a study by Agersewet *al.*, (2013) from Ethiopia, (12.2%) of study subjects had history of urinary tract infection.

2.2.5 Genetic Factors

The presence of P-antigens on ABO blood group in the uro-epithelial cells act as receptors for *E. coli* adhesion. In people with secretor status, ABO blood group antigens are secreted in body fluids to cover the receptors for *E. coli* adhesion. Therefore, such persons hardly suffer from UTI. Comparatively, for persons having no secretor status, the receptors for *E. coli* adhesion are uncovered and exposed for attachment of bacteria hence resulting into recurrent UTI (Care *et al.*, 2016)

Around 4-7 per cent of pregnant mothers suffer from UTI during their pregnancies and about 25-30% of them develop acute pyelonephritis. The important cause for their predilection is dilatation of pelvis and ureters, impediment to flow of urine from the bladder and hormonal changes (Musbau and Muhammad, 2013).

Abnormalities such as vesico-rectal and vesico-vaginal fistulae, trauma to urinary tract from accident or operation, increases the chances of getting urinary tract infection in pregnant women. Such mothers do not go for checkup and may progress to complicated UTI (Samuel *et al.*, 2016).

Metabolic factors like diabetes mellitus are associated with a high prevalence of perianal colony by potential pathogens. Presence of glucose in urine increases occurrence and severity of infection in mothers with diabetes mellitus (Emili *et al.*, 2012).

2.3 Common causative agents of urinary tract infections in pregnant women

The commonest organism is *E. coli*, which is accountable for 75-90% of bacteriuria in pregnancy. Other common organisms include *Klebsiella pneumoniae* (15%), *Pseudomonas* (10%), and *Proteus* (5%). 40% of the asymptomatic bacteria in urine cases develop into acute symptomatic UTI (Amiri *et al.*, 2015).

In an earlier study conducted by Amiri *et al.*, (2014) in Babol city, *E. coli* was found to cause 83% of UTIs in pregnant women followed by *staphylococcus saprophyticus*, *enterococcus* (4%) and *Proteus* (Al-aali, 2015).

Also, results from the studies of Mobbasheri *et al.*, (2011) in Gorganmark showed that *E. coli*, coagulase negative *Staphylococci*, and *Klebsiella* are the major causes of UTIs among pregnant women. (Al-aali, 2015)

This was consistent with the findings by Akerele in Benin and Oyagade in Ado-Ekiti, who also found *Staphylococcus aureus* as the predominant isolate (Mbbs, 2012).

The results from the study of Emamghorashi in Jahrom also indicate the major role of *E. coli* in UTIs among pregnant women in those regions, which included more than half of all cases. Studies conducted by Masinde in Tanzania (2016), Al-Haddad in Yemen (2014), Hamdan in Sudan (2015) and Totsikain Australia (2017), show that *E. coli* was the main cause of UTIs among women in those areas.

Regardless of gestation age, *E. coli* predominated as the etiologic agent of urinary tract infection, followed by *Staph. aureus*. *Candida albicans* was also found to cause UTI in a study conducted in Nigeria (Bankole et al., 2015)

CHAPTER THREE

METHODOLOGY

3.1 Study design

This will be a descriptive cross sectional study using both quantitative and qualitative methods. Data will be collected using a questionnaire.

3.2 Study Area

The study will be conducted on maternity ward which belongs to the obstetrics and gynecology department of Jinja Regional Referral Hospital.

JRRH commonly known as Jinja Hospital is a government regional referral hospital located in eastern Uganda about 80km from Kampala City. The coordinates of Jinja Hospital are: 00 25 52N, 33 12 18E (Latitude: 0.4310; Longitude: 33.2050).

JRRH is the largest hospital in Eastern Uganda with a bed capacity of 600 patients. It is the Regional Referral Hospital for the districts of Bugiri, Iganga, Jinja, Buvuma, Kaliro, Kamuli, Mayuge, Kayunga and parts of Mukono.

The obstetrics and gynecology department headed by a senior consultant obstetrician and gynecologist is comprised of both inpatient and outpatient sections. The inpatient section consists of intrapartum (labor suite), as well as post natal ward. It also has special isolation rooms for mothers with sepsis as well as preeclampsia. The outpatient section consists of special clinics including antenatal care clinic, postnatal clinic, gynecology clinic and family planning unit.

The maternity is a 60 bed section that admits between 300-500 mothers per month.

3.3 Study population

Pregnant women admitted on maternity ward in JRRH.

3.4 Inclusion and exclusion criteria

Inclusion criteria

Pregnant mothers admitted on maternity ward.

Exclusion Criteria

Mother with history of diabetes mellitus.

The immuno-suppressed such as those with HIV/AIDS.

Mothers who will decline to consent will be excluded and replaced

3.5 Sample size determination

Sample size will be determined using the formula by Susan Rose et al, 2015.

$$N=4PQ/D^2$$

Where n = required sample size, 4 standard value, p = estimated proportion of pregnant women with UTI, 10% (0.1), d = margin of error at 5% (standard value of 0.05) and Q = 1-P.

$$N=144.$$

10% shall be added for non-respondents and increase precision in the collection of specimen. The sample size shall therefore be **150**.

3.6 Technique of sampling participants

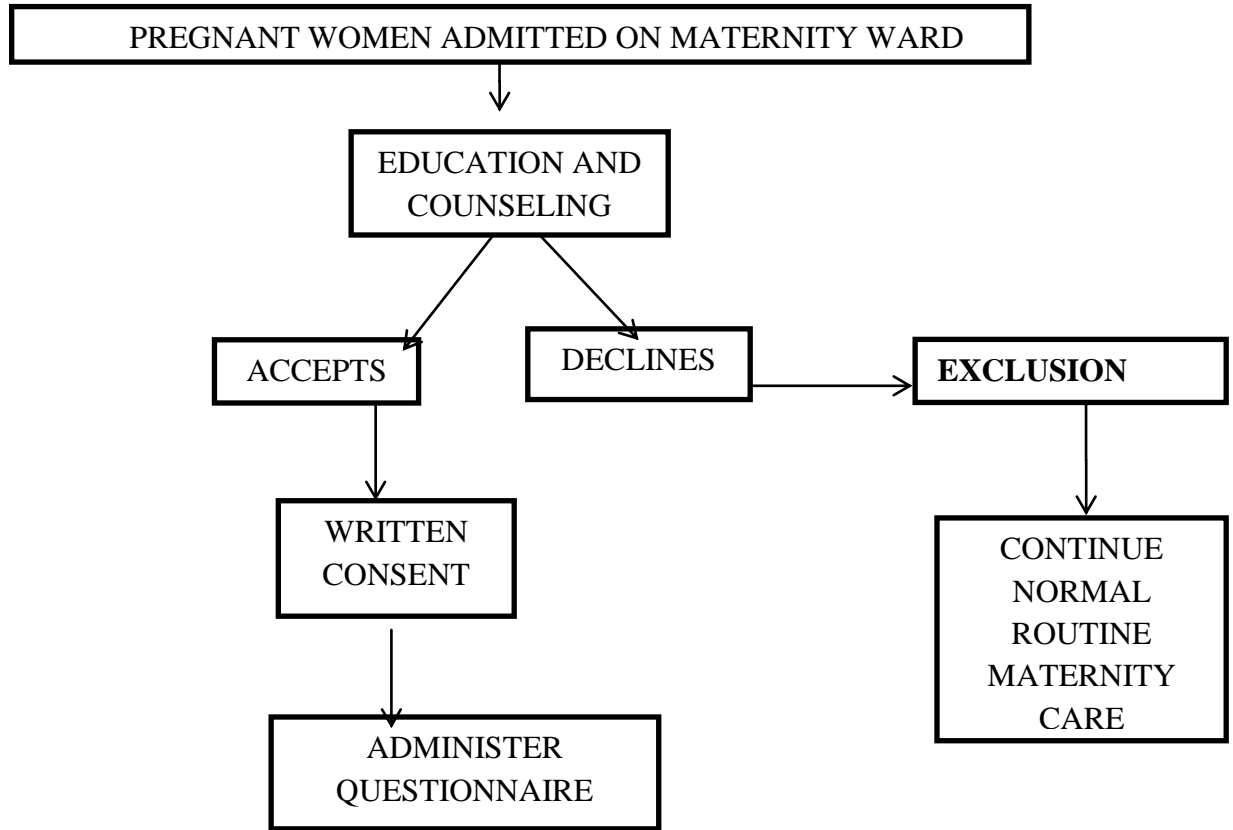
Simple random sampling method will be employed in selecting respondents. Respondents shall be selected from the attendance register and assigned numbers. Pregnant women with an odd numbers admitted on maternity ward shall be recruited for the study. If consent is denied the next respondent with an odd number shall be recruited for the study.

3.7 Study variables

Dependent variable is prevalence of UTI, measured by evaluating symptoms of UTI such dysuria, increased urinary frequency among others. Urinalysis is another tool for measuring the prevalence of urinalysis.

Independent variables are demographic factors, obstetric and socioeconomic factors such as occupation, level of income and education.

3.8 FLOW CHART



3.9 Data collection

Data collection instruments: Questionnaire.

The respondents with inclusive criteria shall be educated and counseled about the study. Those who accept to participate shall consent in writing and proceed to fill up a questionnaire. Using the questionnaire, research assistants will record the demographic factors (age, education level and occupation), obstetric factors (gravidity, parity and gestational age), genetic factor (blood group of the participant), socio-economic status (level of income) and risk factors associated with UTI.

3.10 Data quality control

There will be pretesting of the questionnaires and training of the research assistants to enable correct collection of the right data.

Research assistants will be trained in questionnaire administration; these will be fluent speakers of Lusoga, Luganda and English. The data collection will be supervised by the chief researcher and at random five questionnaires will be checked for consistency and completeness.

3.11 Data analysis

Data will be checked for completeness and enter into a computer, analyzed at different levels. Statistical analyses will be carried out using the statistical package for the social science (SPSS), Version 21 to summarize continuous variables with descriptive statistics.

While a chi-square test will be employed to analyze the relationship between demographic factors and prevalence of UTI multiple regression analysis will be applied to eliminate any confounding factors associated with the urinary tract infections in pregnancy. Significance will be measured at 95% confidence and $P < 0.05$ will be considered significance in all inferential tests conducted.

Objective 1: Descriptive statistics followed by a chi-square test will be conducted for bivalent data to determine the prevalence of UTI in pregnant women.

Objective II: Individual risk factors significantly associated with UTI in pregnancy will be determined.

3.12 Data presentation

Data will be presented in forms of tables, pie charts and graphs.

3.13 Study limitation and Delimitations.

- Generalization of the study findings will be only in the institution.
- Duration of study may be short.
- The genetic factors responsible for asymptomatic bacteriuria and drugs resistance are beyond the scope of the study.

3.14 Ethical consideration

In order to make sure that the study was ethically sound, the researcher fulfilled the following issues:

3.14.1 Institutional consent

Approval will be provided by the research and ethics committee of Jinja Regional Referral Hospital. At health facility level, permission from the Hospital research committee will be sought to allow access to the patients.

3.14.2 Privacy and confidentiality

Privacy will be ensured by making sure that information collected does not contain an individual identity. All questionnaires will be coded. To ensure confidentiality, the information collected will be kept under key and lock and only accessible to the researcher for use. Participants will be interviewed separately from other clients to avoid breach of privacy and confidentiality.

3.14.3 Informed consent

Participation in this study will not in any way be compulsory. Detailed information about the study will be explained to the participants. After understanding all the details, informed consent forms will be issued and written consent obtained.

3.13.4 Justice

Every respondent will be given equal opportunity to participate in the study. Systematic random sampling method will be used to select the participants to ensure that all respondents have equal chance of being selected for the study.

3.13.5 Respect of individual person (human right)

Each respondent will have an entitlement to her opinions, response and comments and every response provided during the course of the study will be respected. Potential respondents who will decline to participate in the study will be respected.

3.13.6 Benefit and risk

The participants who will be diagnosed with UTI will be prescribed appropriate antibiotics so as to prevent it from progressing to kidney injury and other complications.

Participants will be educated about avoidance of preventable risk factors for UTI in pregnancy

Feasibility of the study

The study is feasible since the maternity ward receives more than 300 – 600 pregnant women per month.

CHAPTER FOUR

4.0 Data analysis and presentation

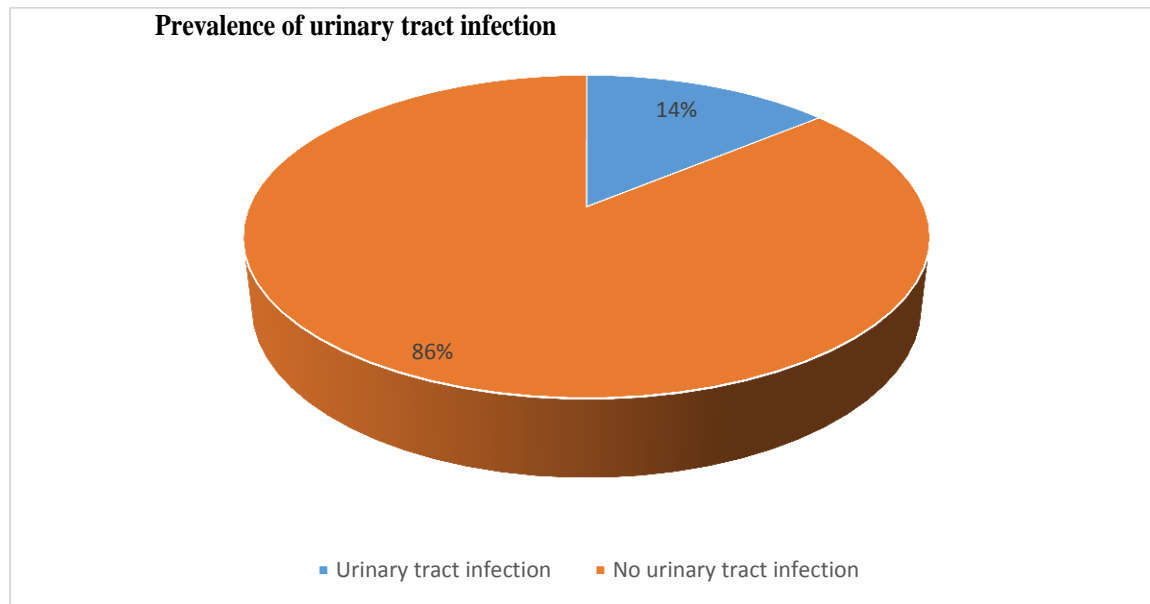
4.1 Introduction

This chapter discusses the data analysis and findings from 150 questionnaires that were completed by pregnant mothers admitted on maternity ward in Jinja Regional Referral Hospital between August and September 2018. The purpose of this study was to determine the prevalence and associated risk factors of urinary tract infections among pregnant women admitted on maternity ward in Jinja Regional Referral Hospital.

Questionnaires were given to pregnant women admitted on maternity ward in JRRH; after obtaining written consent. The signed consent forms were folded and placed into a separate box from the anonymously completed questionnaires to ensure no consent form could be linked to a particular questionnaire.

4.2 Prevalence of urinary tract infection

Figure 1: A pie chart showing prevalence of urinary tract infections



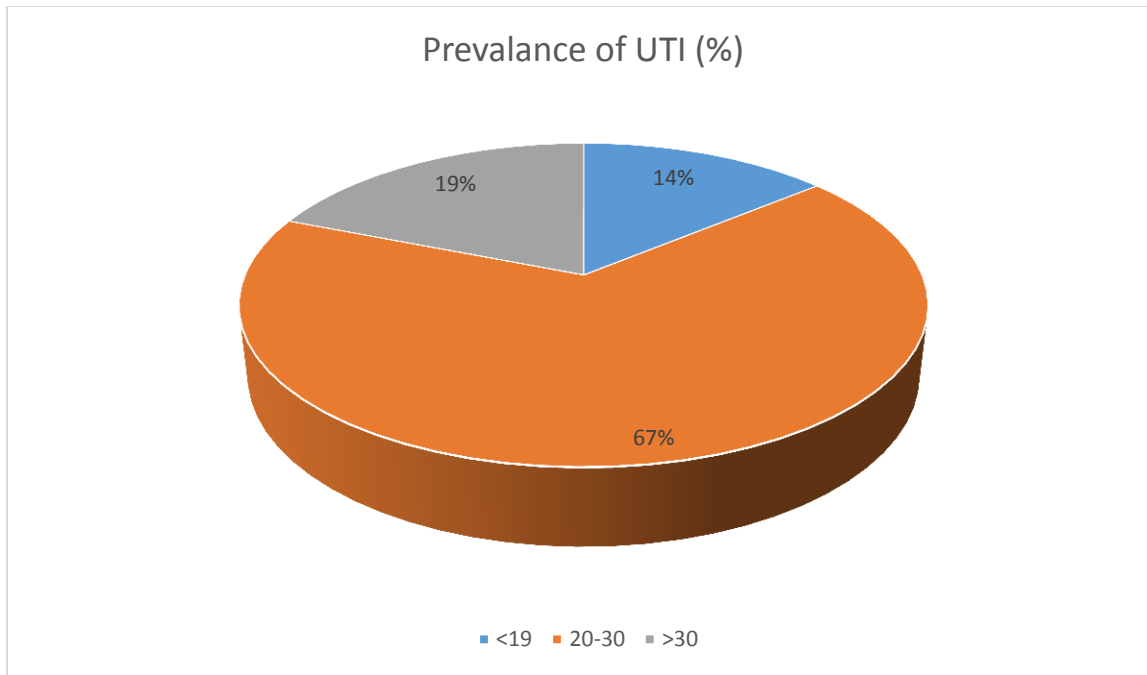
4.3 Demographic factors and prevalence of urinary tract infections

4.31 Age and prevalence of urinary tract infections

Table 1: Age and prevalence of urinary tract infections

Age (years)	Prevalence of urinary tract infection (%)
<19	14
20-30	67
>30	19

Figure 2: A pie chart showing age and prevalence of urinary tract infections

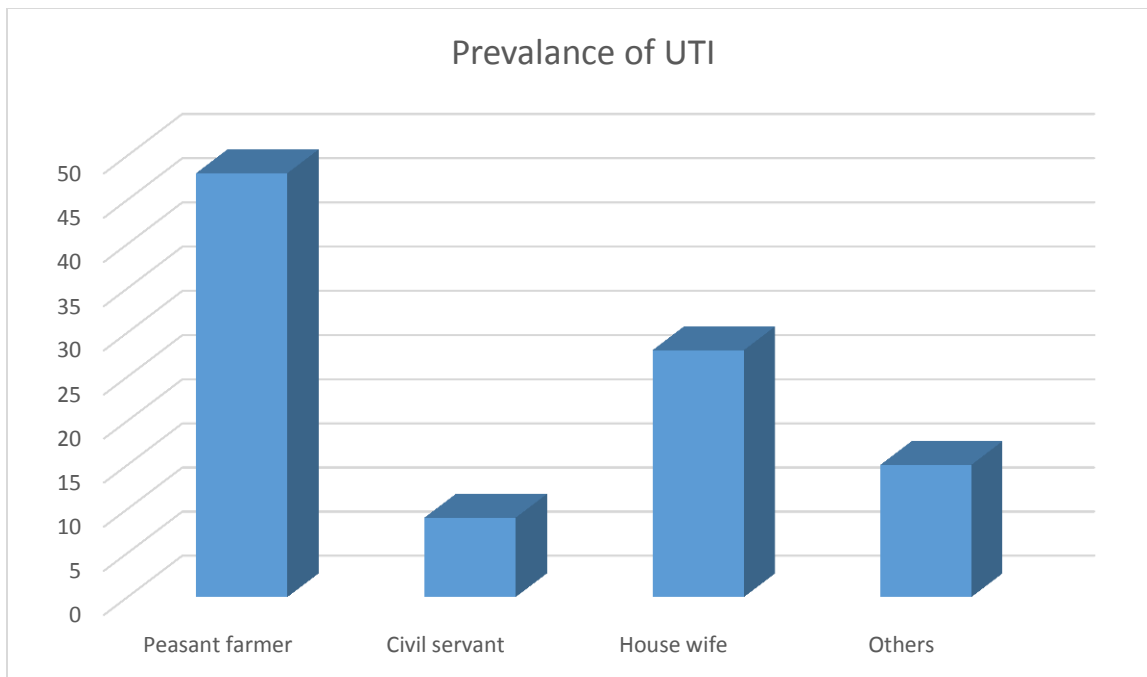


4.32 Occupation and prevalence of urinary tract infections

Table 2: Occupation and prevalence of urinary tract infections

Occupation	Prevalence of urinary tract infection (%)
Peasant farmer	48
Civil servant	9
House wife	28
Others	15

Figure 3: Graph showing occupation and prevalence of urinary tract infections

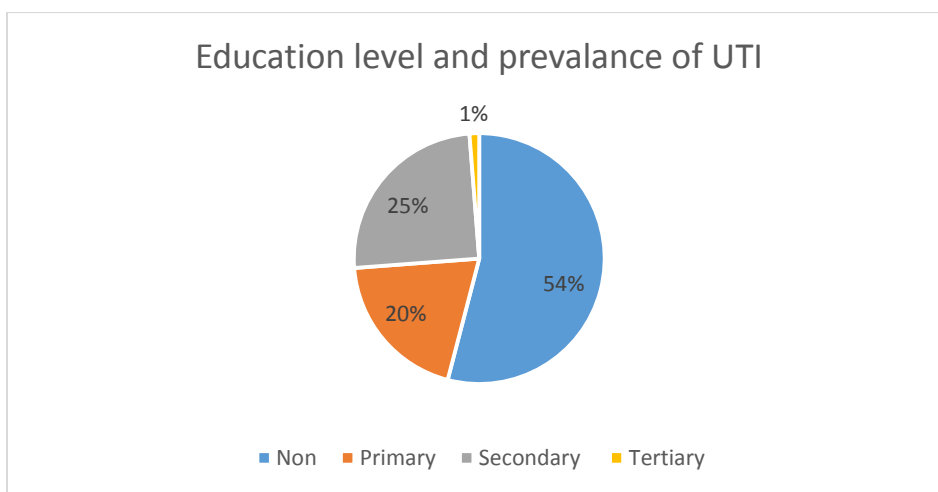


4.33 Education level and prevalence of urinary tract infections

Table 3: Education level and prevalence of urinary tract infections

Education level	Prevalence of urinary tract infection (%)
Non	52
Primary	19
Secondary	24
Tertiary	5

Figure 4: A pie chart showing education level and prevalence of UTI



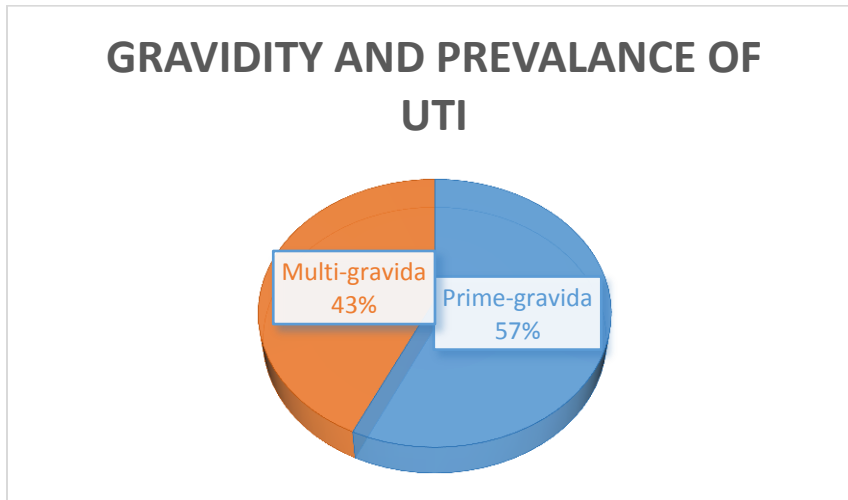
4.4 Obstetric factors and prevalence of urinary tract infections

4.41 Gravity and prevalence of urinary tract infections

Table 4: Gravity and prevalence of urinary tract infections

Gravity	Prevalence of urinary tract infection (%)
Prime-gravida	57
Multi-gravida	43

Figure 5: A pie chart showing gravity and prevalence of urinary tract infections

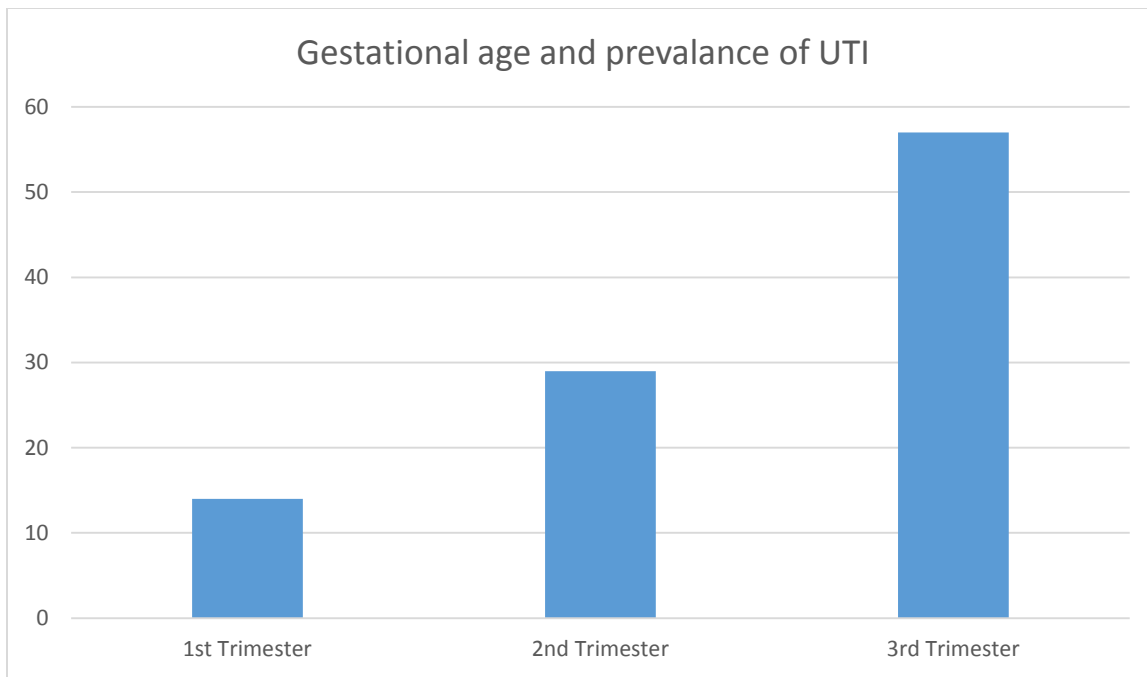


4.42 Gestational age and prevalence of urinary tract infections

Table 5: Showing gestational age and prevalence of urinary tract infections

Trimester	Prevalence of urinary tract infections (%)
1 st trimester	14
2 nd trimester	29
3 rd trimester	57

Figure 6: A graph showing gestational age and prevalence of urinary tract infections



4.5 Health related factors and prevalence of urinary tract infections

Table 6: Showing health related factors and prevalence of urinary tract infections

Health related factors	Prevalence of urinary tract infections (%)
Diabetes mellitus	0
Hypertension	0
HIV/AIDs	2
Kidney disease	0

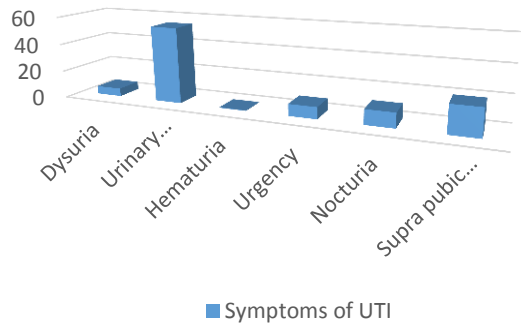
4.6 Symptomatology of urinary tract infections

Table 7: Showing the commonest symptom of urinary tract infection

Symptom	Percentage (%)
Dysuria	5.8
Urinary frequency (> 4 times in 1 hour)	54.7
Hematuria	0.3
Urgency	8.5
Nocturia	10.7
Supra-pubic pain	20

Figure 7: A graph showing the percentage occurrence of symptoms of UTI

Symptoms of UTI



CHAPTER FIVE

5.0 Discussion

Infection of the urinary tract (UTI) represents the most common medical complication of pregnancy and ranges from asymptomatic bacteriuria to pyelonephritis. Pregnant women are at greater risk of UTIs, particularly because of the physiologic and anatomic changes that occur in normal pregnancy. Physiological changes of pregnancy increase vulnerability to the development of urinary tract infections with the resulting maternal morbidity and poor fetal outcomes.

This study was conducted to determine the risk factors and prevalence of urinary tract infection among pregnant women admitted on maternity ward in Jinja Regional Referral Hospital.

A descriptive cross-sectional study was carried out on 150 pregnant women admitted on maternity ward in Jinja Regional Referral Hospital. Data were collected using the pre constructed tools through face to face interview.

Findings from this study showed that the prevalence of urinary tract infection was at 14% among pregnant women admitted on maternity ward in Jinja Regional Referral Hospital. Urinary tract infections occur more frequently in pregnant women because of the anatomical and physiologic changes that occur in the renal system during pregnancy. This result tallies with studies carried out by A.Masinde et al 2009 who reported prevalence of symptomatic and asymptomatic bacteriuria at 17.9% and 13.0% respectively.

On the other hand the prevalence was higher in Abakaliki Metropolis, Nigeria where nearly half of the pregnant women had a urinary tract infection, Z. Hamdan et al 2011. The difference in UTI prevalence during pregnancy could be due to variations in UTI perception, screening method, and confounding factors such as parity, age, and pregnancy.

Regarding symptoms of UTI, this study revealed that the most frequent symptoms were frequency of urination followed by supra-pubic pain, nocturia, urgency. Similar results were reported by Masinde et al. (2009) who found that frequency of urination and supra-pubic pain were among the most common symptoms of urinary tract infection among infected women in Tanzania.

While in contrast, Mohammad (2013) reported that the most common symptoms of urinary tract infection among infected women were dysuria and increased frequency of micturition followed by

supra-pubic pain. This could be due to the fact that increased frequency of urination is a common urinary symptom reported during normal pregnancy due to pregnancy changes in addition to the pathology of UTI, resulted in increased numbers of complaints about it.

Considering obstetric factors, urinary tract infections were more common among prime gravid mothers than in multiparous women. According to Kerure et al., (2013), urinary tract infection in pregnancy was more common among women with first pregnancies (53.85%) compared to multi-gravidae (46.15%). This study shows that nulliparous women are more susceptible to UTI compared to multiparous women. A study by Ajayiet al., (2012) in Nigeria also gave similar results (Care et al., 2016).

The prevalence of UTI increased with increase in gestational age. Similar results were reported by Length 2015. This could be due to any of the numerous anatomical and hormonal variations in pregnant women lead to urethral dilation and urinary inertia which increased changes of developing UTI (Bankole et al 2015)

Parity and gestational age considerably affect the prevalence of urinary tract infection. These have been previously reported in many studies (Halder et al., 2010).

Regarding age, urinary tract infections were more common among pregnant mothers between the ages of 20-30 years. Many studies considered advances in age a risk factor for getting UTI in pregnancy because there is decline in glycogen level, deposition and decrease in the Lactobacillus as part of the ageing progression which increases bacterial adherence and attack by pathogens and make them more vulnerable (Athira, 2016).

Regarding education level and socio-economic status, urinary tract infections were more common in pregnant mothers of low socio-economic status and who were uneducated. This findings agree with similar study by Mokube et al., 2013).

Lower levels of education and low socio-economic grade have correlation with higher prevalence of ASB in many studies and reports (Mokube et al., 2013). This is because education improves the attitudes and beliefs of women.

5.1 Limitations of the study

Limitations of the study were unavailability of data about blood group for all pregnant women, their Body mass index (BMI), generalization of the study findings in the institution and short duration of the study.

5.2 Recommendations

With regard to the findings of the current study, the researcher recommends:

- Provision of a health educational program about preventive measures of UTI for pregnant women.
- Periodical screening of pregnant women for early detection and proper treatment.

Further studies are recommended to assess:

- The relation between Dietary factors and UTI during pregnancy in Uganda using standard measures for dietary intake.
- The relation between family and genetic factors, using blood group, and UTI during pregnancy.
- The factors leading to recurrence of UTI in obstetric population.

5.3 Conclusion

Based on the above findings the study concluded that, UTI remain a prevalent problem during pregnancy especially, in developing countries. Genital hygiene, urination habits and low socioeconomic status play significant role in the occurrence of UTI during pregnancy. These findings could be attributed to lack of knowledge about UTI risk factors and its prevention during pregnancy.

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APPENDIX I: ESTIMATED BUDGET

ITEM	QUANTITY	COST PRICE	AMOUNT (Ug Shs)
Stationary			80,000
Typing		30,000	30,000
Photocopying		20,000	20,000
Binding		40,000	40,000
Research assistant		60,000	60,000
Miscellaneous			100,000
Total			330,000

APPENDIX II: WORK PLAN

Month	February	March	April	May	June	July	August	September	October
Task	2018	2018	2018	2018	2018	2018	2018	2018	2018
Concept development									
Proposal writing									
Proposal Approval									
Data collection									
Data analysis									
Report writing									
Submission of dissertation									

APPENDIX III: INFORMED CONSENT



Kampala international university western campus school of undergraduate studies, research and ethics committee

Study title: **Prevalence and associated risk factors of urinary tract infections in pregnant women admitted on maternity ward in Jinja regional referral hospital.**

Purpose: For partial fulfilment for the award of MBchB of KIU

Researcher: Edemaga Deogratus Candia (medical student).

You are requested to participate in this study. Please read the following information carefully before you decide whether or not to consent to participate. This consent form is composed of the following two parts:

Part I: Information sheet.

This part contains the information which will assist you to make the decision to either participate or not to participate.

Part II: consent form.

This part has provision which you can sign if you accept to give your consent to participate and get interviewed. If you do not agree to participate you are not supposed to sign.

PART I: INFORMATION SHEET

Purpose of the research.

This study is intended to determine the prevalence and risk factors associated with urinary tract infection among pregnant women admitted on maternity ward in JRRH so as to come up with current situation which will help in improving the management of UTI.

Participant selection.

We are selecting a total of **150** participants from this health facility (JRRH)

Procedure to be followed.

Taking part in this study is voluntary. If you agree to participate, you will answer some questions about pregnancy.

PART II: INFORMED CONSENT FORM

Research description

This is a study focusing on pregnant mothers admitted on maternity ward in JRRH in this facility. Its main aim is to assess how demographic factors (age, gravidity, gestation week, education level, socioeconomic status) affect the prevalence of urinary tract infection among pregnant women admitted on maternity ward in JRRH. This will help improve quality of pregnancy outcomes.

Risks

There will be no foreseeable risks to you since the study only involves interviews and information obtained will be kept confidential.

Benefits

You will benefit from this study in that medications will be prescribed for those who will have infections. The hospital administration will get the final report and be able to develop treatment protocol for prospective mothers.

Confidentiality and privacy

Privacy during interviewing and confidentiality of information are guaranteed. You will be interviewed separately from other clients. In case you know one of the researchers, you can be interviewed by someone else or withdraw from the study. You are not required to give your name so information cannot be traced back to you. The information collected will only be accessible to the Research team.

Compensation

No compensation will be available for your time and any inconvenience but we are very grateful to you for taking part in this study.

Contacts

If you have any questions now please feel free to ask me. In case you have any later on, you can contact the principal investigator, Edemaga Deogratius Candia on +256778191143 and edemagadeogratius@gmail.com

Voluntary

Participating in this study is voluntary. You have the right to refuse to take part and can withdraw at any point without any penalty.

Participation

Participant:

I have understood all the conditions above and have agreed to willingly take part in this study.

Signature/thumb print.....

Tel. number.....

Any other witness.....

Researcher / Research assistant's signature.....

APPENDIX IV: QUESTIONNAIRE

I am Edemaga Deogratus Candia, an undergraduate student of medicine and surgery at Kampala international university western campus. I am conducting a study about prevalence and risk factors associated with urinary tract infection among pregnant women admitted on maternity ward in Jinja Regional Referral Hospital. I am kindly requesting you to take part in this study by offering information to the questions below. All the information given will be kept confidential.

Please tick (✓) the appropriate answer applicable to you.

A. Demographic factors

1. How old are you?.....
2. What do you do for a living? (occupation)
 - i. Peasant farmer []
 - ii. Civil servant []
 - iii. House wife []
 - iv. Other, specify.....
3. What is your education level?
 - i. Non []
 - ii. Primary level []
 - iii. Secondary level []
 - iv. Tertiary level []

B. Obstetric factors

1. Gravidity
 - i. Prime gravida []
 - ii. Multi gravida []
2. How old is the current pregnancy?
 - i. LNMP.....
 - ii. WOA.....
3. Have you ever had any abortion/miscarriage?
 - i. Yes []
 - ii. No []
 - a) If yes, how many times?.....
 - b) At what month?

C. Health related factors

1. Do you have any of the following chronic illnesses?

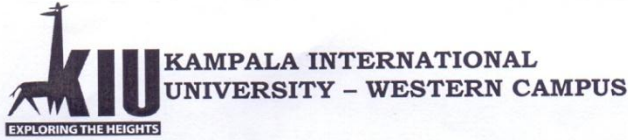
- i. Diabetes mellitus []
- ii. Hypertension []
- iii. HIV/AIDS []
- iv. Kidney disease []

D. Urinary symptoms (only tick if symptom is present)

- i. Painful urination (dysuria) []
- ii. Increased urine frequency (at least > 4 times in an hour) []
- iii. Hematuria (blood in urine) []
- iv. Urgency []
- v. Nocturia []
- vi. Supra pubic pain []

Thanks for your time.

APPENDIX V: INTRODUCTION LETTER



**KAMPALA INTERNATIONAL
UNIVERSITY – WESTERN CAMPUS**

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**OFFICE OF THE DEAN
FACULTY OF CLINICAL MEDICINE & DENTISTRY**

16/07/2018

TO WHOM IT MAY CONCERN

RE: EDEMAGA DEOGRATIUS CANDIA (BMS/0039/133/DU)

The above named person is a fifth year student at Kampala International University pursuing a Bachelor of Medicine, Bachelor of Surgery (MBChB) Programme.

He wishes to conduct her student research in your community

Topic: Prevalence and risk factors associated with urinary tract infections in pregnant women admitted on maternity ward in Jinja Regional Referral hospital

Supervisor: Dr. Nyolia James

Any assistance given will be appreciated.

Yours Sincerely,

**Dr. Akib Surat O
Deputy Executive Director/Assoc Dean (FCM & D)**



“Exploring the Heights”

Assoc. Prof Ssebuufu Robinson, Dean (FCM & D) 0772 507248 email: rssebuufu@gmail.com
Dr. Akib Surat Associate Dean FCM & D) email: doctorakib@yahoo.com

APPENDIX VI: MAP OF JINJA



